Simulation-Based Thinking

Idea In Short

Real decisions come with real costs, and most cannot be repeated. A simulation gives you something rarer: a model in which you can act, watch the consequences, and try again. Business simulations, from board-based games to computer models of whole companies, have trained managers for decades. Simulation-based thinking extends that habit into daily work, so that you test options against a model of the situation before you commit. This article explains what simulations are, what research says about their learning benefits, how to run one well, how to debrief it, and where simulations mislead when people trust the model more than the world it describes.

A retail executive faces a choice between opening three small stores or one large one. Spreadsheets give two confident answers that disagree. She builds a simple model of foot traffic, rent, and staffing, then runs ten variations in an afternoon. The choice does not become obvious, but she learns which assumptions drive the result, and that knowledge shapes the questions she takes to her team.

What simulation-based thinking means

Simulation-based thinking is the practice of trying actions inside a model before trying them in the world. The model can be a spreadsheet, a board game, a computer program, or a structured role play. What matters is that you can act, see consequences, and repeat.

Wikipedia defines business simulation as simulation used for business training, education, or analysis, and notes that it can be scenario-based or numeric-based. The article lists learning objectives such as strategic thinking, decision making, problem solving, financial analysis, market analysis, operations, teamwork, and leadership.1

This article treats simulation as a broader thinking habit. An earlier article in this series covered mental simulation inside one person's head, and another covered scenario play, in

which people act out competitive moves. Here the focus is the explicit model that a team can build, run, and inspect together.

How business simulations work

The same Wikipedia entry cites researchers who describe a business game as a sequential decision-making exercise structured around a model of a business operation, in which participants take the role of managing the simulated operation.

A participant usually joins a team of managers or planners. The team makes a round of decisions, the model calculates results, and the team reviews outcomes before the next round. Business strategy games aim to build decision skills, especially under limited time and information.

A separate overview of training simulations says companies around the world regularly use them to teach employees, and that the first commercially available training simulation appeared in 1956 as The Top Management Decision Game from the American Management Association.2 The tool has a long history, and nearly all simulations now run on computers.

What research says about benefits

A paper in the proceedings of the Association for Business Simulation and Experiential Learning from 2019 describes business simulations as a type of experiential learning that prepares students for workforce skills. It lists critical thinking, decision making, business acumen, and leadership among its keywords, and describes formats that include computer-based, web-based, and board-game versions.3

A scholar at the Open University adds that more learning takes place when people learn collaboratively, and that some evidence suggests a competitive element may enhance learning. The author also describes simulations as dynamic case studies that respond in real time to decisions, which helps learners analyze data, solve problems, and reflect on mistakes.4

Treat these as indications and not guarantees. The research cited is mostly from education settings, and results in a specific company will depend on design and use.

Quality varies widely

Not every simulation teaches well. A study in the International Journal of Serious Games reviewed the business simulation literature and interviewed 17 simulation companies. It reports that some simulations vary widely in quality and learning outcome, and it identifies research gaps such as the effectiveness of avatars and the benefits of competing against other teams instead of the computer.5

For a buyer or a designer, the lesson is to test a simulation before relying on it. Check what the model assumes, how it handles surprises, and whether its feedback explains why outcomes occurred.

A weak simulation can teach the wrong lesson with great confidence, so evaluate it as you would evaluate any analytical tool.

Designing a useful simulation

Start with the decision. What choice do you want to improve, and what would a good outcome look like? A model built without a decision in mind tends to grow complicated and answer nothing.

Next, decide which variables matter. Include the few drivers that most affect the outcome and leave out detail that adds noise. A model with five well-chosen variables often teaches more than one with fifty.

Then set the rounds. The ABSEL paper lists prework, a briefing, a software demonstration, decision-making rounds, and results review as typical stages. Follow a similar rhythm, even for a homemade model: prepare, brief, decide, review.

Finally, make consequences visible and quick. Learning improves when people see the effects of a choice soon after they make it.

Running a simulation with a team

Mix the team. Include people from finance, operations, sales, and any function the decision touches. A cross-functional group sees more of the model's blind spots, and a 2015 ABSEL

paper on leading business simulations reports that they help build a cross-functional understanding of business.

Assign roles with care. In a role-based simulation, give each person responsibility for a part of the model, so that conflicts of interest appear inside the exercise and not later in the real project.

Keep time pressure realistic. If real decisions come with deadlines and incomplete data, the simulation should too. Practice under such conditions builds judgment that transfers.

The debrief matters most

Playing the simulation is only half the learning. The debrief turns experience into insight.

Ask what the team expected, what happened, and why the two differed. Look for assumptions that proved wrong and for decisions that looked good only because of the model's simplifications.

The Open University author notes that facilitators often give feedback on the quality of teamwork and decision making. Use that feedback. Ask how the group shared information, who spoke up, and what it ignored.

Then write down two or three changes to make in real decisions. A debrief that ends without a commitment rarely changes behavior.

When to simulate

Simulation pays off when real experiments cost too much, take too long, or cannot be undone. A patent on management training simulations makes the same case in its background section: business experiments are not repeatable, decision consequences reflect many influences, and the penalties for failure are potentially high.

Good candidates include pricing changes, capacity expansions, supply chain redesigns, and organizational restructures. In each, a wrong move is expensive, and a model lets you explore before you commit.

Skip simulation when a quick real test is cheap. If you can run a small pilot in a week, the pilot gives better evidence than any model. Simulation and experiment work best as partners, with the model narrowing options and the pilot confirming the choice.

A hypothetical example

Imagine a hypothetical logistics firm deciding whether to add a second regional hub. The planning team builds a simple model with demand growth, trucking costs, and hub capacity, and runs it under three demand scenarios. In two of the three, the second hub pays back. In the third, a demand dip leaves both hubs half empty.

The debrief shows that the answer depends heavily on how fast one large customer grows. The team decides to negotiate a volume commitment before building, and to stage the hub in two phases. The firm and numbers are invented, but the case shows how a simulation can reveal which assumption carries the decision.

Cautions

A model is a simplification. Check it against reality, and update it when evidence contradicts it. Do not defend a decision by pointing to the model alone.

Avoid false precision. A simulation that outputs a figure to two decimals can create confidence that the inputs do not justify. Present ranges and name the main uncertainties.

Finally, remember that people can game a simulation. If participants learn the model's quirks, they may optimize for the game and not for the real world. Vary the scenarios and review whether the lessons hold outside the model.

- 1Business simulation
- 2Training simulation
- 3Business simulation and experiential learning, ABSEL 2019
- 4Business simulation: stimulation for business learners, Open University
- 5Best practices in business management simulations, International Journal of Serious Games

Summary

Simulation-based thinking means experimenting with possible actions inside a model of a situation, so that you learn from consequences before real stakes arrive. Business simulations present managers with lifelike situations, show the results of their decisions, and let them try again. Studies describe benefits that include better decision making, cross-functional understanding, and teamwork, and also note that quality varies widely. The value depends on a realistic model, a clear learning goal, and a careful debrief. Choose one decision you face this quarter, build the simplest model you can, run three variations, and write down what surprised you. Then share the results with a colleague who sees the problem differently.