

# Using Gamification to Develop Students As Strategic Thinkers: A Qualitative Perspective

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**Abstract:** The use of gamification as an instructional strategy has gained significant attention in recent years as a way of increasing student engagement and motivation. Gamification involves the application of game design principles to non-game contexts, such as higher education. One area in which gamification has shown particular promise is in developing students' strategic thinking abilities. This qualitative study explores university students' post-module reflections on their experience of working in teams over the course of a seven-week intensive postgraduate business analytics simulation module. Reflections were analysed using thematic analysis to identify common themes and patterns with respect to students' strategic thinking in terms of decision-making. The study findings strongly suggests that gamification, particularly the use of business simulations, can be an effective tool for developing students' strategic mindsets, in terms of the process for decision-making, impact of critical incidents, the lessons they learned and corrective action taken, along with the role of the team itself.

**Keywords:** Gamification, E-Learning, Simulation, Higher Education, Decision-Making, Strategic Thinking

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## 1. Introduction

This paper explores the potential benefits and considerations of using simulations to foster strategic thinking abilities in students across various educational settings. The use of business simulations in higher education has gained traction in recent years as a way to simulate real-world scenarios and provide students with a more dynamic and “real” experience in (team-based) strategic thinking and decision-making (Chernikova et al., 2020). Strategic thinking is defined as an individual, open-ended, intuitive, creative, and synthetic way of thinking, in opposition to strategic planning, which is perceived as somewhat analytical, collective, detailed, and sequential (Graetz, 2002; Liedtka, 1998). Simulations offer a realistic and immersive learning experience that can help students understand complex strategic concepts in a more practical and hands-on way. Moreover, it provides students with the opportunity to evaluate and reflect on the consequences of their actions, and allows them the agency to take appropriate corrective action. In doing so, they provide an opportunity to practice and develop a range of cognitive and non-cognitive competencies skills, not limited to managerial and leadership skills in strategic thinking, objective setting, decision-making, strategy implementation, teamwork, interpersonal skills, budgeting and cash-flow management and delivering customer value.

Simulations involve creating a realistic environment in which students can practice making strategic decisions. Simulations offer a realistic and immersive learning experience that can help students understand complex strategic concepts in a hands-on way. Coupled with this is the provision of a “safe” learning environment to practice decision-making and evaluate the consequences of their actions, thus empowering students to become more confident and competent strategic thinkers. By incorporating game design principles into educational activities, students can become more engaged and motivated to learn, while also developing important competencies and skills necessary for success in the workforce.

One of the primary advantages of gamification in higher education is its ability to boost student motivation and engagement (Dicheva et al., 2015; O'Brien & Costin, 2022). By incorporating game elements such as challenges, goals, rewards, and progress tracking, gamified learning creates a sense of excitement and purpose. Students are more likely to actively participate, explore course content, and invest greater effort when learning becomes enjoyable and meaningful. Gamification taps into students' intrinsic motivation, driving them to pursue learning objectives with enthusiasm and perseverance. It also encourages active learning by requiring students to participate, solve problems, and make decisions. This active involvement promotes critical thinking and problem-solving skills, as students analyse situations, consider multiple perspectives, and strategise to achieve desired outcomes. Through gamified activities, students are challenged to apply theoretical knowledge to real-world scenarios, fostering a deeper understanding of complex concepts and enhancing their ability to think critically and creatively (Dicheva et al., 2015; Costin et al, 2018; O'Brien & Costin, 2022).

Gamification further facilitates the provision of immediate feedback, enabling students to monitor their progress and adjust their learning strategies accordingly (Karamert & Kuyumcu Vardar, 2021). Real-time feedback helps

students identify areas for improvement, reinforces positive behaviours, and motivates them to strive for continuous growth. By visualising their progress through game mechanics like experience points, levels, or badges, students gain a sense of achievement and accomplishment, which further enhances their engagement and satisfaction with the learning process. Gamification also promotes collaboration and social interaction among students (Alzahrani & Alhalafawy, 2022). Many gamified educational platforms incorporate multiplayer features, encouraging students to work together, communicate, and share knowledge. Through team-based challenges and competitions, students develop cognitive competencies in the essential elements of teamwork, communication, and leadership skills (O'Brien & Costin, 2022).

## 2. Considerations for Effective Simulation-Based Learning

Effective simulation activities should align closely with the desired learning objectives and outcomes (Brazhkin & Zimmerman, 2019) and so educators must carefully design or select simulations that address specific strategic thinking competencies, ensuring relevance and applicability to the targeted domain or discipline. Clear articulation of learning goals and outcomes will guide the selection of appropriate simulations and facilitate the assessment of student progress. The availability of accessible and user-friendly simulation platforms is crucial for seamless integration into educational settings. Institutions should invest in appropriate technologies and resources to support simulation-based learning initiatives. User-friendly interfaces and intuitive controls enable students to focus on the strategic thinking aspects of the simulation rather than grappling with complex technical issues.

Effective facilitation and debriefing are essential components for consideration in simulation-based learning. Educators play a crucial role in guiding students through the simulation process, setting expectations, and providing necessary guidance and support (O'Brien & Costin, 2022), moving from the *"sage on the stage, to the guide on the side"*. Post-simulation debriefing sessions allow for reflection, discussion, and the extraction of valuable insights from the experience. Facilitators can help students connect their simulation experiences to real-world contexts and reinforce strategic thinking concepts. Simulations should be scalable and adaptable to accommodate diverse educational contexts and student populations and should be flexible enough to cater to different levels of complexity and accommodate various group sizes.

## 3. Gamification as a Mode for Developing Strategic Thinking

A number of authors (Washbush and Gosen, 2001; Faria et al., 2009; Wood et al., 2009; Williams, 2011; Costin et al, 2018; O'Brien & Costin, 2022) advocate the use of simulation games as an innovative pedagogical approach to teaching entrepreneurial competencies thus developing a more strategic mindset. Simulations offer students the opportunity to engage in *experiential learning*, where they actively participate and learn through direct experience (Kolb, 2015). By simulating real-world situations, students can explore complex problems, experiment with different strategies, and observe the outcomes of their decisions in a controlled environment. This hands-on approach enhances their understanding of cause-and-effect relationships, helping them develop a deeper appreciation for strategic thinking (Kolb, 2015). Fox et al., (2018) reports that simulation games engage students in realistic activities designed to increase knowledge, improve skills, and enable positive learning outcomes, which in turn promote learning. Further, simulations reflect and mirror the imperfect nature of business environments- a useful resource for entrepreneurial learning.

Simulations often require students to *collaborate and work in teams*, mirroring real-world collaborative settings (Chernikova et al., 2020; O'Brien & Costin, 2022). Through teamwork, students develop essential skills such as communication, negotiation, conflict resolution, and leadership. Collaborative simulation exercises enable students to understand the complexities of working with others, appreciate diverse viewpoints, and leverage collective intelligence to develop effective strategic plans. Furthermore, simulations provide a structured framework for reflection and feedback, facilitating the integration of theory and practice. After completing a simulation, students can analyse their decisions, evaluate their outcomes, and reflect on their strategic thinking processes. Instructors or peers can provide constructive feedback, highlighting strengths and areas for improvement. This reflective feedback loop enables students to refine their strategic thinking skills over time and enhance their decision-making abilities. Simulation games allow for an embedded approach to entrepreneurial learning, fostering students to become more skills-oriented, thus encouraging them to develop entrepreneurial competencies such as *passion* and allowing them and opportunity to develop their unique entrepreneurial identity (Costin et al, 2018).

Simulation also features a team-based approach, a focus on value creation, connecting students to the outside world and letting students act on their knowledge and skills, resulting in deeper learning. Such pedagogy extends the notion of real-world learning and immerses students in the realities of managing the interlinked functions of starting and managing a business, managing people and resources and applying leadership and role of strategies in uncertain and unpredictable environments, and the associated cognitive and non-cognitive competencies necessary for success.

Business Simulations are a useful mechanism to provide practical and immersive experiences to develop their conceptual understanding in cross-functional decision-making and analytical thinking abilities (Costin et al., 2018; O'Brien & Costin, 2022). Business simulations are advocated as an important catalyst and an effective pedagogy to enable the development of entrepreneurial competencies by providing opportunities for multiple cross-functional assessments and personal reflection to perform in an entrepreneurial/manager role.

#### 4. The Research Approach

Business simulation games are representations of real business situations in a virtual environment/world. Business simulation games enhance learning experiences (Matute & Melero, 2016) by providing a context in which students *learn by doing* (Caulfield et al, 2012). The following two sections describe the background context of the study, the simulation game used, along with how the data were both collected and analysed.

##### 4.1 Context of the Study

The Business Simulation module is a capstone module designed for postgraduate students completing a taught MSc degree in Business Analytics. For the most part, these students come from non-business backgrounds. The module is designed to reflect the reality of all the issues linked to entrepreneurial start-up and business growth and emphasises the development of critical thinking, decision-making and problem-solving skills. Students are challenged to think and navigate their way through all the problems and constraints presented within the game to integrate concepts successfully, cross-functionally, and from financial and non-financial perspectives.

The simulation game used for this research is 'SimVenture Evolution' (see Fig. 1). SimVenture Evolution requires logical reasoning to unravel many complex scenarios, while at the same time enabling students to monitor their progress through appraisals, as well as saving and loading simulations. The game facilitates the development of analytical thinking skills by making demands on students in a captivating and real-world manner. Instructors facilitate rather than teach to foster an inquisitive, creative and analytical mind-set, building self-confidence, and promoting teamwork.

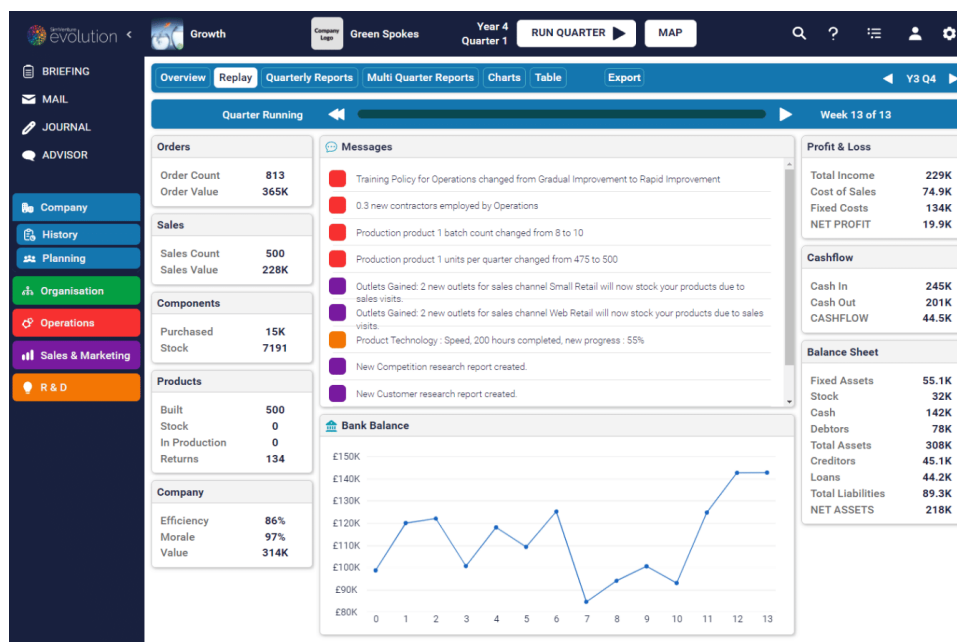


Figure 1: The SimVenture Evolution Interface

The game enables users to setup and run their own virtual company and test their knowledge about all aspects and functions of a business. At the heart of the game are the decisions made on the part of the student. The reality of the simulation combined with the on-screen information makes it a rich learning resource. In SimVenture Evolution, the user (student) is essentially an entrepreneur assembling and selling bicycles. The game commences at a pre-determined month, when the business is already several months in operation. It is the job of the student/student teams to generate a profit and a sustainable strategy for the company going forward. The core areas of the business are Sales and Marketing, Research & Development, Operations, Finance and Organisation. When a team plays the game, it is ultimately the team's responsibility to identify individual strengths and weaknesses and allocate roles accordingly. On completion of the game, the intention is that students should be able to demonstrate the ability to select and apply appropriate analytical decision-making techniques in an integrative manner, against a simulated complex business environment.

## 4.2 Data Collection & Analysis

A major part of the assessment for this module was a team reflection where students were required to consider and address the following themes:

1. Process for decision-making.
2. Critical incidents.
3. Lessons learned and corrective actions.
4. The Role of Team.

A qualitative research approach was carried out in the form of content analysis to identify the significant issues that arose under the key themes in the team reflections.

## 5. Research Findings

This section presents an analysis of the student (team) reflections within the framework of the four themes outlined in Section 3.2. By examining the data through a meticulous lens, it aims to offer meaningful interpretations, observations and conclusions based on the students' perspectives and experiences.

### 5.1 Theme 1: Process for Decision-Making

The findings highlight that the process for decision-making did not remain static through the student's progression in the simulation. At the outset, students observed that they had made "knee-jerk" and "simplistic" decisions, "not giving enough thought" to all the variables at stake and not taking into account the impact and the "domino effect" these decisions would have on the business. Having acknowledged this, it appeared that students experienced a very steep learning curve and made a team decision to put a process in place in terms decision-making, with some going as far as documenting the various stages the team should consider going forward. One team commented that

*"a decision-making process should be followed to clearly understand all the outcomes a decision may have. After trialling different processes, a process was agreed upon due to its simplicity and effectiveness".*

Alike, another team reported that their "decision-making process is broken down into four cyclical steps: plan, prepare, simulate, and improve. We are happy to report that by following this decision-making process, the company produced excellent results".

Coupled with this were students' realisation that they needed to "maintain an unclouded vision of the business" and this could only be achieved through "a decision-making process that depended on understanding all aspects of the business to understand the consequences of our decision-making". This was echoed by others who admitted that they "needed to develop their decision-making skills and gain a more holistic view of the simulation. Using and leveraging data analytics, and conducting in-depth research on both internal (e.g. sales and marketing) and external issues (i.e. competition in the market) was realised by students as issues that require consideration, and were influential in them in making more objective, strategic and non-bias decision, with one team enforcing that

*"it all comes down to the numbers....our new decision-making process requires us to download tables to excel and analyse trends within the data such as sales. This allowed us to have non-biased data which can highlight positive or negative trends and the impact they will have on our decisions".*

Others cited that

*"While prior experience was a key component in our decision-making process we downloaded quarterly reports of company metrics.....this rapidly became our favourite and most utilised feature, allowing us to leverage data analytics to visualise data and execute decisions based on data, rather than intuition".*

Similarly another group reported that

*"the combination of extensive market research, data driven analysis, and research by the team turned out to be the leading resource in our successful decision-making".*

This sentiment was reinforced across the cohort of students where others commented that one should *"Never rush in making decisions and invest in time for learning"* and *"Do not guess- research is necessary"* evidently showing students had developed their critical-thinking skills and had moved away from impulsive and rushed decisions.

## 5.2 Theme 2: Critical Incidents

Research findings highlight that the occurrence of critical incidents had an impact on students strategic thinking capability and brought them to the realisation that decision-making is not a seamless and linear process. At the outset, the data shows that students appeared to be very much in their *"comfort zone"* and they *"were doing perfectly fine and the decisions they were making were working really well"*. Respective teams reported they were making decisions on *"product improvements and modifications"*; *"introducing new products"*, *"improving our technology"*; *"we were able to fully take control of economies of scale, decreasing time in production with automation and large numbers of batches"*, however this positive attitude and confidence was short-lived as teams were challenged by a critical incident, in the form of introducing competition and competitive strategies to the game. The students were challenged to react and make tactical and strategic decisions about the business' competitive position, taking into account the competitive landscape. This brought to the fore varied and mixed feelings and responses from student teams. Some teams felt *"stupid that they didn't see this coming"*, *"it was all going to well!....we should have known"*. It was interesting to note that some student teams had a defeatist attitude at this point and *"were lost"* and were *"doubting everything they had done to date"*, and didn't seem sure how to progress, *"don't know where to go from here"*, however others displayed a more positive attitude and commented that this *"was just a micro failure"* and addressed it by *"organising a meeting to improve their strategy and implement new decisions based on the changes in the marketplace"*. Others indicated that

*"This is the first time our company made the wrong decision so we were disappointed and confused.....nevertheless, we were determined to locate the root of the problem"*.

In addition, the findings highlight perhaps a level of naivety and misplaced confidence amongst the students with regard to the level of consideration they gave to the influence of external factors as having an impact on their decisions. Student reflections demonstrated that they *"were so busy looking at sales"* they *"never stopped to think what competition was doing"*, others indicated they *"forgot about the external factors and based all their decisions on internal issues like training our people and bringing down the price"*. This critical incident highlighted to students that the business landscape is volatile, dynamic and uncertain and even when a decision-making process is in place, unplanned and uncontrollable critical events can disrupt even the most researched decisions. While this can be deemed a negative experience for students, the critical incidence developed their strategic thinking capability, making them aware that in making decisions, there are numerous factors at play, both controllable and uncontrollable, that need to be considered, echoed by a team that *reported that "now we know that "keeping up with the competition is an absolute must and we need to readjust our marketing strategy which is key to keeping the business afloat"*.

## 5.3 Theme 3: Lessons learned and corrective actions

As expected numerous lessons were learned across various levels in the simulation and positively influenced impacted on the corrective action taken by the teams, clearly evidencing progression in how students made strategic decisions. Evidently students had developed in terms of their critical thinking skills and had gained the knowledge and insights necessary to make sound and more insightful strategic decisions evidenced through their various reflections. One team in particular indicated that they *"became aware of numerous on-going issues and we were unable to pinpoint what exactly the root of the problem was"*. They tackled this by having completing *"detailed analysis"*, *"holding lengthy discussions"* and discovered that:

*“the issue surrounding inadequate demand must lie within the sales and marketing department.....As a result, we decided to take a more aggressive strategic approach towards our sales channels, promotions, and branding to stimulate demands”.*

They also decided to *“minimise risk associated with a shortages and we to put our remedies to the test”*. Through student reflections, a logical and more in-depth train of thought is depicted resulting in a positive change in the organisation and appropriate corrective action being taken. This particular team highlighted that *“Within one quarter of making the desired changes, we noticed an instant improvement in all financial/performance outputs”*.

Experiencing and dealing with failure emerged as a key lesson learnt. When students initially engaged with simulation, there was a sense of *“frustration”* and *“discontent”* and they seemed quite *“disheartened”* when their decisions did not work. Nonetheless, the students transitioned from this state and came to an acceptance of failure and moved beyond it very quickly, showing a new confidence and resilience, reflected by one group, *“this was a game failure as a team and although we were shut down by the bank, we took many positives from this and we improved drastically as a result of next decisions....feeling more confident”*. Similarly another team reported that *“failing, presented us with opportunities to learn from our mistakes by means of preventing them in the future as well as making more informed business decisions. It wasn't a coincidence when our best company performances were directly after carefully deciding game rewinds as a result of disappointing failures”*.

The simulation also allowed the students to engage in experiential learning, experiencing the *“lived”* business world of entrepreneurs in making decisions, albeit in a simulated world, echoed in their observations,

*“the simulation was a very good exercise to understand a real business scenario and practice decision-making essential for operating a company. It offered a very deep perspective into the challenges of business growth and would be an aid while practicing in the industry”*.

Similarly another group cited that,

*“It has given more lessons than any theory could possibly give..... lessons were not only limited to running a company but also working with different individuals to realise a common goal”*.

The lessons learned and corrective actions theme also highlighted students understanding of how decisions are interlinked and have both direct and indirect effects across all functional areas of the business, *“no decision is ever made in isolation – everything has knock-on effects”* again benefitting and developing them as strategic thinkers. Observations from teams highlighted that *“we quickly determined that running out of space often had the most detrimental consequences on the business. Not only did it prove to lead to massive inefficiencies in each department, but it also incurred a noticeable financial cost....and so was a key part in maintaining production to meet demand”*, while another team highlighted the connection between quality, sustainability, cash flow, employee morale and stakeholder satisfaction clearly demonstrating their understanding of the connected and integrated nature of their decisions, reflected through the following observation,

*“In terms of location, quality and sustainability, we always choose excellent quality, as we believe that keeping our employees in the best working environment possible will increase morale, and in turn their overall capability...also it makes the most financial sense to focus on sustainability as we discovered later, employee morale and sustainability directly influence stakeholder satisfaction with the company”*.

Interestingly, the topical and contemporary issue of sustainability featured again as a lesson learnt for students, with emphasis placed on its importance in terms of building and growing a business-

*“The firm has built itself a reputation of being an ethical and sustainable company which employees strive to work for, other companies aim to work with, and customers want to buy from. As a result, this image is imperative to keep up, so ensuring the premises, suppliers and new designs never compromise in sustainability is essential”*.

The benefit of hindsight also emerged as part of the students development of as strategic thinkers, and added to this perhaps the acknowledgment and admittance that they had made incorrect decisions. Nevertheless, the learning experience was positive and students had gained the necessary knowledge and experience to make better and more informed future decisions, reflected by one team who admitted that

*“while we were “aware that enough workspace, quality facilities, manufacturing capacity, batch size, and sufficient training are important factors in achieving higher efficiency values, we discovered that, due to our overly ambitious nature, we designed a new product (that was never launched) in the market”*;

*however, to manufacture that new product, we overloaded our resources, lowering our efficiency level..... If we do get the chance to correct this, we will strive to make better decisions so that unwanted innovation is avoided and employees are not overworked, allowing for increased efficiency”.*

#### 5.4 Theme 4: The Role of Team

Research findings also point to the significant role and influence of the team in strategic decision-making. The critical success factors of the team included “collaboration”, “cooperation”, “consistent communication”, “inclusivity”, and “group and shared centred decision-making”. There was a realisation from all the student teams that all these elements were “crucial” to the projects’ success, with some teams adopting a formal approach to team management:

*“At the outset, we drafted a team charter with a code of conduct and participation, communication, and problem-solving expectations that we all agreed to follow”.*

Additionally, students provided all individual team members the opportunity to share their opinions and their rationale for their choices, with reflections highlighting that “it was crucial for us as a Team that everyone got the chance to voice their concerns” and “at no point was an opinion discarded, much like an open forum it was worked through and taken on board for future decision-making”. Team efforts were made to have “balanced debates on the strategic decisions being taken” and for some, “the key to a success is not just individual gut-based decisions but more informed and carefully thought-out team plans”. Clear and consistent communication was also very important “ensuring that everyone knew exactly what was happening” demonstrating high levels of commitment and cooperation within the team, with one team showing how they would “as a team discuss and develop an overall strategy while constantly having mini brainstorm sessions to iron out kinks and improve the overall efficiency of the firm”. This was echoed by others who indicated that “throughout the simulation the team dynamic was one of open discourse and discussion....disagreements were encouraged to provide alternative opinions and experiences. Students also realised that

*“running a business is not an easy task and so multiple minds are required to manage different areas.....difficult for just a single person to manage and so collaboration helps us all to address those gaps and provide different advice to each other in a supportive manner”.*

## 6. Conclusion

Simulation games have gained significant popularity in recent years as a powerful tool for learning and development. These games provide a virtual environment where individuals can engage in various scenarios and make decisions that impact the outcomes. One area where simulation games have shown remarkable effectiveness is in developing strategic thinkers.

Strategic thinking is the ability to analyse complex situations, anticipate future outcomes, and make decisions that align with long-term objectives. It requires a combination of critical thinking, problem-solving, and decision-making skills. Simulation games offer a unique platform for individuals to practice and enhance these abilities in a dynamic and engaging manner.

Through simulation games, players are exposed to a wide range of variables and uncertainties, forcing them to think critically and strategically. They must analyse information, assess risks, and consider multiple perspectives to make informed decisions. This cultivates a habit of thinking strategically and encourages individuals to adopt a holistic view of the situation, considering both short-term gains and long-term consequences. Moreover, simulation games promote collaboration and teamwork, which are essential components of strategic thinking. Many simulation games are designed for multiplayer experiences, requiring players to communicate, coordinate, and collaborate with others to achieve shared objectives. This fosters skills such as negotiation, consensus-building, and adaptability, which are vital in strategic decision-making processes.

Furthermore, simulation games often incorporate dynamic and evolving environments, reflecting the ever-changing nature of real-world challenges. Players must adapt their strategies in response to unexpected events and shifting circumstances. This develops resilience and flexibility, key attributes of strategic thinkers who can adjust their plans and approaches to achieve their goals in dynamic and uncertain environments. The benefits of using simulation games to develop strategic thinkers extend beyond individual skill development. Organisations can leverage these games for team building, leadership development, and strategic planning exercises. By simulating realistic scenarios, teams can collaboratively explore different strategies, test assumptions, and identify potential pitfalls before implementing them in the real world.

In conclusion, as demonstrated in this study, gamification offers a powerful tool for developing strategic thinkers. Simulation games provide an experiential learning environment where individuals can practice strategic decision-making, learn from their actions, and adapt their approaches. The immersive nature of such games, coupled with their ability to simulate complex and dynamic scenarios, enhances critical thinking, problem-solving, and decision-making skills. Moreover, the collaborative and team-based nature of simulation games cultivates skills in communication, negotiation, and adaptability. As organisations continue to recognise the value of strategic thinking, simulation games offer a compelling and effective means to develop this crucial skill set.

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