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MDPI

Systematic Review

Business Simulation Games for the Development of Decision Making: Systematic Review

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Abstract: Business simulation games (BSGs) are considered a useful instructional tool to be implemented in the classroom, especially in light of new trends in education. The key components of the paradigm are BSGs and Decision Making (DM), as the latter is often essential to a high-quality education. Thus, over the last 10 years, efforts to find possible methods to enhance BSG learning experiences for the development of DM in higher education have increased. The goals of this article were to examine the effect of BSGs on students' DM at university, and to identify the elements that can be developed in the BSG learning experience to promote DM. Following PRISMA criteria, a systematic review was carried out using Scopus, Web of Science, and ProQuest. A total of 13 of the 2897 papers that were first discovered underwent a comprehensive review, with all conclusions and findings subjected to analysis. Following implementation, the majority of the BSG learning experiences enhanced DM results. In summary, a few key elements have been highlighted that must be followed to ensure the BSG learning experience helps students foster their DM.

Keywords: business simulation games; decision making; innovation; digital technologies; teaching practice; higher education; quality education

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1. Introduction

Recent years have seen a rise in interest in learning about cutting-edge teaching techniques because they present fresh opportunities for the advancement of education, to the great benefit of both teachers and students (Gatti et al., 2019; Sultanova & Sadullayev, 2024). The considerable impetus provided by new technologies has made it possible to bring education closer to a larger audience and has also supplied very valuable tools for innovation, all the while enabling a level of flexibility that was unimaginable only a few years ago (Haleem et al., 2022). This study will specifically concentrate on Business Simulation Games (BSGs) for Decision Making (DM) development because they have acquired great importance recently (Faisal et al., 2022) and are increasingly in demand in higher education due to the fact that BSGs foster learning experiences that improve decision-making skills, skills that must be worked on in quality teaching (Huang et al., 2022).

BSGs are experiential learning tools that allow students to run a simulated organization in a realistic, interactive, and risk-free setting while learning about business management (Bach et al., 2023). Students compete individually or in teams, make strategic decisions, work through difficult scenarios, feel the effects of their decisions, and grow from their failures (Coffey & Anderson, 2006; Faisal et al., 2022). Closely linked to the concept of BSGs

are the Serious Games that were originally defined as games that are not meant to be played solely for entertainment but rather have a clear and carefully planned educational goal (Abt, 1970; Michael & Chen, 2005). Serious Games expose the player to an environment that provides content based upon experience or knowledge. This experience relates to the particular serious gaming context, like business or education (Laamarti et al., 2014).

BSGs represent a subset of game-based learning and are being utilized in higher education more and more, because typically they provide students with excellent experiences (Silitonga et al., 2024). BSGs have grown more sophisticated and ubiquitous as technology has advanced and spread (Ferreira et al., 2021). This widespread use is due to a variety of factors, the most common of which is the desire to provide the most realistic atmosphere for corporate DM in a classroom setting (Jääskä et al., 2022; Yalabik et al., 2012). Several researchers have looked at how BSGs relate to learning. BSGs are instruments that facilitate the study of enterprise management by offering a low-risk, regulated situation with competition. They provide a safe, secure environment in which students can learn by modeling a variety of real-world circumstances (Beranič & Heričko, 2022; Hernández-Lara et al., 2018; Pando-Garcia et al., 2016). Thus, for instance, BSGs can facilitate a breakthrough in entrepreneurial attitudes and self-efficacy or teach students about the economic laws governing companies and the market by using a game (Chen et al., 2022; Peterková et al., 2022). Studies have also suggested that BSGs enhance DM abilities (Bach et al., 2023; Endress et al., 2023) and are favorable to higher-order thinking capacity, which are dependable indicators of success in the workplace and in school (Faisal et al., 2022; Huang et al., 2023). Lastly, BSGs are also very helpful because they enable the development of the competencies that businesses need. To be more precise, BSGs give students opportunities for multi-layered learning and support the development of soft skills including data analysis, DM, and strategic thinking (Grijalvo et al., 2022; Mustata et al., 2017).

DM skills are one element that is intimately related to students learning to be prepared for the real life of a company, as managers have to make many decisions in their daily work (De La Torre et al., 2021; McChlery & Visser, 2009; Tsiligiris & Bowyer, 2021). DM is the learner's cognitive ability to carry out systematic and rational DM processes which involves relating and adapting to other people, choices, and also the individual DM process (Grijalvo et al., 2022). Making mistakes in DM can lead to significant or costly consequences for organizations, which is why it is so important for business students to practice and work on DM skills (Goosen & Steenkamp, 2023; Hallo & Nguyen, 2021).

Herbert Simon's theory explains the DM process and the skills needed to carry it out (Sakata et al., 2014). According to this theory (Simon, 1997), the procedure consists of four phases: intelligence (collecting data and evaluating it to pinpoint problems or relevant aspects); design (creating a number of strategies to address the problems or relevant aspects); choice (choosing the best strategy of action to address the problems or relevant aspects); and review (executing the selected strategy of action, assessing and analyzing the results to guide the subsequent course of the decision). Three skills are often needed for each of the four DM stages. Collecting data from financial accounts and news about the decision maker's own company as well as other businesses, such as competitors, is part of the intelligence and review stages. As such, these phases necessitate the capacity to evaluate present conditions. In contrast, design and choice require the decision-maker to make use of the given data to generate possible strategies and then select which of them to implement. Therefore, the capacity to devise workable plans is essential for these two phases of the process. Furthermore, the ability to work well with others facilitates the smooth progression of the four stages and encourages the team to reach a consensus.

This interest has produced a wealth of studies that concentrate on BSGs in higher education (Faisal et al., 2022). According to current research, DM improvement is especially

relevant for the education of business students (Faria et al., 2009; Hofstede et al., 2010; Pacheco-Velázquez et al., 2023). Our research questions were the following: (1) what is the relation between the BSG learning experience and DM at university and (2) what elements can be developed by the BSG learning experience to promote DM? Therefore, the goals of the current study were as follows: (1) to examine the effect of BSGs on students' DM at university and (2) to identify the elements that can be developed in the BSG learning experience to promote DM. Motivated by the necessity of collection and analysis, this paper will be very beneficial to researchers, university instructors, and workers in the corporate world who want to grow to the fullest extent of their abilities and achieve fulfillment with their performance.

To the best of the authors' knowledge, no systematic review has met the objectives of this investigation. Some reviews on BSGs have focused on other outcomes such as intrinsic motivation (Vélez et al., 2023) or leadership (Lopes et al., 2013), and others have focused on general aspects of BSGs (Brandl & Schrader, 2024; Faisal et al., 2022; Ferreira et al., 2021).

The article will be organized as follows: the first section presents the research materials and methods; the next details the results followed by a written discussion. The main conclusion, limitations, and recommendations for further research are presented in the last section.

2. Materials and Methods

This systematic review was carried out in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards, provided in Supplementary Material S1 (Moher et al., 2015; O'Reilly et al., 2018).

Every article on the list has undergone a rigorous review process, thanks to the criteria set by PRISMA.

2.1. Design

A thorough search was conducted of the Scopus, Web of Science, and ProQuest databases by both authors in order to find papers that were published before 12 July 2024. Titles, keywords, and abstracts were the search parameters used. The terms "population", "interventions", and "outcomes" were included in the search strategy. The population terms, "university", "higher education", high education"; the intervention terms, "business game", "management game", "business simulation game", "management simulation game"; and the outcome terms, "decision making", were connected using OR. The three keyword groupings were combined using AND.

2.2. Screening Strategy and Selection of Scientific Articles

Duplicate records were eliminated when the search was finished. The remaining records were then examined by both authors to see if they met the inclusion or exclusion criteria, which are displayed in Table 1 below.

Table 1. Inclusion/exclusion criteria.

Criterion	Inclusion Criteria	Exclusion Criteria
1. Population	Students receiving university education	Students who do not receive university education
2. Intervention	Business Simulation Games (BSGs) intended to promote Decision Making (DM)	Programs that are not BSGs or that are not intended to promote DM
3. Comparison	Inapplicable	Inapplicable

Table 1. *Cont.*

Criterion	Inclusion Criteria	Exclusion Criteria
4. Outcomes	Programs that provide information on DM outcomes from BSGs	Programs that do not provide information on DM outcomes from BSGs
5.Study design	Only original, full-text articles in either English or Spanish	Written in a language other than English or Spanish. A few examples of non-original article types are book chapters, reviews, letters to the editor, abstracts from conferences, and protocol proposals.

2.3. Data Selection

The elements of BSGs that could facilitate DM were located, and the data that most represent BSGs were retrieved. This was accomplished by presenting all of the facts from the original articles in a single table, together with the following information: aim, country, sample size, area, measurement methods, results, and conclusion.

2.4. Methodological Assessment

By adjusting the STROBE assessment criteria, the methodical review methodology was utilized to find papers that fit the inclusion requirements (Alamri et al., 2020). Each item was scored using a numerical description (1 = included, 0 = not included). The rating of each study was assessed qualitatively in accordance with the guidelines provided in Supplementary Material S2 by O'Reilly et al. (2018). If an article scored seven or more points, it was considered to have a low risk of bias; if it had fewer points, it was considered high risk.

3. Results

3.1. Identification and Selection of Studies

Of the 2897 documents that came from their original sources, 29 were duplicates or triplicates found in the databases of Scopus, The Web of Science, and ProQuest. As a result, 2868 articles were downloaded. After a second assessment of the titles, abstracts, and full texts of the remaining publications had been carried out using the same standards indicated in Table 1, 1732 studies were disregarded in accordance with Criterion 5 (Study). Of the 1136 articles that remained, 646 were removed for failing to meet Criterion 1 (Population), 446 were removed for failing to meet Criterion 2 (Intervention), and 31 were removed for failing to meet Criterion 4 (Outcomes). Finally, 13 publications were included in the qualitative analysis. The four PRISMA-recommended phases and the inclusion and exclusion criteria for each research stage are depicted in a flow diagram in Figure 1.

3.2. Methodological Quality

Table 2 shows a very high overall methodological quality rating for each of the STROBE assessment criteria (O'Reilly et al., 2018), which are covered in Section 2.4.

Table 2. The methodological quality of the articles.

Reference	1	2	3	4	5	6	7	8	9	10	Q
Chen and Wei (2017)	1	1	1	1	1	1	1	1	1	0	9
Endress et al. (2023)	1	1	1	1	1	1	1	1	1	0	9
Grijalvo et al. (2022)	1	1	1	1	1	1	1	1	1	1	10
Hernández-Lara and Serradell-López (2018)	1	1	1	1	1	1	1	1	1	1	10
Hernández-Lara et al. (2018)	1	1	1	1	1	1	1	1	1	1	10

Table 2. *Cont.*

Reference	1	2	3	4	5	6	7	8	9	10	Q
Jääskä et al. (2022)	1	1	1	1	1	1	1	1	1	1	10
Mannino et al. (2021)	1	1	0	1	1	1	1	0	1	0	7
McKone and Bozewicz (2003)	1	1	1	1	1	1	1	0	1	0	8
Mustata et al. (2017)	1	1	1	1	1	1	1	1	1	1	10
Sakata et al. (2014)	1	1	1	1	1	1	1	1	1	0	9
Seethamraju (2011)	1	1	1	1	1	1	1	1	1	0	9
Yalabik et al. (2012)	1	1	1	1	1	1	1	1	1	0	9
Zöbeley et al. (2011)	1	1	1	1	1	1	1	0	1	1	9

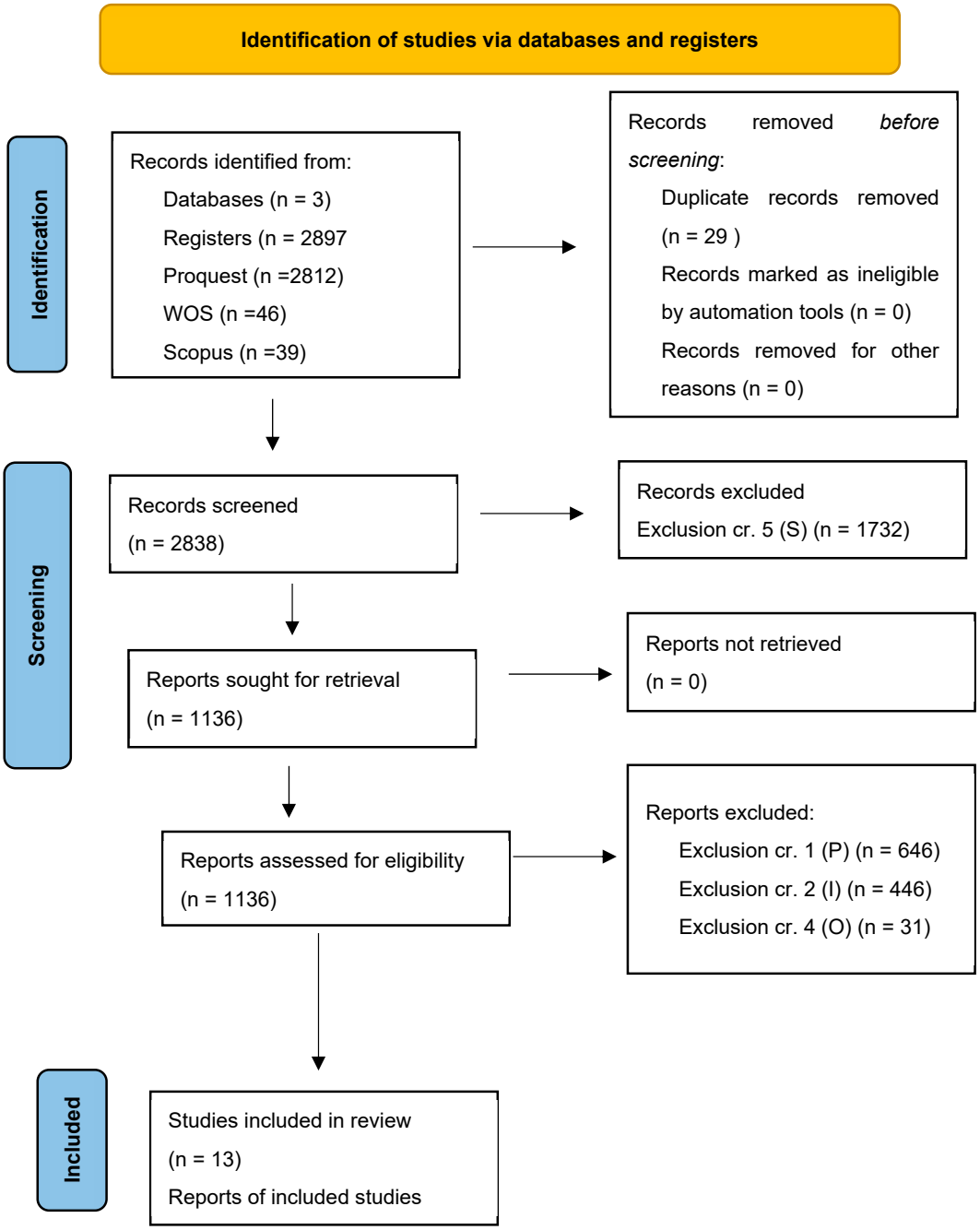

Figure 1. Flow diagram of the study.

3.3. Article Analysis

Table 3 presents the key findings regarding the BSGs implemented in each investigation, as well as the analytical results gleaned from the original papers. In addition, Table 4 provides more specific information on the background or traits of the BSG, its type, the key elements of its implementation, and the impact or benefits of the BSG in each study.

As observed, the interventions were performed in a variety of geographical locations, allowing BSGs to be produced without regard to national customs or cultural characteristics. Furthermore, the sample sizes are quite representative, and the BSGs were applied in a wide range of knowledge domains, so they can be utilized in any of them without being limited by the specifics of each one. Most of the BSGs analyzed were computer games. With respect to the measurement methods, we discovered surveys created by the study authors themselves or by others, and observations.

It is evident from the examined articles that BSGs have favored DM. Furthermore, a couple of BSGs have fostered additional skills like analytical thinking, strategic thinking, teamwork, problem-solving, proactive thinking, communication, intuitive thinking, responsibility, time management, argumentation, conflict management, courage, and self-esteem.

Table 3. Aim, country, sample, area, measurement methods, results, and conclusion.

Study	Aim	Country	Sample Size	Area	Measurement Methods	Results	Conclusion
Chen and Wei (2017)	Examine the use of Business Simulation Game (BSG) training in project management Decision Making (DM).	Taiwan.	50.	Project planning and control.	Survey.	After playing the BSG, students perform better in DM, simulation, interactivity, interest, learning efficiency, and immersion.	In comparison to alternative training modalities, the suggested BSG guarantees superior performance in terms of cost and safety calculations.
Endress et al. (2023)	Examine a combined strategy that encourages engagement and interaction in the virtual classroom.	Thailand.	21.	MBA and PhD students.	Survey.	The students expressed a high degree of perceived learning accomplishment (enhanced enjoyment and DM). Additionally, all of the students were really involved in the game, and the interactive nature of the learning mode allowed for strong student collaboration and bonding.	A more limited scope simulation game can help promote engagement and involvement in lectures. With a basic game that has few choice variables and little training, one can benefit from the major advantages of simulation-based learning.
Grijalvo et al. (2022)	Determine the background and circumstances that facilitate the incorporation of business simulators into official educational settings.	Spain.	346.	Industrial Engineering.	Survey.	The data support the favorable opinion of the students as a means of enhancing these abilities, which include “DM”, “information analysis”, and “strategic capacity”.	It is not simple to use BSGs. Teachers must devote a significant amount of time to teaching even with the most advanced simulations.

Table 3. *Cont.*

Study	Aim	Country	Sample Size	Area	Measurement Methods	Results	Conclusion
Hernández-Lara and Serradell-López (2018)	Provide further evidence of how Business Simulation Games help students learn, taking into account the interactions that students have in online discussion boards.	Spain.	182.	Management.	Observation of online discussion forums.	The majority of students cited dealing with uncertainty, reaching agreements, teamwork, DM, and information processing as the most pertinent learning outcomes of the game.	Teachers ought to provide more assistance to students in managing risks and uncertainty. This assistance could come in the form of instruction on the inclusion and evaluation of various scenarios, mathematical tools for estimation and prediction, DM strategies for uncertain situations, etc.
Hernández-Lara et al. (2018)	Examine to what degree students consider BSGs to be an e-learning tool for management education.	Spain, Ireland, Portugal, Italy, and Germany.	120.	Management.	Questionnaire including some items that have already been published in the literature.	Information and DM were the most highly regarded generic skills.	Students from many nations and cultural backgrounds provided evaluations and DM that were both highly favorable and similar.
Jääskä et al. (2022)	Give new perspectives on the effective design and implementation of a computer game-based learning approach for teaching sustainability management in projects.	Finland.	15.	Project management.	Survey.	The use of this BSG enhances improved DM and intrinsic motivation.	Key issues covered in the game include the significance of decision making during the project design phase, the engagement of internal and external stakeholders in the decision-making processes, and the comprehension of how decisions made during the project affect the sustainability of the project product.

Table 3. *Cont.*

Study	Aim	Country	Sample Size	Area	Measurement Methods	Results	Conclusion
Mannino et al. (2021)	Address deficiencies in the training provided on managing the development of data warehouses.	United States.	N.R.	Data Warehouse.	Survey.	The use of the BSG improves students' DM skills.	Players must play multiple times to see the effect and get the most out of the game. The length of the game and the complex nature of the writing can discourage players from playing, but additional text and phases may improve the likelihood of a better learning experience.
McKone and Bozewicz (2003)	Present a business challenge from a holistic standpoint to demonstrate to students how different disciplines collaborate, display complementary knowledge, and interact to enhance DM.	United States.	150.	General management.	Questionnaire.	The use of the BSG improves student learning, including students' integrated DM skills.	This BSG has proven to be very beneficial in the classroom because it is (a) simple to use; (b) engaging and educational for students; (c) a tangible representation of a simplified service organization with intricate DM; and (d) an excellent tool for demonstrating an integrated approach to service management.
Mustata et al. (2017)	Determine whether components of the GM2 BSG can help participants achieve the necessary management-related skills and personal attributes.	Romania.	88.	General management.	Online survey.	Promotes DM and other skills such as analytical thinking, strategic thinking or teamwork.	Analytical thinking, strategic thinking, teamwork, goal-setting, opportunity recognition, problem-solving, DM, proactive thinking, communication, intuitive thinking, responsibility, time management, argumentation, conflict management, courage, and self-esteem were the 17 out of 21 desired competencies that were thought to have clearly shown positive development.

Table 3. *Cont.*

Study	Aim	Country	Sample Size	Area	Measurement Methods	Results	Conclusion
Sakata et al. (2014)	Analyze whether using a BSG with speech recognition technology improves management DM skills compared to traditional teaching.	Japan.	31.	General management.	Questionnaire.	The effectiveness of the intervention is confirmed, since it promotes students' DM skills.	Using speech recognition technology, the speech recognition assistance system BizVocie retrieves student speech during game play and transcribes it into text. Using BizLator, teachers may determine the boundaries of their pupils' understanding, enabling them to educate more effectively.
Seethamraju (2011)	Examine how BSGs affects DM, skill development, and the efficacy of learning.	Australia.	50.	Business and Information Technology.	Questionnaire.	This game has a big impact on the pupils' DM skills. Their process orientation and integrative skills significantly improved as a result of the game, which also aided in deep learning.	The following factors have made the BSG's implementation difficult: the game's quick speed, particularly in the beginning; insufficient accounting and finance knowledge; inexperience; poor teamwork, communication, and collaboration; the complexity of the BSG; and a general lack of business experience and knowledge.
Yalabik et al. (2012)	Examine the effects of decisions made regarding product-portfolio management, capacity management, and capability accumulation.	United Kingdom and India.	250.	New product development.	Questionnaire.	The strategic and operational DM abilities necessary for successful new product development and innovation strategy are enhanced by this BSG.	A number of features were taken into consideration when designing the game in order to enhance the learning process: involving human opponents; actions that impact one another and the environment; a focus on winning and competition; a recurring cycle of making decisions and experiencing outcomes; and the ability to hope for improvement and "doing better next time".

Table 3. *Cont.*

Study	Aim	Country	Sample Size	Area	Measurement Methods	Results	Conclusion
Zöbeley et al. (2011)	Examine how each person's conduct under distributed DM might be enhanced to align with the overarching goals of the organization.	Germany.	80.	Supply chain.	Observation.	The intervention improves students' DM skills.	Coordinated bonus plans, information sharing, and communication improve overall performance and reduce conflict amongst the functional domains involved in the game.

Table 4. Background/traits, type of business simulation game, key elements of implementation and impact/benefits.

Study	Background/Traits	Type of Business Simulation Game (BSG)	Key Elements of Implementation	Impact/Benefits
Chen and Wei (2017)	Students take on the role of a project manager, making choices about how to handle accidents and distribute resources as the virtual construction project moves forward.	Computer BSG using integrations of MySQL for project data management and Microsoft Project for project schedule.	Based on project data, real-time simulation is used to obtain the results of the decisions made. Students are then provided with interactive, visible responses that help them comprehend the consequences of their actions.	Decision-based simulation can offer accurate and realistic outcomes of their choices in this training mode.
Endress et al. (2023)	The BSG (LingoLearn) aims to introduce a language-learning app to the market. The students have to decide if they wish to enter the market and, if so, what approach they will use.	Computer BSG using a survey tool (PollEverywhere) to enter the decisions. Also, an Excel-based backend was used to administer the calculation, and the students were shown the results as slides and reports in PDF format.	Active learning strategies like problem-based learning and collaborative learning are incorporated into the general design of the simulation. The students' assignment was to debate the problem in groups, come to a consensus, and then submit their answers to an online questionnaire.	For the pupils, the hands-on group decision making (DM) and problem-solving activity seems to be a really beneficial educational opportunity. Together with a group environment, an integrated simulation of business results gives students frequent feedback and promotes analysis and critical thinking.

Table 4. *Cont.*

Study	Background/Traits	Type of Business Simulation Game (BSG)	Key Elements of Implementation	Impact/Benefits
Grijalvo et al. (2022)	Students operated a company in a competitive industry in the games Gestionet and Global Management Challenge (GMC), trying to optimize the return on their investment. They compete with organizations that operate in the same market and sell the same products.	Computer online BSG using (1) the business game website, where each team's score in the market may be viewed; (2) the instructional platform, where debriefings need to be posted; (3) online tools like Teams and Zoom were added for clarifying doubts at the group and individual levels.	The MDE Framework in gamification was used. In addition to providing a collaborative, group-driven learning environment, instructors often plan tutoring sessions and provide material from past competitions, including reports or videos.	Both BSGs used promote DM. Regarding the acquired competencies, DM varies depending on the simulator used; in Gestionet, it is viewed as a team task, whereas in the GMC simulator, information analysis is emphasized as a first step towards individual DM, which ultimately leads to team DM.
Hernández-Lara and Serradell-López (2018)	This BSG (Cesim Global Challenge) simulates a multinational mobile telecommunications firm and integrates several functional areas and focuses on strategic management, international business, global operations, and business policy.	Computer online BSG.	By using online forums, instructors can get deeper viewpoints, more helpful and less biased data, and superior knowledge to supplement the information they receive from students.	The BSG encourages DM. However, even if students have a specific strategic goal in mind when making decisions, this information does not often show up in their communication style. They appear to use a more short-term strategy, making decisions for each round based on rivals' financial circumstances from the previous round without any explicit long-term planning or objectives.
Hernández-Lara et al. (2018)	This BSG (Cesim Global Challenge) simulates a multinational mobile telecommunications firm and integrates several functional areas and focuses on strategic management, international business, global operations, and business policy.	Computer online BSG.	Whenever an issue arose within or between the students' teams, the students promptly sought the instructor's assistance and intervention. Consequently, even though the BSG might expose students to conflictual situations, they did not view it as a particularly suitable tool for improving their conflict management skills.	According to the students, the BSG's most valued generic skills were DM, leadership, and information processing. Students who have been exposed to experiential learning are more likely to value and gain from this type of tool, as well as to recognize its greater practical utility for management training.

Table 4. *Cont.*

Study	Background/Traits	Type of Business Simulation Game (BSG)	Key Elements of Implementation	Impact/Benefits
Jääskä et al. (2022)	Project Business Game is a simulation on sustainability. A challenging project task network, subcontractors, materials, and project personnel are all included in the PBG simulation model.	Computer online BSG.	Enough time should be dedicated to teaching the pupils the BSG mechanics in order to guarantee a successful learning experience. You should also spend time explaining DM theoretical concepts. Students can learn from narrative case descriptions and meaningful stories.	The BSG used improves DM capabilities. With a circular economy project example integrated into the BSG, students demonstrated a comprehension of how the produced BSG replicated the real-life phenomenon of managing project budgets, resources, stakeholders, and uncertainty.
Mannino et al. (2021)	The BSG (Emerge2Maturity) uses common elements across enterprises to break down data warehouse growth into DM steps.	Computer BSG.	To promote DM, the BSG employs two models: the Capability Assessment Model for choices about data and the Configuration Model for transition among DM phases. Debriefing discussions are also important.	DM talents are enhanced by the BSG. Students consider how realistic BSG components are, particularly the characteristics of data sources, cost-benefit analysis, the influence of outside events, and the learning impact on data warehouse development.
McKone and Bozewicz (2003)	ISM Simulation is a non-technological BSG that simulates the management of an airline company in a classroom.	It is a board game that uses a computer to assist in certain parts of the game.	It is crucial to allow for the minimum of thirty minutes for debriefing after ISM Simulation. While the debriefing session enables the facilitator to highlight important learning points and connect the lessons to the course aims, the improvement/DM sessions have given students a chance to talk about their decisions and the results.	The BSG promotes DM. It is crucial to integrate decisions both inside and outside of the simulated company. The connections between strategy and short- and long-term success or failure are highlighted by charting the relationship between strategic decisions and financial results for "winner" and "loser" teams.

Table 4. *Cont.*

Study	Background/Traits	Type of Business Simulation Game (BSG)	Key Elements of Implementation	Impact/Benefits
Mustata et al. (2017)	In the GM2 BSG, you have to manage a company by making decisions on all the different functional areas of the company.	Computer BSG.	It is important to have clear instructions from the BSG. In order to design their choices, the participants receive a handbook that gives them a general understanding of how each of these sections operates.	Students benefit from such experiences for DM because they gain real-world experience and develop critical skills without the danger of losing a lot of money in the real world.
Sakata et al. (2014)	In the BSG, Bizlator, every enterprise was an automobile that operated in the Japanese market. To teach students about the state of the Japanese market today and how events like natural disasters impact decisions about management, we simulated changes in market circumstances in a way that matched the headlines.	Computer online BSG.	BizVoice, a voice recognition assistance program was suggested to give teachers more insightful feedback on things like pupils' comprehension levels. There are some important activities like presentations and debates. Interactive lessons using the BSG are mixed with conventional lecture-based lessons.	The BSG involves developing and assessing a curriculum that would enhance students' DM abilities and enable active participation. It was successful in producing a more realistic management atmosphere.
Seethamraju (2011)	In ERPSim, each group runs a firm in the team-based game that serves as the intervention. By sending and receiving orders, delivering their products, deciding on pricing strategies, managing credit, utilizing business analytics, reporting in consecutive quarters, and finishing cash-to-cash cycles, each team engages with clients and suppliers.	Computer online BSG using SAP software.	Given the complexity of SAP software, the preparation phase for SAP in general, and for the game itself, is very important. Debriefings and group presentations are important.	The strategy seems to have been successful in providing enhanced DM and group-working skills and process orientation without becoming bogged down with the complexity of the SAP software.

Table 4. *Cont.*

Study	Background/Traits	Type of Business Simulation Game (BSG)	Key Elements of Implementation	Impact/Benefits
Yalabik et al. (2012)	In the Innovation Game, participants are tasked with establishing alignment by beginning with operational capabilities, moving on to operational decisions, and concluding with market dynamics and rival strategies. By enabling players to invest in more advanced technical capabilities (such as reduced R&D lead times and costs), the innovation game simulates these dynamics.	Board game.	It is evident how important clear instructions are, and it is crucial to have a well-organized reflection phase at the conclusion of a simulation. Using the facilitator's meticulously arranged data, participants must actively analyze what just occurred.	Benefits were particularly obtained in relation to the improvement of DM abilities (with regard to capacity and portfolio management); the cultivation of an awareness of how dynamic environments affect innovation; experiential learning through instructor feedback and reflective thinking; and the influence of other participants' (firms') decisions on their innovation strategy.
Zöbeley et al. (2011)	The BSG is based on an industrial scenario from the food sector, and attempts to raise general system awareness. It enables the recognition of the interdependencies between time-sensitive demand, order acceptance, and due date determination under capacity restrictions and significant changeover delays by adopting a process-oriented bird's-eye view of the business.	Board game.	To enable strong delivery of the essential learning, a comparatively low degree of complexity was selected for the BSG design. This involved giving up some reality, by maintaining exogenous demand.	By raising system awareness, properly aligning incentive systems, and improving cross-functional communication protocols, individual behavior under dispersed DM can be improved to meet overall corporate objectives.

4. Discussion

This systematic review has answered the following research questions: (1) what is the relation between the BSG learning experience and DM at university and (2) what elements can be developed by the BSG learning experience to promote DM?

Regarding the first research question, this study has shown that the BSGs employed have helped to increase DM, and many of their characteristics can help to promote the DM process explained by Herbert Simon's theory, which is why the results obtained in the present study are congruent with previous literature. The first step, which is called intelligence, requires collecting and evaluating data to pinpoint problems or relevant aspects, where students make decisions that are based on real-life situations. The second step is design, which requires the creation of a number of strategies to address the problems or relevant aspects; BSGs make it possible to manage connections between people and activities with the integration of information and dealing with uncertainty. The third step is choice, where students must choose the best strategy of action to address the problems or relevant aspects and in BSGs they need to develop problem-solving and collaborative skills, in a risk-free environment. The last step is review, where participants must execute the selected strategy of action, assessing and analyzing the results to guide the subsequent course of decision making, obtaining immediate feedback from the BSG.

Moreover, the selected articles show that the BSGs, apart from DM, promote different aspects such as intrinsic motivation, and learning outcomes, such as learning efficiency, teamwork, communication, analytical thinking, or strategic thinking. This is congruent with several systematic reviews that show multiple benefits in the use of BSGs where they are correctly applied (Brandl & Schrader, 2024; Faisal et al., 2022; Ferreira et al., 2021).

Regarding the second research question, independently of the design or particularity of each BSG, it is important to emphasize different elements that must be present in the process in order to develop DM skills and to link the learning objectives to the BSG to be implemented. The establishment of clear learning objectives, business management-related themes, and student groups that use games for learning also marked the beginning of the BSG learning process. Determining how game-based activities relate to the material covered in the course or class is one of the issues that must be resolved in this regard, which is consistent with previous results from another systematic review (Faisal et al., 2022). While realistic representations of real projects or occurrences are not necessary for educational games, they can help achieve learning objectives (Jääskä et al., 2022).

Furthermore, it is essential for the instructor to provide basic knowledge of the subject to be covered and clear instructions for the game and the DM the students will have to deal with (Yalabik et al., 2012). These results are congruent with another systematic review on BSGs (Faisal et al., 2022). It is relatively complex to use games and simulations for several reasons such as insufficient accounting and finance knowledge, inexperience, or a general lack of business experience and knowledge (Seethamraju, 2011). Lecturers must assume new responsibilities in addition to lecturing when it comes to planning, managing, and instructing game-based learning sessions. Thus, lecturers must devote a significant amount of time to teaching even with the most advanced simulations (Grijalvo et al., 2022). In particular, they ought to provide more assistance to students in managing risks and uncertainty. This assistance could come in the form of instruction on the inclusion and evaluation of various scenarios, some mathematical tools for estimation and prediction, DM strategies for uncertain situations, etc. (Hernández-Lara & Serradell-López, 2018).

In addition, another element that is relevant is the design of the game itself. In general, to promote DM, the components, mechanics, and dynamics of the BSG must be taken into account (Jääskä et al., 2022). It is also very important to find a balance in the complexity of the game design. On the one hand, it is beneficial to have a limited scope with few

choice variables and with little training (Endress et al., 2023), allowing students to play multiple times to see the effect and get the most out of the game, thus reinforcing student engagement (McKone & Bozewicz, 2003). On the other hand, it is also convenient to provide additional text and phases, since they may improve the likelihood of a better learning experience (Mannino et al., 2021); but care must be taken with the implementation of a BSG as it can be difficult if the game speed is too rapid especially at the beginning (Seethamraju, 2011). Further, students are required to respond to obstacles and surprises in the game design, which helps them learn how to solve problems, modify or adapt current ideas, and fosters their critical thinking abilities (Jääskä et al., 2022).

Another element to consider is the different types of activities that can be carried out in the BSG learning experience to meet the defined learning goals. The activities should have an interactive nature to encourage student involvement and collaboration (Endress et al., 2023), because BSG implementation is difficult when there is poor teamwork, communication, and collaboration (Seethamraju, 2011). Students should be provided with pre-game materials to help them prepare for the game session, thus giving them a sufficient academic basis for the subject. Moreover, it is useful to make overall presentations paying special attention to communication (Zöbeley et al., 2011) and to the discussions that will arise throughout the game. Further, students will gain an understanding of the relationship between BSG activities and real-world scenarios through the use of meaningful stories and narrative case studies (Jääskä et al., 2022). The BSG learning experience should promote characteristics such as goal-setting, conflict management, or argumentation (Mustata et al., 2017), and debriefing sessions are also very useful for this purpose as they emphasize that students' observations, experiences, and thoughts can be shared and discussed (Jääskä et al., 2022).

In addition, it is important to provide feedback on the results through reports. The possibility of quickly obtaining feedback on the process carried out in the BSG makes it possible to re-adjust decisions that have been made, evaluate consequences that have not been taken into account, or develop critical thinking skills. Students will be able to clearly see results that can later be evaluated in a group and thus promote discussion and an exchange of opinions among participants to solve any problems (Jääskä et al., 2022). In addition, BSGs allow instructors to determine the limits of their students' comprehension, helping them to teach knowledge more efficiently (Sakata et al., 2014), so they can establish fluid communication and thus have a faster response.

Finally, several studies have highlighted a few obstacles that have impaired DM in BSGs. Some teams struggled with communication and reaching decisions as a group, which negatively impacted performance (Seethamraju, 2011). In addition, even if students have a specific strategic goal in mind when making decisions, this information does not often show up in their communication style. They appear to use a more short-term strategy, making decisions for each round based on rivals' financial circumstances from the previous round without any explicit long-term planning or objectives (Hernández-Lara & Serradell-López, 2018). Also, developing proper business strategies and making acceptable business decisions based on the interpretation of reports and information proved to be difficult for the respondents (Seethamraju, 2011).

5. Conclusions

Two research goals have been achieved in this systematic review: (1) to examine the effect of BSGs on students' DM at university and (2) to identify the elements that can be developed in the BSG learning experience to promote DM. To the best of the authors' knowledge, no systematic review has looked at the two research goals of this investigation

because previous studies on BSGs had different objectives. Thus, the most important theoretical contributions of this study focus on achieving the goals listed below.

In relation to the first research goal, the outcomes of the analyzed studies suggest that applying BSG learning experiences fosters students' DM. Following Herbert Simon's theory, these BSG interventions made it possible to work on the four phases of DM (intelligence, design, choice, and review). Owing to the advantages of using a BSG learning experience, universities in a variety of academic and geographical regions are adopting this strategy more frequently. It should be emphasized that it is crucial for the development of DM to integrate information both inside and outside of the companies simulated in the games, recognizing interdependencies between variables and coordinating decisions (McKone & Bozewicz, 2003; Seethamraju, 2011). Also, since BSG decisions are usually made as a group, good communication is essential. To this end, the studies analyzed promote different initiatives such as presentations, the use of online forums, or voice recognition systems.

In relation to the second research goal, it ought to be mentioned that every study agreed that certain elements of BSG learning experiences should be suggested in light of DM development. In this study, in the discussion section, there are five key elements that need to be adhered to in order to help students enhance their DM through BSG learning experiences.

Additionally, lecturers, teachers, or instructors could use the actual implications of this study as guidance in their classrooms to enhance the teaching and learning process, as could companies where courses are given to employees and in any area where DM is to be promoted. As a result, helpful advice on how to improve DM through BSG learning experiences is included. The instructor can take advantage of the BSG to introduce tools or methods to support strategic DM, for example, explaining game-theoretic ideas like reputation, signaling, and randomized strategies (Yalabik et al., 2012). Students discover that even if there is not a single script that fits all BSG interventions, being able to make risk-free decisions in an environment which is very close to reality in which you can collaborate, improves your DM.

Although the most pertinent databases were included, it is possible that some more papers exist in other databases, and that this could be a limitation of the current study. Additionally, it is possible that some publications are available in other languages; this analysis did not include research that was not published in either Spanish or English. Also, the measurement instruments used in some investigations may have had a greater risk of bias in the research. Ignoring moderating and mediating factors that may affect how well BSGs promotes DM is another limitation covered in some of the chosen research. The present study yielded a total of thirteen publications; subsequent systematic reviews may aid in expanding the generalization of the results upon the publication of other investigations. This article can serve as a basis for future research since the scientific literature has shown that the development of DM via BSGs is an extremely important area that is still growing. As mentioned earlier, the usage of BSGs greatly impacts how students' DM develops in this area. Future studies should therefore concentrate on current tools like artificial intelligence that have educational implications. Another line of future research is the use of human–computer interfaces in BSGs, such as electroencephalography (EEG) and eye-tracking (ET) devices. In conclusion, given the diversity of the work being done to develop DM through BSGs, this is a topic that is perfect for innovation in line with the assessment recommendations.

Supplementary Materials: The following supporting information can be downloaded at https://www.mdpi.com/article/10.3390/educsci15020168/s1: Table S1: PRISMA 2020 Checklist; Supplementary S2: Standards for Assessing the Quality of Articles. Reference (Page et al., 2021) is cited in the Supplementary Materials.

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