

Article

Understanding and Predicting Students' Entrepreneurial Intention through Business Simulation Games: A Perspective of COVID-19

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Abstract: COVID-19 has disrupted educational institutes across the world. Teachers and students are now forced to teach and study online for an unidentified period, which severely hampers the learning capacity as well the student's intention toward entrepreneurship. This study compared the impact of traditional teaching and teaching through online management simulation games on student learning performance and further leads to entrepreneurial intention. To further understand the desirability of business simulation games, we used the technology acceptance model (TAM) and extended it by employing knowledge sharing, knowledge application, learnability, perceived pleasure, and self-efficacy as exogenous variables. For this purpose, time-lagged data were collected from 277 students enrolled in entrepreneurship courses in public sector universities. To deal with homogeneity and generalizability issues, students from different collaborative universities were asked to participate in the study. Structural equation modeling was employed for analysis, where the results depict that the students learning performance was enhanced after using simulation games compared to regular theoretical online lectures, which further encouraged them to be entrepreneurs. We also concluded that simulation games are novel and effective online teaching methodology for students during a time of crisis. The study concludes with its theoretical, practical implications, and directions for future researchers.

Keywords: business simulation games; technology acceptance model; learnability; knowledge application; learning performance; entrepreneurial intention

1. Introduction

With lockdown due to pandemic spread around the globe, the rate of unemployment is becoming high among the youth due to unstable economic conditions; however, the rate of unemployment can be reduced by encouraging the youth to indulge in entrepreneurial activities [1]. Entrepreneurs are always looking for new ideas and ways to implement them to promote economic and development activities in the country. At the same time, however, it is challenging for youth to develop enough capabilities to assist and support them toward entrepreneurial activities. In today's dynamic environment, students need to develop abilities and skills following the environmental changes and upcoming challenges. In this regard, the main source of education in terms of management and entrepreneurship are business schools and related institutes. However, these schools and institutes have failed to provide practical knowledge, which is why they are facing heavy criticism due

to focusing more on theoretical and academic knowledge [2]. Around the globe, the educational system is still very traditional, following a lecture-based approach to teaching, deep-seated routed institutional biases, and traditional classrooms [3]. However, COVID-19 has forced universities to adopt online classes to deliver lectures. In this regard, most of universities have adopted online classes to teach students by using different learning tools such as Google Classroom, Microsoft Teams, and Zoom as well as YouTube [4,5]. However, universities have adopted the online teaching method at haste, without keeping in mind the quality of education at a mass level. According to researchers [6], online teaching has been introduced over the last 20 years in higher education, which particularly in entrepreneurship education is not new, but it has failed to gain worldwide adoption because the essence of entrepreneurial education demands the need for deliberate practice, real-world engagement, and experiential approaches [7,8]. Furthermore, it is evident that business education, particularly entrepreneurship, is going to be very different in the coming future [9]. This scenario not only becomes a unique challenge, but also brings potential opportunities for entrepreneurship education. Entrepreneurship education is an important aspect of business education as it covers all the basics and concepts of other business courses. There are two basic needs for entrepreneurship course: (1) Entrepreneurship basics and concept, and (2) entrepreneurial mindset and competencies. Entrepreneurial basics and concepts can be taught through the traditional online teaching approach but to teach entrepreneurial mindset and competencies, there is a need to adopt a novel (business simulation games) online teaching approach. It is indispensable to introduce new teaching methods and techniques, particularly in entrepreneurship education, in order to stabilize the world economy and the management of every business in the future [10]. This study is an effort to explore whether the online traditional mode of teaching is effective for student learning or the online novel (business simulation games) teaching technique, particularly in an entrepreneurship course.

1.1. Business Simulation Games and Their Benefits

According to Gabrielsson, Tell, and Politis [2], business schools and policymakers are facing heavy criticism because of the burdening of students with theoretical and academic knowledge instead of providing them with knowledge that is close to practical. Even before the COVID-19 pandemic, several researchers [11,12] and practitioners [13,14] have criticized the management theories and courses taught by business schools. For example, they seldom provide students with practical knowledge that they can apply in the real world. Business education is considered to be highly practical, and it is not possible, from an instructor's perspective, to provide complete knowledge related to business education through online mediums of instruction. This is why it is necessary to revamp online education and change it toward a more flexible yet innovative mode of instruction [15]. In the case of entrepreneurship, learners need to understand and gain more knowledge about practical situations and how to overcome these problems. Online and traditional teaching techniques include lectures, videos, notes, case studies, and lots of discussions that provide insight into the theoretical knowledge to the students. Still, it seldom gives them real-world experience and practical knowledge. Therefore, it is time to adopt new technology in our educational systems following the current generation's desired behavior and practices. According to AbouRizk [16], students learn more if they learn from experimental and practical knowledge instead of sitting and listening to lectures in a classroom environment. Business simulation games provide an interactive, exciting, and joyful environment for the students to learn [17,18], and also help them choose future careers [19]. These games are also known as economic simulation games as the primary objective of the games is to focus on the economic process of the business. In business education, these games are used in the disciplines of accounting, management, product development, marketing, economics, and entrepreneurs [7,20].

According to Mawhirter and Garofalo [21], technical and decisive thinking skills can be boosted by providing students with a healthy learning environment. They can build a

connection between the hypothetical and realistic information through simulation games. Furthermore, the inclusion of simulation games in online teaching can bring useful, productive, and greater results [22]. Business simulation games are a practical way of learning about business challenges and how to overcome those challenges in a risk-free environment. Previous literature and researchers have endorsed views that business simulation game motivation [23] can enhance critical experimental thinking and learning [19,24], time management [24], and teamwork and collaborative learning [19,23]. Vanevenhoven and Liguori [25], and Zhang [26] hold the view that entrepreneurial knowledge, skills, and activities are complicated not only at this critical time, but also in the natural environment. Therefore, it is important to acquire these skills and competencies. These skills and competencies can be gained and enhanced using business simulation games [27]. According to Kriz and Auchter [28], the German Ministry of Economics and Technology admire the importance of business simulation games, particularly in the field of entrepreneurship. They examined the results of their longitudinal study of EXIST prime cups from 2012 to 2014 where business simulation games had a positive and constructive impact on the students' learning behavior toward entrepreneurship.

1.2. Game Design

The game was based upon a comprehensive analytical situation, which provides a broader picture to the students regarding the market, competition, and other stakeholders. The figure in the Appendix A offers a detailed insight regarding the mechanism of this online business simulation game. Students were required to interact with the system dynamic simulation model in the simulation game, which is based upon decades of research relevant to product development, human resource dynamics, market structure, marketing policies, competition analysis, and numerous other factors [29,30]. All participants were informed about the essential characteristics of the games (see Table 1).

Table 1. Based on the literature characteristics of business simulation games.

Characteristics of Business Simulation Games (BSG)	Explanation	References
Clear Goals	Goals are very clearly defined to players	[31]
Time Constraint	Games is for the limited period	[32]
Limited resources	Players of the games have limited financing to start the game	[33]
Participative	Players need to actively participate	[25]
Interactive	Collaboration with all team members is an essential part	[31]
Inductive	Decision-based on the logics and reasons	[33]
Explorative	Consider all the flaws and objections and then make a decision	[34]
Reflective	Be judgmental while making the decision	[34]

1.3. Purpose of the Study

The paper aimed to examine the impact on the students' learning performance and intention toward entrepreneurial ventures after indulging in business simulation games, incorporating the technology acceptance model. Based on the theory, five constructs (knowledge sharing, knowledge application, perceived usefulness, perceived pleasure, self-efficacy, perceived ease of use, adoption) were used with the goal that students, at home, studying online could develop a deeper understanding of the entrepreneurial concepts. This paper also provides important implications for educational scholars and students who want to start new businesses. Values associated with business simulation games assist in developing an understanding of the business processes as well as in developing innovative skills, motivational abilities, and meaningful tasks. During the COVID-19 pandemic, students have been taking online classes from which they can only learn about theory.

Therefore, simulation games are useful for students to boost their learning performance by building an attitude that can lead to developing entrepreneurial intention in a convenient and pleasurable learning environment. During their study, Solomon and Fernald [35] suggest that theoretical and practical knowledge can be more beneficial to shape positive entrepreneurial intentions.

2. Research Model and Theory and Hypotheses Building

2.1. Research Model and Theory

The technology acceptance model (TAM) was used for this study, which is derived from the theory of reasoned action by Ajzen and M. Fishbein [4], as it illustrates and explains the behavior of the user after the adoption of new technology. TAM has two primary exogenous constructs: perceived ease of use and perceived usefulness. Researchers have applied TAM in their studies to check the entrepreneurial intention of consumers toward the use of some new technology [35,36]. Chen [37], Sukkar and Hasan [38], Aldás-Manzano, Lassala-Navarré, Ruiz-Mafé, and Sanz-Blas [8] examined TAM and its relevance in measuring the students' intention toward technology adoption. They also proposed modifications and extensions in the model. In this study, we extended the TAM model by adding the predicted variables, which improved the student learning performance by adopting business simulation games. These predicted variables included knowledge management (knowledge sharing, learnability, and knowledge application) self-efficacy, and perceived enjoyment. However, after reviewing the literature, few studies were found that examined and investigated the adoption of business simulation games for entrepreneurial learning using this modified TAM. Arpaci [19] extended the TAM by employing knowledge management practice constructs to measure the student's intention toward technology adoption. Similarly, TAM was extended and modified to measure the adoption of learning management system in accessing online study material [39,40]. Zulfiqar, Sarwar, Aziz, Chandia, and Khan [41] modified TAM by adding perceived pleasure to measure the adoption of business simulation games and intention of the students' entrepreneurship. Sanchez and Hueros [42] extended TAM to measure student technology adoption behavior by employing self-efficacy and technical support variables. Given the extensive literature on perceived usefulness and its role in developing entrepreneurial intention toward using a particular technology, like game adoption, which we took in our study, we examined the relationship between knowledge sharing, learnability, self-efficacy, and fun to play and explored these by linking it with the TAM model and identifying the effect of these variables on business simulation game adoption and the learning performance of students [41]. This relationship can be seen in Figure 1.

2.2. Learnability

Learnability is a vital factor in knowledge management practices, and it is defined as the ability of an individual to learn while resolving complex and difficult tasks [43]. With the advancement of technology, the demands of quality education for teachers and students are increasing, and learnability has gained more importance [44,45]. Learnability is greatly improved with the usage of mobile devices as individuals' tend to be involved and engage more in using mobile devices for their learning rather than old traditional methods as they consider mobile devices as a part of their daily routine [46]. Researchers have argued that mobile learning tends to be a more flexible learning tool and can be considered as the extension of online learning as it expands the scope of education [47,48]. Although most universities use traditional learning methods, there are also many online courses via the Internet with the use of digital media and platforms. These methods are used for learning experiences, which now tend to be more interactive and engaging tools that enhance the learnability of students [36,49]. Learnability is an integral part of developing an individual's entrepreneurial intention because it motivates us to learn something new and introduce something unique to the world. Therefore,

Hypothesis H1(a). *In the case of online classes, learnability is positively associated with usefulness.*

Hypothesis H1(b). *In the case of business simulation games, learnability is positively associated with usefulness.*

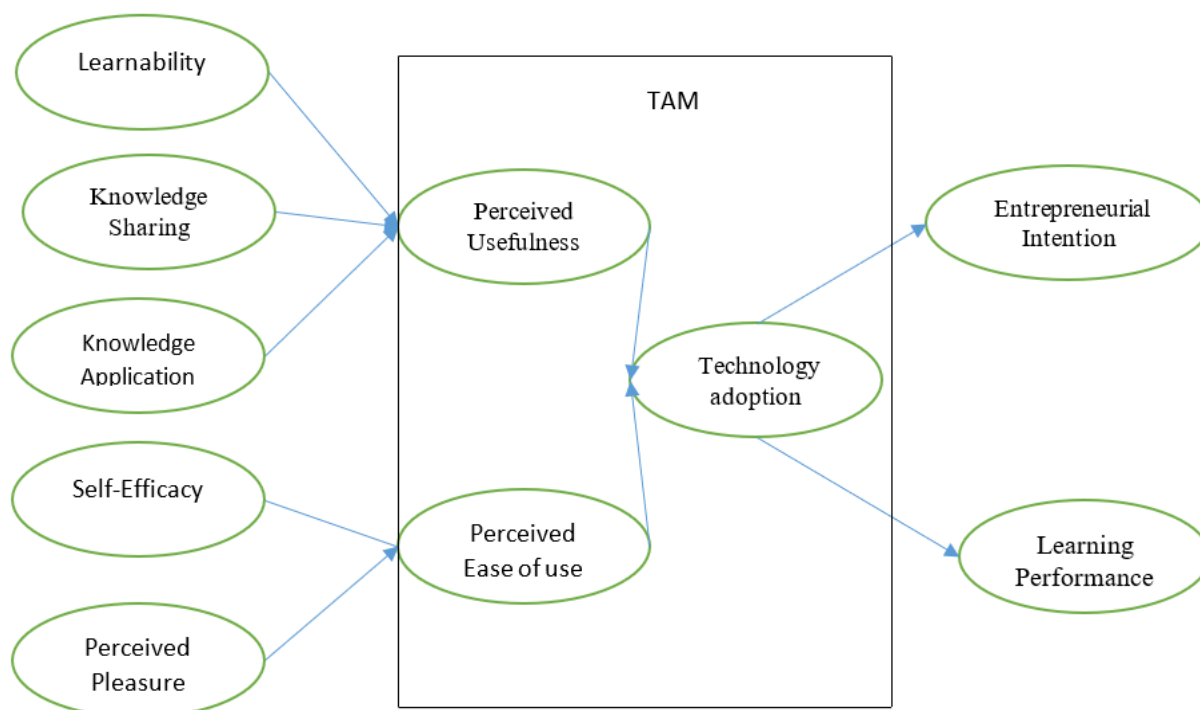


Figure 1. Hypothesized model based on the literature review.

2.3. Knowledge Sharing

According to Lee [50], knowledge sharing is the ability of an individual to exchange his thoughts, experiences, ideas, information, and solution with their colleagues and class fellows. Knowledge sharing is considered a valuable source of obtaining knowledge and information as it increases an individual's knowledge [51]. Knowledge not only enhances the individual's performance, but also tends to improve the overall organization performance as the success of any organization is dependent upon its knowledge management and sharing of knowledge for its long-term sustainability and competitive advantage [51,52]. However, with the advancement of IT and social networking platforms, it helps individuals to disseminate and share information, ideas, and opinions with others due to the popularity and increased usage of these social networking sites, which enhances the circle of people sharing knowledge from anywhere in the world through Facebook, Twitter, Instagram, and WhatsApp, etc. [49,50]. Additionally, it allows someone seeking information to post a question regarding a topic on any of the blogs or social media platforms, and for someone with the relevant knowledge or domain to answer the question without expecting any tangible reward or monetary benefits [49,52]. Knowledge is critical in developing a person's learning performance because if a person knows about a particular concept, they can conceive some ideas about it [35,51]. Given the above literature, these days, it can be explained that knowledge sharing is effortless and useful with the help of these platforms, which makes students more knowledgeable and can enhance their performance because of the knowledge available concerning every field on the Internet. Therefore,

Hypothesis H2(a). *In the case of online classes, knowledge sharing is positively associated with usefulness.*

Hypothesis H2(b). *In the case of business simulation games, knowledge sharing is positively associated with usefulness.*

2.4. Knowledge Application

According to Hamdoun, Jabbour, and Othman [53], knowledge application is the fundamental factor that facilitates the innovation and performance of individuals. The main purpose of knowledge application is to integrate the information from internal and external sources and translate it to obtain a new knowledge asset [54]. Knowledge embedded in the applications is its competitive edge rather than itself. The use of technology in the educational sector dramatically changes traditional teaching methods and improves the students' learning performance. The use of technology increases the individual's efficacy of knowledge through easy access to information required. Ode and Ayavoo [55] examined whether mobile device application significantly improved the learning performance of the students. Cheung and Slavin [56] investigated mathematics students who used an educational application in the classroom that improved learning performance compared to the students who undertook lectures. Auchter and Kriz [57] examined the results of their longitudinal study of EXIST prime cups from 2012 to 2014 where business simulation games had a positive and constructive impact on the students' learning behavior toward entrepreneurship. Digital computer-based learning has been observed as a learning tool that optimizes the learning process with interrelated principles of challenges of the situation and develops skills, engagement, and immersion [49,53]. Researchers have also described that the development of mobile devices and laptops has enhanced the opportunities for individuals to learn from anywhere in the world, at any place, and at any time with the use of these devices [33,57]. Therefore,

Hypothesis H3(a). *In the case of online classes, knowledge application is positively associated with usefulness.*

Hypothesis H3(b). *In the case of business simulation games, knowledge application is positively associated with usefulness.*

2.5. Self-Efficacy

Self-efficacy is the belief of self-ability to achieve something or apply a significant action to achieve some goal or result [35,58]. Self-efficacy is also stated as an attitude to begin, do, or complete the tasks or jobs being confronted [48]. According to the literature, it can be suggested that self-efficacy is a good predictor of entrepreneurial intention and a strong predictor of business performance [59]. From the perspective of personal being, self-efficacy is related to self-confidence and plays a vital role in enhancing an individual's entrepreneurial interest. It makes sense because if someone does not believe in their skills, they have very little chance of being an entrepreneur. Self-efficacy is ascertained to mediate the influence of the students' entrepreneurial intentions and their knowledge variables toward significant positive entrepreneurial readiness and the personality of an individual [48,60]. Individuals with high expectations of self-efficacy (that they will be successful in their work), however, realistic results are based on the capabilities and consistency of that person until they are a success. Having high self-efficacy means that a person is expected to defeat each challenge and risk and is the opposite in the case of low self-efficacy, where people tend to avoid hard issues and do not risk anything. Yukselturk and Altioek [61] stated that the rise in information technologies has raised the self-efficacy level of students and teachers to a great extent by introducing programming, computational thinking, and developing positive attitudes toward advances in technological adoption in the future in every field. Therefore,

Hypothesis H4(a). *In the case of online classes, self-efficacy is positively associated with the perceived ease of use.*

Hypothesis H4(b). *In the case of business simulation games, self-efficacy is positively associated with the perceived ease of use.*

2.6. Perceived Pleasure

Perceived pleasure is “the degree to which the activity of using technology is perceived to be enjoyed in its own right apart from any performance consequences that may be anticipated” [62,63]. Choi [46] defined entertainment “as a storytelling technique that can be used in education to capture students’ interest and attention”. Today, the advancement of technology in every field of life has transformed the traditional method of learning to digital ways of learning that help students improve their learning process. Specifically, in the context of higher education, it has become a strategy to use these simulations and games for learning purposes as it provides entertainment to students and they are involved more in these types of learning activities rather than traditional learning [64,65]. Researchers have also referred to the use of social networking sites in the context of entertainment purposes for students as they use them for communication and collaboration and share information [65–67]. They argued that such social networking sites enable students to communicate with their peers and to adapt to the social context of learning by creating a collaborative learning environment [68]. Therefore, the research suggests that a promising way to engage someone in a meaningful learning activity is through providing entertainment such as video games and simulations to create more interest in students toward learning [69–71]. Therefore,

Hypothesis H5(a). *In the case of online classes, perceived pleasure is positively associated with the perceived ease of use.*

Hypothesis H5(b). *In the case of business simulation games, perceived Pleasure is positively associated with perceived ease of use.*

2.7. Perceived Usefulness

TAM has become a powerful model for predicting the users’ intentions and acceptance of new technology or products or services. Perceived usefulness has always been a strong determinant of the usage intention of consumers toward a particular service [72]. Perceived usefulness is defined as “the degree to which a person believes that using a particular system may enhance his or her job performance” [73,74]. Perceived usefulness is the likelihood that new technology will increase the productivity or performance of an individual or consumers using it. Perceived usefulness has always been considered the central part of any information communication technology or any new product or service as it is based on the benefits associated with that technology and describes the usefulness of adopting particular technology [75–77]. An individual will use a particular technology or service if they find it useful and will increase their performance and productivity [49,78]. There is much recognition that perceived usefulness increases the likelihood of the acceptance of new technology [79]. An individual tends to use a new product or service if they find it useful and if it is a strong predictor of increasing their performance, then they could make an intention toward using that product or service [64,80]. One can presume the benefits associated with certain technology then his attitude and intention towards that technology will be quite positive [81,82]. Previous research suggests that consumers adopt new technology not only for their functional reasons, but also for emotional satisfaction or social attachment including experiences, ease of use, and perceived enjoyment related to the use of that technology [83–85]. Therefore,

Hypothesis H6(a). *In the case of online classes, perceived usefulness is positively associated with the adoption of online classes during COVID-19.*

Hypothesis H6(b). *In the case of business simulation games, perceived usefulness is positively associated with the adoption of games during COVID-19.*

2.8. Perceived Ease of Use

Davis [49] believed that if the user has to put little effort toward using certain technology and gets the desired result, it will positively influence their intention toward using that technology [86]. Perceived ease of use has been found in almost all studies of information systems as well as the adoption of new technology, and always showed positive results [87,88]. Perceived ease of use is considered as the primary factor of users in using a particular technology because users always want ease of use in their work and also get the desired results. Technology tends to do this for them. Several studies have shown that perceived ease of use makes the acceptance of particular technology and directly affects the consumers' behavioral intention toward using that technology [88–90]. Furthermore, research has also suggested that perceived ease of use also has a direct influence on perceived usefulness [91,92]. Its main aim is to motivate and create student interest in using technology for their educational purposes. TAM posits that information technology is perceived to be useful as well as less effort to use that technology [74,93]. A business simulation environment tends to provide flexibility in decision-making and strategic mindset, which will influence the intention of youth in using this technology to better utilize it for their good. Therefore,

Hypothesis H7(a). *In the case of online classes, perceived ease of use is positively associated with the adoption of online classes during COVID-19.*

Hypothesis H7(b). *In the case of business simulation games, perceived ease of use is positively associated with the adoption of games during COVID-19.*

2.9. Business Simulation and Learning Performance

Constructivist learning theory [76,82,94] is the basis of designing simulation-based learning, as these games help the user to learn and construct new knowledge. These games are rich in information and knowledge and allow users to brainstorm, analyze the situations, think critically, discuss, evaluate, and then make a decision in a risk-free environment [95]. There are a set of rules and regulations for business simulation games, and instructors can change the scenarios with time, which gives the essence of working in a real situation [96–98]. Learning through business simulation games is based on theoretical knowledge and application, which assist students in connecting theory with real situations, resulting in higher learning performance. Mawhirter and Garofalo [21] showed that simulation games were fun to play, interactive, creative, and innovative ways to enhance student learning. In the business literature, business simulation games and systems are considered very important for the learning progress of students as they tend to create entrepreneurial intentions in them [81,99]. Game-based education and simulation systems can enhance the learning process of students as students learn better by being involved in practical education rather than the theoretical process of learning [82,100]. Moreover, by introducing such novel simulation systems in our education, it can change the attitude, behavior, and intention of students toward education and create entrepreneurial intentions in them [101–103]. According to Popil and Dillard-Thompson [104], simulation-based education helps students retain and memorize concepts and terminologies, which help students reduce stress. Additionally, the literature suggests that classroom learning is positively influenced by game-play in the case of business students [83,105,106]. Therefore, based on the above-detailed literature, we propose a hypothesized model.

Hypothesis (H8). *Business simulation games adoption can increase the learning performance of the students.*

2.10. Entrepreneurial Intention

Venture creation is termed as the heart of entrepreneurship. To understand venture creation, we must understand the role of individuals and enterprising groups. Venture creation is defined as the organizing, planning, and establishing of new ventures or organizations and has been an important topic for discussion in entrepreneurship studies [77,80,107]. It has also been closely related to entrepreneurship and has been considered as the central part of entrepreneurship relating to the creation of an organization. Those who create an organization are entrepreneurs, and those who do not and do not have entrepreneurial intention are considered as non-entrepreneurs. The phenomena of venture creation involve individuals and the environment and interaction between them [108,109]. Furthermore, developing an understanding between environment and behavior is the key to creating an intent towards when and how to exploit entrepreneurial opportunities [110,111]. Researchers suggest that the process of starting a new venture begins with an individual developing an intent and if its notion is consistent with the placement of its constructor model, which then precedes them toward the search and discovery of opportunities to ultimately start a new business or venture [80,112,113]. Once an entrepreneurial intention is formed, then an individual starts to look for opportunities to start a new venture and if it is somewhat misleading and opportunities are not found or discovered, then the entrepreneur has to imagine the likelihood of the market value of their product or service in the future [80,114]. In the management literature, game-based learning is considered very important in developing entrepreneurial intentions for students [77,115,116]. Game-based education and simulation systems can enhance the learning process of students [21,77,117]. Moreover, by introducing such systems in our management and education, it can change the attitude, behavior, and intention of students and develop entrepreneurial intentions in them [118]. The literature also suggests that classroom learning is positively influenced by involving game-play in the classrooms as students prefer to put more effort into practical learning rather than theoretical learning [86,119–121]. This practical involvement with their study helps students in developing entrepreneurial intentions and be more creative in their approach [87,122,123]. Therefore, it is important to make the intention of students toward practical implication of their entrepreneurship education and turn toward venture creation, which is linked with the quality of education and training as well as the opportunities provided to them to exploit the best of their abilities and ideas [80,124,125]. Based on the above literature, the following hypothesis was developed.

Hypothesis (H9). *Business simulation adoption has a significant relationship with student entrepreneurial intention.*

3. Research Methodology and Data Collection

The empirical study was designed not only to know whether students liked simulation games, but also to determine whether these games could assist students in learning by building the link between theoretical and practical world knowledge, especially in the present scenario of the pandemic. A study conducted on a single organization or homogeneous sample may cause generalizability of the results and findings [126,127]. Therefore, to deal with these issues, data were collected from HEC (Higher Education Commission) recognized universities that have management sciences departments in the two major cities of Pakistan, which were Lahore and Sahiwal. Both cities host many public and private universities. As COVID-19 spreads, there has been a complete shutdown all over the globe, which has also impacted educational institutes, and students are voluntarily or involuntarily taking online lectures [128,129]. As it currently is difficult to contact students, questionnaires were distributed among the instructors who were teaching courses of entrepreneurship. We were able to gain access to the instructors using our professional and personal contacts. With the assistance of these instructors, we were able to access students. A cover letter with all the guidelines was given to the instructors, which stated the purpose and scope of the study along with the assurance that the respondents' information and data

would remain confidential and would not be shared under any circumstances. A major concern while conducting cross-sectional research employing person-focused constructs is reverse causality and method bias. At the same time, social influence may impact the behavior of the respondents. A time-lagged multi-waves technique was used to collect the data from students as suggested by [130–132] to solve the issue. The two waves of data collection were separated by at least one month and fifteen days. In total, twelve theoretical lectures were delivered by the instructor using an online platform of Microsoft Teams and Zoom. In the second wave, business simulation games were introduced, where students were first briefed on the simulation games and situations that they needed to cater to using their theoretical knowledge base. This time-lagged method allowed respondents to understand the situation thoroughly and respond. The game used for this kind of experiment was introduced by the MIT (Massachusetts Institute of Technology) Sloan School of Management. When it comes to action-based learning and creating real-world applications of classroom knowledge, MIT Sloan is a pioneer. Business simulation games are the latest and modern applications. These innovative and interactive games create a computer-generated world in which students explore and participate in critical management issues faced by entrepreneurs and organizations during their operation. The objective of this game is to let management students familiarize themselves with the challenges of building a startup venture while analyzing the demanding competitive environment including human resources, financial, strategic, and other management decisions. All measures are in English. A 7-point Likert scale was used for value addition to give students feedback without hindrances and limitations. The scale ranged from 7—strongly agree, 5—somewhat agree, 3—somewhat disagree, and 1—strongly disagree. To ensure the content and face validity of the instrument, extension literature was reviewed. The primary quantitative study was conducted through the close-ended questionnaire survey, which was translated into English only, as it is the second official language of Pakistan. The intention to keep the questionnaire in English was to keep the validity of the instrument consistent in terms of linguistic and psychological views. Fifteen education experts and 10 students were contacted to review the instrument before conducting a survey. This procedure helped in verifying the instrument. The author's objective and the focused definition of the constructs were shared with each of the committee members during this phase. Furthermore, a pilot study was conducted using online survey techniques in Google Docs and Microsoft Teams; in total, 30 questionnaires were sent to students of collaborative universities out of which the feedback of 25 students were received. To improve content validity, students were requested to review the wording, length of the queries, and to highlight the chances of improvement in any of the main constructs. Feedback and suggestions from experts were incorporated into the questionnaire. The complete detail of the questions asked is given in Appendix B.

3.1. Measurements

All measures were in the English language as the mode of communication in universities and offices in Pakistan is English. Participants of this study were all university students, which is why language comprehension was not an issue. A 7-point Likert scale was used for value addition so that students could give feedback without any hindrance and limitation. The scale ranged from 7—strongly agree, 3—somewhat agree, 5—somewhat disagree, and 7—strongly disagree. To ensure the content and face validity of the instrument, extension literature was reviewed.

3.1.1. Learnability

We used a five item scale to measure learnability by [128,129], which are currently used instruments in measuring knowledge management practices. The sample items included "Experience is needed to perform the work while using business simulation games" and "Simulation games take a lot of time to learn how to perform the work". The Cronbach's

alpha values were 0.989. Convergent validity was also proven as all items loaded in a range of 0.808 to 0.823 with an average variance extracted (AVE) = 0.951, respectively.

3.1.2. Perceived Ease of Use and Perceived Usefulness

We used five and three item scales to measure perceived usefulness (PU) and perceived ease of use (PEOU) by [49,133], which are instruments already used in as measurements in technology adoption research. The sample items included “My interaction with simulation games is clear and understandable”, “It is easy to become skillful at using simulation games”, “Using simulation games increase my productivity in my coursework”, and “Using simulation games enables me to improve my learning performance”, respectively. The Cronbach’s alpha values were 0.972 and 0.967. Convergent validity was also proven as all items loaded in a range of 0.707 to 0.810 with an average variance extracted (AVE) = 0.920 and 0.884, respectively.

3.1.3. Knowledge Application and Knowledge Sharing

We used four and three item scales to measure knowledge application and knowledge sharing, respectively [128,129], which are already used instruments in measuring knowledge management practices. The sample items included “Past experiences and knowledge of simulation games help to tackle academic problems”, “Past experiences and knowledge of simulation games should be employed in problem-solving”, and “The knowledge shared by teachers and class-fellows while playing games is relevant to the topics”, and “The knowledge shared by teachers and class-fellows over while playing games is easy to understand”. The Cronbach’s alpha values were 0.977 and 0.981. Convergent validity was also proven as all items loaded in a range of 0.775 to 0.861 with an average variance extracted (AVE) = 0.895 and 0.915, respectively.

3.1.4. Self-Efficacy and Perceived Enjoyment

We used three and three item scales to measure self-efficacy and perceived enjoyment [134,135], which are already used as instruments in measuring the intention to adopt the technology. The sample items included “I have the knowledge necessary to use the simulation games”, “I have skills necessary to use the simulation games”, “I find using the simulation games to be enjoyable for fulfilling my academics needs”, and “I have fun playing the simulation games”. The Cronbach’s alpha values were 0.976 and 0.955. Convergent validity was also proven as all items loaded in a range of 0.693 to 0.888 with an average variance extracted (AVE) = 0.931 and 0.878, respectively.

3.1.5. Technology Adoption and Learning Performance

We used three and three item scales to measure technology adoption and learning performance by [136] and [137,138], respectively, which are already used as instruments in measuring technology adoption and the learning performance of its users. The sample items included “I plan to use business simulation games to manage my education-related learning”, “I predict that I will continue to use simulation games for educational purposes”, “I feel competent in completing my academic tasks”, and “I have learned how to do my task compilation efficiently”. The Cronbach’s alpha values were 0.973 and 0.961. Convergent validity was also proven as all items loaded in a range of 0.674 to 0.752 with an average variance extracted (AVE) = 0.892 and 0.926, respectively.

3.1.6. Entrepreneurial Intention

The 3-item scale for measuring the entrepreneurial intention of students was adapted from [139]. The sample items of this scale include “I am ready to do anything to be an entrepreneur” and “My professional goal is to become an entrepreneur”. The Cronbach’s alpha value of this scale was 0.899 with an AVE of 0.733.

Before the study, a developed questionnaire was sent for review and useful comments to three experts that include two educationists and departmental heads. Feedback and

suggestions from experts were incorporated into the questionnaire. Furthermore, a pilot study was conducted using the online survey techniques of Google Docs and Survey Monkey, where in total, 30 questionnaires were sent to students out of which feedback from 25 students were received, and none of the students reported any confusion while answering the questions.

4. Results and Data Analysis

A total sample of 300 questionnaires was distributed among the students taking entrepreneurship courses and had an idea regarding business simulation games. For this study, the time-lagged multi-waves technique was used in 1st time-lag data, which was held on 2 July 2020. A total of 300 students participated, of which we received 289 fully completed questionnaires with a response rate of 96.33%. In period two, which was on 13 August 2020, after using business simulation games, the same survey was distributed among the same 300 students, out of which 277 questionnaires were filled with a response rate of 92.33%. Participants who were part of this study included both males and females. The majority of participants were male students with 67.5% compared to the female participants with 32.5%. Moreover, the average age range of the students was 22–24 years (Table 2).

Table 2. Demographics of the respondents.

Demographics	Items	Time Lag 1 2 July 2020	Time Lag 2 13 August 2020
Gender	Male	65%	67.5%
	Female	35%	32.5%
Age	20–22	9%	13%
	22–24	91%	87%
Education	Under Graduate	96.33	92.33
Total		289	277

Based on the hypothesized framework and hypothesis proposed above, a structural equation model (SEM) was employed using analysis of moment structures (AMOS 24) to establish a model and data analysis. Before conducting the analysis, several tests were conducted to check the issue of missing value, normality, and wrong coding. The multi-collinearity issue was performed by assessing the VIF (Variance Inflation Factor) value, which was less than 10. For the statistical analysis, we did not find any problems. Non-response bias was examined by comparing the reactions of the first 40 and last 40 respondents. T-test results depict the insignificant difference ($p > 0.05$) between the groups. Therefore, this study was not influenced by non-response bias. Furthermore, common method bias (CMB) was analyzed using three approaches [138]. First, the Harman single factor was examined by employing exploratory factor analysis (EFA), where a single factor showed only 15.4% of the variance, which was less than the threshold value of 50%, accounting for all items of the study. Second, bias was measured by linking CBM with a common latent factor (CLF) approach using AMOS. The results depict that there was no significant loss in the factor loading of items. Thus, both outcomes show CBM was not an issue in this study.

Reliability and Validity

The reliability and validity of the constructs were tested before analyzing the measurement model. Cronbach alpha (α) and (CR) values were assessed to confirm the reliability of the constructs. The values of the CR and α both ranged from 0.956 to 0.990 and 0.955 to 0.989, respectively. Hence, this was proof of the good reliability of the construct according to [119–122]. We examined the convergent validities to measure the validity of the con-

structs. Convergent validity was evaluated by examining the factor loading (FL) and AVE, where the value of FL ranged from 0.693 to 0.888, which was greater than the benchmark value (i.e., 70) [95]. Meanwhile, the AVE of the constructs ranged from 0.878 to 0.931, which was greater than the standard defined [122]. The results demonstrated the convergent validity of the model (Table 3).

Table 3. Factor loading (FL), average variance extracted (AVE), composite reliability (CR), and Cronbach's alpha.

Constructors	Scales	Factor Loading	Cronbach Alpha	CR	AVE
Perceived Pleasure	PP1	0.726	0.955	0.956	0.878
	PP2	0.716			
	PP3	0.693			
Knowledge Sharing	KS1	0.852	0.981	0.982	0.915
	KS2	0.861			
	KS3	0.775			
Self-Efficacy	S1	0.861	0.976	0.976	0.931
	S2	0.869			
	S3	0.888			
Knowledge Application	KA1	0.799	0.977	0.977	0.895
	KA2	0.813			
	KA3	0.788			
	KA4	0.803			
Learning Performance	LP1	0.674	0.961	0.961	0.892
	LP2	0.726			
	LP3	0.732			
Perceived Usefulness	PEU1	0.767	0.967	0.968	0.884
	PEU2	0.735			
	PEU3	0.735			
	PEU4	0.707			
Learnability	L1	0.819	0.989	0.990	0.951
	L2	0.805			
	L3	0.823			
	L4	0.816			
	L5	0.808			
Perceived Ease of Use	PEOU1	0.810	0.972	0.972	0.920
	PEOU2	0.798			
	PEOU3	0.790			
Technology Adoption	TA1	0.752	0.973	0.974	0.926
	TA2	0.728			
	TA3	0.733			
Entrepreneurial Intention	EI1	0.792	0.899	0.891	0.733
Entrepreneurial Intention	EI2	0.753			
Entrepreneurial Intention	EI3	0.751			

Furthermore, using different techniques such as the compared square root of AVE of each construct with the correlation among the constructs, discriminant validity was

assessed. The value of the AVE's square root should be higher than the correlation among the constructs [122]. Furthermore, the inter-construct correlation was less than the recommended benchmark value of 0.70 as directed in the correlation matrix (Table 4).

Table 4. Correlation, mean, standardization, and diagonal is the square root of AVE.

Constructs	M(SD)	1	2	3	4	5	6	7	8	9	10
Perceived Pleasure	4.96 (1.24)	0.937									
Knowledge Sharing	4.95 (1.42)	0.630	0.957								
Learnability	4.59 (1.40)	0.716	0.639	0.975							
Knowledge Application	4.98 (1.18)	0.686	0.595	0.666	0.946						
Perceived Usefulness	5.01 (1.24)	0.640	0.645	0.679	0.672	0.940					
Self-Efficacy	5.10 (1.43)	0.573	0.429	0.490	0.601	0.533	0.965				
Perceived Ease of Use	5.22 (0.912)	0.663	0.573	0.628	0.600	0.695	0.503	0.959			
Technology Adoption	5.43 (1.22)	0.677	0.639	0.671	0.651	0.747	0.485	0.678	0.962		
Learning Performance	5.22 (1.31)	0.774	0.614	0.676	0.718	0.684	0.635	0.624	0.651	0.945	
Entrepreneurial Intention	5.26 (1.38)	0.491	0.372	0.398	0.389	0.563	0.576	0.585	0.443	0.493	0.856

SEM is a multivariate statistical analysis and examines the affiliation between the studied variables. AMOS has the built-in ability to assess and calculate CFA and multi-regression, measurement models, and structural models simultaneously. AMOS also assists researchers in articulating models for variables and also provides the goodness-of-fit indices, which verifies the model. It also runs and presents a graphical representation of the model. The graphical representation of the path analysis is shown in Figure 2. In this research, different goodness of appropriate indicators was adopted. The most frequently used indicators are Chi-square (X^2/df), comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square root error of approximation (RMSEA), incremental fit index (IFI), and normed fit index (NFI). Benchmark values of the goodness-of-fit model are presented in the table below, which were in the given studies [120,140]. The results are shown in Table 5.

Table 5. Goodness-of-fit indices.

The Goodness of Fit Model				
Indices		Benchmark values	Measurement Model	Structural Model
Chi-square	(X^2/df)	≤ 3	2.253	3.123
Tucker-Lewis index	TLI	≥ 0.95	0.980	0.963
Incremental fit index	IFI	≥ 0.95	0.983	0.967
Comparative fit index	CFI	≥ 0.95	0.983	0.967
Normed fit index (NFI).	NFI	≥ 0.95	0.968	0.952
Root mean square root error of approximation	RMSEA	≤ 0.08	0.048	0.062

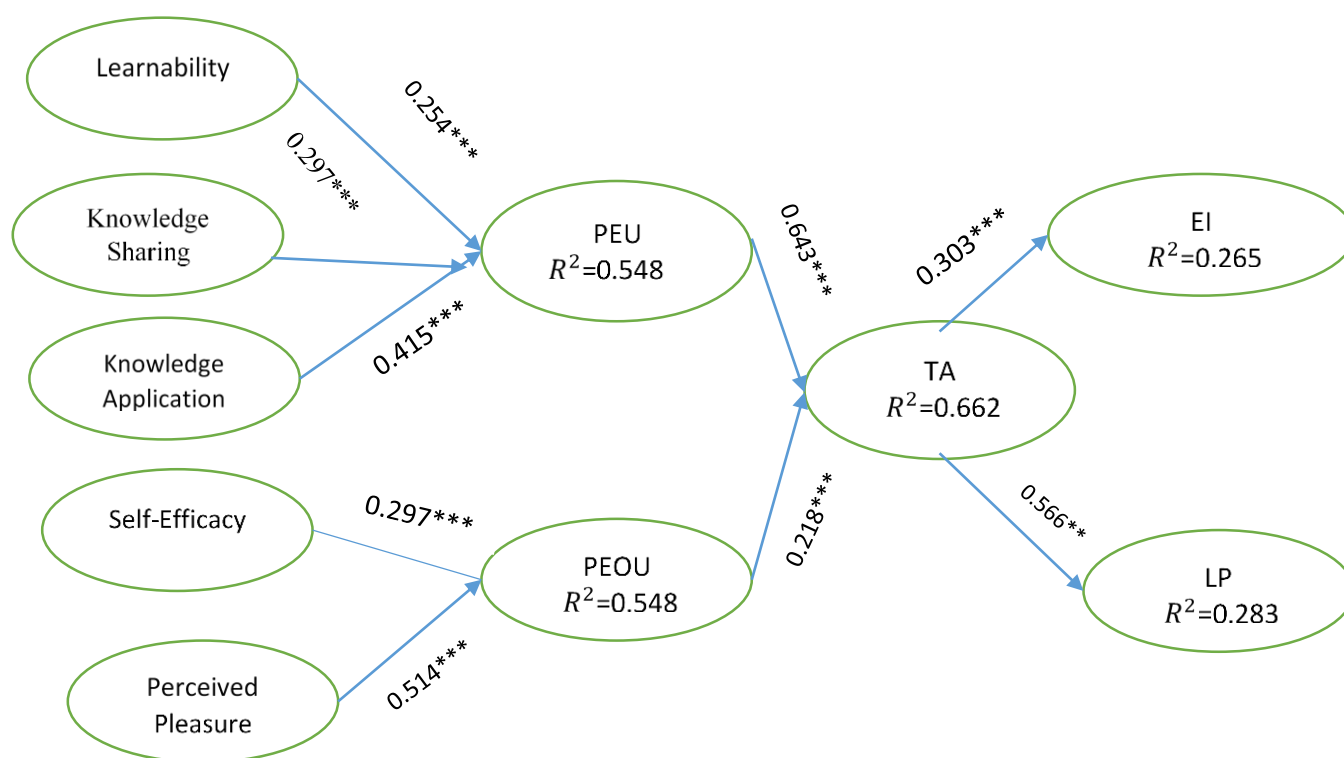


Figure 2. Graphical representation of the path coefficient of business simulation game adoption. PU (perceived usefulness), PEOU (perceived ease of use), TA (technology adoption), EI (entrepreneurial intention), LP (learning performance). In the values, ***, **, * indicate significance at the 1%, 5%, and 10% significance levels, respectively.

After analyzing the measurement and structural model fitness, the next step is to perform and examine the path coefficient analysis. The results for the overall sample as well as for each of the two sub-sample technology adoption were online classes and business simulation games. A two-step construction procedure measurement [141,142] was used to evaluate the eight hypotheses.

H1 is fully supported, as the results show that β values for online classes and business simulation games were positive where business simulation games ($\beta = 0.254, p < 0.001$) had a greater value than online classes ($\beta = 0.200, p < 0.001$). Similarly, H2 was positive in both cases. However, business simulation games ($\beta = 0.297, p < 0.001$) had greater value than online classes ($\beta = 0.113, p < 0.05$). For H3, business simulation games ($\beta = 0.415, p < 0.001$) had a greater value than online classes ($\beta = 0.168, p < 0.01$). The H4 and H5 results were quite interesting. Business simulation games were fun to play and increased self-efficacy with ($\beta = 0.514, p < 0.001$) and ($\beta = 0.297, p < 0.001$), where it was insignificant for online classes. H6 was supported. Perceived usefulness to technology adoption in the case of online classes and business simulation relationships was positive ($\beta = 0.274, p < 0.001$) and ($\beta = 0.634, p < 0.001$), respectively, but simulation games had a strong relation. H7 in the case of perceived ease of use and technology adoption online classes had weak insignificant relation, whereas, simulation games had positive significant relations ($\beta = 0.218, p < 0.001$). H8 technology adoption and learning performance relationship online classes had weak insignificant relation, whereas, simulation games had positive significant relations ($\beta = 0.566, p < 0.001$). The model also verified a high level of predictive power (R^2) as the modeled constructs explained 59.5% of the variance in perceived usefulness, 48% of the variance in perceived ease of use, 59% of the variance in technology adoption, 41.9% of the variance in learning performance, and 44.3% of entrepreneurial variance. The results are shown in Table 6.

Table 6. Path coefficient analysis and hypotheses testing.

	Hypothesis	Overall Sample	Online Classes	Business Simulation	Results
H1	Learnability → PU	0.427 ***	0.200 ***	0.254 ***	Fully Supported
H2	Knowledge Sharing → PU	0.066 (na)	0.113 *	0.297 ***	Fully Supported
H3	Knowledge Application → PU	0.145 **	0.168 **	0.415 ***	Fully Supported
H4	Self-efficacy → PEOU	0.151 ***	0.003 (na)	0.297 ***	Supported for Business Simulation
H5	Perceived Pleasure → PEOU	0.691 ***	0.053 (na)	0.514 ***	Supported for Business Simulation
H6	PEU → Technology Adoption.	0.140 ***	0.274 ***	0.634 ***	Fully Supported
H7	PEOU → Technology Adoption	0.657 ***	0.119 (na)	0.218 ***	Supported for Business Simulation Games
H8	Technology Adoption → Learning Performance	0.934 ***	0.121 (na)	0.566 ***	Supported for Business Simulation Games
H9	Technology Adoption → Entrepreneurial Intention	0.253 ***	0.085	0.303 ***	Supported for Business Simulation Games
R^2	Perceived Usefulness R^2	0.595	0.171	0.548	
	Perceived Ease of Use R^2	0.480	0.002	0.452	
	Technology Adoption R^2	0.590	0.081	0.662	
	Learning Performance R^2	0.419	0.011	0.265	
	Entrepreneurial Intention R^2	0.443	0.073	0.283	

Note: PEU, perceived usefulness, PEOU, perceived ease of use. ***, **, * indicate significance at the 1%, 5%, and 10% significance levels, respectively.

5. Discussion

Education is one of the most important aspects of human life, which cannot be regarded as a second priority task. Whether it is a new level of education or a higher level, every nation and country wants to provide their young minds with a consistent and strong foundation of curriculum and knowledge [21,141,142]. Regardless of the circumstances they are facing, human minds are constantly struggling and developing methods and strategies to cope up with nature and unanticipated conditions, which lays unimaginable hurdles and obstacles in social learning and education [139,143]. COVID-19 has hit the world badly, and countless daily life operations have been disturbed, among which the most important is the education sector [131,144,145]. Among the education sector, the portion of business and management education can be considered as one of the most important factors. Due to the dwindling world economic situation, it is now essential to teach business students how they can connect the theories and knowledge they are obtaining through lectures with their practical lives. Whenever we talk about the connection between practical life and the real world, the first thing that comes to mind is the classroom environment [26,146]. It is eminent from an instructor's perspective to provide as many practical examples as possible to their students so that they can understand the theory in a more elaborative way [147].

Due to the emergence of the COVID-19 global pandemic, researchers have had the opportunity to discuss the impact of the pandemic on the education sector. It also helps researchers to discover the interrelationship among the content of the lecture and its practical implications considering online methods as the medium of instruction [25,146]. It is essential to measure the impact of business simulation activities on the student's learning

performance while staying at home [131]. Moreover, it is also important to understand the educational requirements of the targeted students, so that the instructor can inculcate innovations in online teaching services for a better and enhanced understanding of their students [145]. This research primarily focused on the management of sciences university students, who were taking the entrepreneurship course. Entrepreneurship is the course in which individuals need to make all the financial, marketing, management, teamwork, and human resource decisions. Online teaching is the reality of the new world, and educational institutes are being forced to adopt this kind of teaching methodology due to the pandemic situation, and it is a fact that they are not ready for this kind of challenging task. It is time to find solutions for this kind of problem. Without proper and meaningful teaching methods, we cannot hope to equip our new generation with enough knowledge to cope with new and unimaginable situations such as COVID-19.

The results of this study show that in the case of online classes, the hypotheses were weekly significant, and assumptions defined were nullifying as they were insignificant. On one hand, hypotheses in a business simulation were strongly significant compared to online classes. First, in the case of online courses, high-speed Internet is required, and students are dependent on an uninterrupted Internet connection. First, in the case of online classes, high-speed Internet is required and students are dependent on uninterrupted Internet connection. If technical problems occur, students may be unable to communicate with the teacher or classmates and access the study material. These types of problem cause frustration among the students, hamper performance, and dampen learning [109]. Online classes are considered the more straightforward means of attaining grades such as exams, quizzes, and unsupervised assignments, which are detrimental to the learning process. Online courses mean that students need to work independently, be self-motivated, and self-directional. If students fail to get an immediate result, it may result in class [27]. The online mode of instruction dampens the students' learning performance as they have lemmatized the number of questions in their mind and grants the teacher and classmates' time to respond [111,147].

On the other hand, simulation can be described as an interactive tool for conveying theoretical concepts with real-world dimensions. It is considered a useful tool for educating and engaging individuals and increasing their level of interest. It is a practical way of implementing their theoretical knowledge by nullifying the risk level entirely and is a crucial tool for experience learning [81]. However, managing authenticity and reality is considered an essential factor in making simulation systems. Due to the balance in maintaining authenticity while minimizing complexity level and keeping it close to reality, there is a challenge in facing the validity of the simulation system [112]. In this dynamic environment, business simulation is a competence-based learning tool that calls for innovative learning methods through simulation games and technologies. Its main benefit is that it lets an individual feel an autonomous risk-free environment to execute their knowledge and skills without time and space [113,148]. Business simulation games have been considered as a major e-learning tool for several decades, and recently, many universities and schools have started to adopt this method in their systems [114]. The business simulation environment can allow students to learn through experience, which is based on reality and helps them improve their decision-making skills as well as increase their confidence level in dealing with real-life situations [115]. Simulation can be a useful tool for motivating individuals to maximize their learning process and develop a tactical mindset for decision-making skills. In a business simulation, games are considered a fundamental aspect because it provides entertainment and enjoyment. It also grabs the interest of students and involves them using simulations for both business and academic purposes to increase their performance. Therefore, the more entertainment and enjoyment provided in gameplay design, the more participants will be motivated and encouraged to play it and thus achieve their goal [116]. Some researchers have also discussed the value of simulation games in the marketing system as it permits the evaluation of alternative strategies to observe the pattern of behaviors that occur [20]. These simulation games provide guidelines for some rules and regulations

to follow and are based on reality-based scenarios that help individuals with easy and smart learning with zero risks of losing [148,149].

Studies suggest that simulation is an innovative and creative way of learning, which increases student intention and focuses on real business scenarios. Business simulation games are generally used in entrepreneurship, marketing, management, product development, and for financial reporting purposes. Its role is critical in entrepreneurial activities as it provides a virtual environment and different business scenarios that are based on reality, and entrepreneurs can test their knowledge and business skills through these platforms without the risk involved in the real-world [143,148,149].

Entrepreneurial opportunities are the most important in creating the intention of an individual toward ventures because these opportunities are situations that can be introduced and sold at a higher price than the cost of production and if individuals believe that the product or service will be beneficial in the future [134,150]. Researchers have also suggested that entrepreneurial intention is also linked with the individual's psychological abilities, which distinguishes them from non-entrepreneurs, and they defined some personality factors for them such as having (1) the need for achievement [63]; (2) having a locus of control [63]; and also having risk-taking propensity [64]. Researchers have also argued that entrepreneurial intention and the intent of new venture creation has its cognitive origin in an individual's motivation and other factors that spark their behavior and steer their energy toward obtaining their objective or goal [64,65]. Some researchers have further argued that entrepreneurial intention has two levels in which the first is the traditional level and the second is the motivational level [66,67]. The first level revolves around the environmental conditions, which tend to reinforce the behavior of an individual [59] whereas the second level is subjected to inner motivation and expectation of the individual from their entrepreneurial intentions [151,152]. In terms of higher education students, there is a need to understand what factors influence and shape the behavior of students toward making entrepreneurial intentions about starting a new venture and there should be policies and programs to promote this entrepreneurial behavior in students [145,153]. The research suggests that most education focuses on entrepreneurship education and very few address the issue of venture creation, which should also be considered as a very important part of entrepreneurship education [142,144,154].

6. Conclusions and Implications

During this challenging time, this study provides an opportunity to universities, teachers, and students of management departments to enhance their capabilities and abilities by involving themselves in business simulation games. The key duties and responsibility of universities are to enhance the academic performance of the study. Business simulation games make it possible for students to think, communicate, and solve problems creatively and proactively, and these simulation games can be played at any location. It is because this system significantly cuts the hardware and location costs. Furthermore, these activities are enjoyable to play, and participants gain confidence in making decisions, hence, improving their academic and learning performance. It is suggested that, for management departments, these activities should even be introduced during regular days so that students can learn to work in teams and make decisions. In the case of business simulation games, knowledge management practices significantly impact perceived usefulness, which in turn enhances the student's intention to adopt business simulation games. Therefore, the management science department should adopt new and innovative teaching techniques and the latest technologies that are interactive digital technologies. They can help students enhance collaborative learning, gain knowledge, think proactively, and build a competitive edge for universities. These games provide universities to build an interactive system for both students and teachers. Simulation games are learning moving stations, which are available at the best cost for students. Therefore, educational institutes should enrich themselves with technology-oriented learning. This may exponentially impact the educational capacity of the universities. Simulations are now considered an integral part for entrepreneurs, as

they are now practiced and contributing to the overall advancement of entrepreneurship education as well as engaging individuals in entrepreneurial activities using these simulations based games. Business simulations enhance the motivation level of students as well as teachers. It increases their level of interest as they find it enjoyable, risk-free, and easy to operate. It will further enhance their decision-making abilities and skills and make them strategically proficient in terms of education performance and decision-making skills [36]. Based on the practical implications, the authors designed a model (Figure 3) for practical importance in the future.

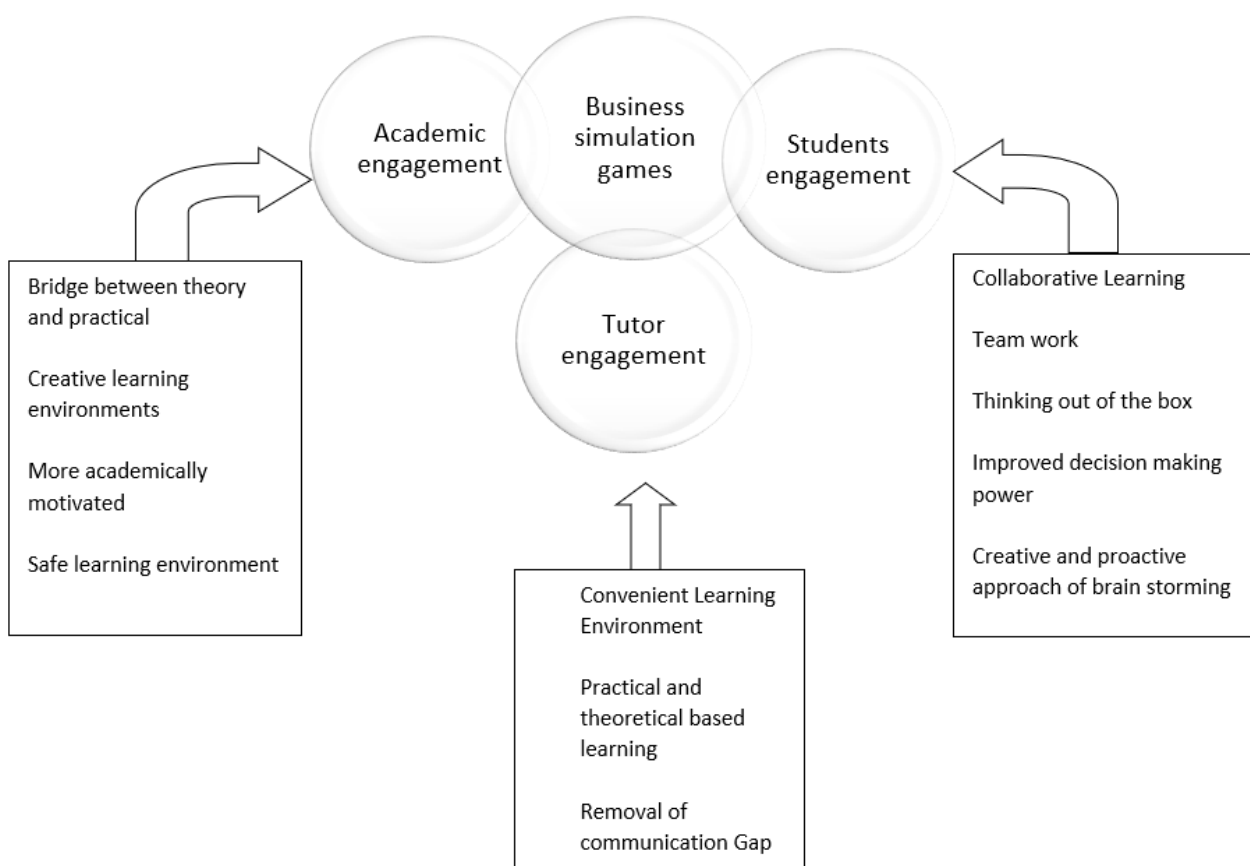


Figure 3. Author contribution: theoretical framework of business simulation games.

Limitations and Future Research Directions

The lockdown situation created by COVID-19 forced us to collect data within our approachable limits. Furthermore, this study needs more students, especially in entrepreneurship courses, through an online medium of instruction in other universities. Still, the limitation of accessibility to those students also limits the horizon of this study. Time could also be considered another limitation because the COVID-19 situation has severely hampered both students and instructors, who need some kind of immediate solution related to their current problems. Due to the wider applicability, this research could also be beneficial for other fields of study such as computer sciences and engineering. Instructors could also use these types of games for the fields of fine arts. Another essential aspect that needs to be researched by other investigators is the impact of these simulation games on the student's level of motivation and enthusiasm. Therefore, we can also be sure about the inclusion of these games in our future educational and curriculum plans as well as measure the student entrepreneurial intention.

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Appendix A

This figure shows a detailed insight regarding the mechanism of online business simulation game adopted for this study.

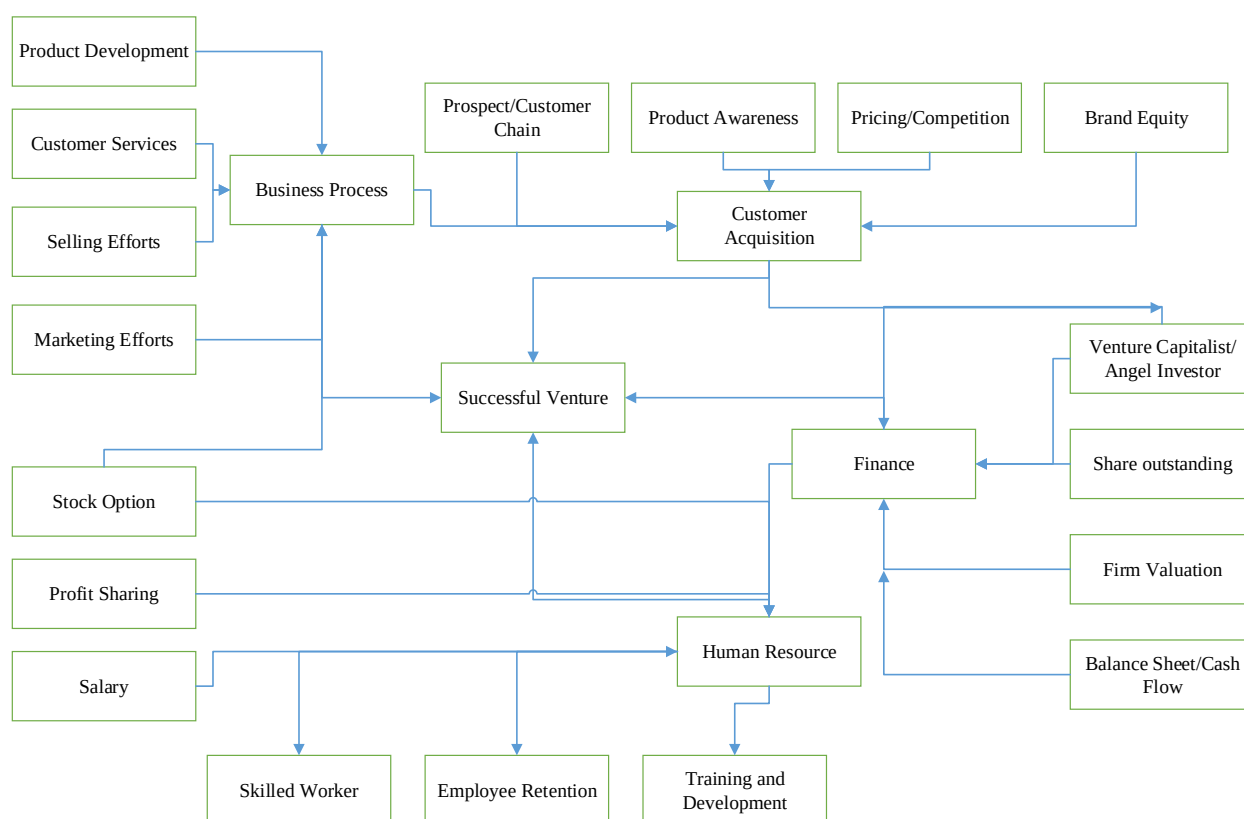


Figure A1. Business game requirements for entrepreneurship students.

First, you have to deal with the human resource factor because, without it, an entrepreneur cannot achieve their desired goals. This is based upon hiring or selecting an appropriate resource for the job, their experience regarding that work, the quality of work provided by that specific employee, employee satisfaction toward their job, the company's work culture, and finally, the employee's overall productivity. This whole scenario leads to another critical factor, which is the business process of the organization, and includes, but is not limited to product development, customer services, sales efforts, and marketing efforts. A comprehensive and well-executed business process leads to the development of prospective customers and eventually develops a customer chain process. These customers will then buy the product due to product features and attractiveness, product pricing,

brand equity, and market competition. It will also play a vital role in the development of loyalty and prospective customers.

Appendix B Questionnaire: Survey Items

All items were measured on a seven-point Likert scale: “(1) Strongly disagree, (2) Disagree, (3) Somewhat Disagree, (4) Neutral, (5) Agree, (6) Somewhat Agree, (7) Strongly Agree”.

Knowledge sharing (KS) (Gold, Malhotra, & Segars, 2001; McIver & Lepisto, (2017)

KS1. The knowledge shared by teachers and class-fellows over business simulation games is relevant to the topics.

KS2. The knowledge shared by teachers and class-fellows over business simulation games is easy to understand.

KS3. The knowledge shared by teachers and class-fellows over business simulation games is complete.

KS4. The knowledge shared by teachers and class-fellows over clouds is reliable.

Knowledge application (KA) (Gold, Malhotra, & Segars, 2001; McIver & Lepisto, (2017)

KA1. Past experiences and knowledge of business simulation games help to tackle academic problems.

KA2. Previous experiences and knowledge of business simulation games help in the decision-making process.

KA3. Previous experiences and knowledge of business simulation games should be employed in problem-solving.

Learnability (LA) (Gold, Malhotra, & Segars, 2001; McIver & Lepisto, (2017)

LA1. A lot of training is needed to perform the work while using business simulation games.

LA2. Specific skills are needed to perform the work while using business simulation games.

LA3. Experience is needed to perform the work while using business simulation games.

LA4. Business simulation games take a lot of time to learn how to perform the work.

LA5. I always know what the results will be before using business simulation games.

Perceived-self-efficacy (PSE) (Lee and Mendlinger 2011; Moon & Kim, 2001)

PSE1. I have the skills necessary to use the business simulation games.

PSE2. I have an Internet connection fast enough to use the business simulation games.

PSE3. I have the knowledge necessary to use business simulation games.

PSE4. Overall, I am ready to use the business simulation games.

Perceived-enjoyment (PE) (Davis et al. 1992)

PE1. I find using the business simulation games to be enjoyable for fulfilling my academics needs.

PE2. The actual process of business simulation games is pleasant.

PE3. I have fun playing business simulation games.

Perceived usefulness (PU) (Davis 1989)

PU1. Adopting business simulation games would improve my academic performance.

PU2. Adopting business simulation games would increase the efficiency of my studies and work.

PU3. Adopting business simulation games would make it easier to manage knowledge.

PU4. Adopting business simulation games in academia would increase my performance.

PU5. Adopting business simulation games would enable me to accomplish tasks more quickly.

Perceived-ease-of-use (PEU) (Davis 1989)

PEU1. Learning to adopt business simulation games would be easy for me.

PEU2. My interaction with business simulation games would be clear and understandable.

PEU3. It would be easy for me to become skillful by using business simulation games for learning.

Technology Adoption (Ali, Gongbing, & Mehreen, 2018)

TA1. I predict that I will continue to use business simulation games for educational purposes.

TA2. I plan to use business simulation games to manage my educational tasks.

TA3. I intend to use business simulation games in the future for academic purposes.

Learning Performance (Hidayanto & Setyady, 2014; Sarwar, Zulfiqar, Aziz, & Chandra, 2018)

LP1. I plan to use business simulation games to manage my education-related learning.

LP2. I predict that I will continue to use simulation games for educational purposes and feel competent in completing my academic tasks.

LP3. I have learned how to do my task compilation efficiently.

Entrepreneurial Intention (Solevik, Westhead, Kolvereid, and Matlay 2012)

EI1. I am ready to do anything to be an entrepreneur.

EI2. My professional goal is to become an entrepreneur.

EI3. I am determined to create a business venture in the future.

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