Simulation games and problem-based learning

Teaching & Learning

teach.cbs.dk / tl@cbs.dk

Photo: Bjarke MacCarthy

TIP: If you are considering using simulation games on your course, start by reading about the experience of other teachers at CBS below and reviewing the available solutions presented below. Then book a meeting with one of the T&L consultants who can help you frame the simulation so it aligns with the learning objectives of your course.

Problem-based learning (PBL) is defined as an instructional learner-centred approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem (Savery 2006).

Among its key elements are

- **ill-structured problems** that are presented as unresolved

- **authenticity** as the basis of problem selection

- **student agency** to derive the key issues of the problems they face, define their knowledge gaps, and pursue and acquire the missing knowledge, and

- **teachers acting as facilitators** and tutors that guide students by asking them meta-cognitive questions (Barrows 2002).

Simulations and PBL

PBL is centred around authenticity. However, real-world situations can have multiple influencing factors leading students away from the productive line of enquiry. Simulations can be very effective in framing the problem so students are directed to take a particular discipline-relevant perspective that is based on the real-world contexts.

The simulation's structure can also offer both teachers and students a more step-like approach to PBL so curriculum goals are met by focusing the line of inquiry in a way that allows students to gradually develop higher-order skills and more advanced knowledge.

Finally, within the PBL structure, the simulation takes on the role of the primary instructional strategy rather than a supplementary aid to a traditional lecture. Here, learning becomes student-driven as the simulation creates a "need to know" content knowledge required for its execution (cf. Maxwell et al 2004).

Benefits for learning

Simulations

- engage student interest by making a clear connection to the relevant professional contexts, at times enhancing the motivation further through competitive elements. This contributes to students developing deep learning strategies and avoiding surface learning.
- create multiple feedback opportunities.
- facilitate the development of skills that are directly relevant to the students' prospective career, including collaboration and attention to different layers involved in decision-making.

Challenges

And yet, simulations would not work for everyone and in every context! They often require a lot of time and effort in terms of activity preparation. Digital simulation tools are particularly resource-heavy and require teachers to become proficient users of the platform before introducing it to students.

Students positively comment on the extensive feedback they receive during simulations. This requires continuous active involvement from the teachers who need to keep a close look at the developments to ensure that all students can progress in the game. At the same time, the game develops differently depending on the decisions student take, which means that questions that might arise could be very widespread and the whole class feedback might not be possible.

Available formats and practical advice

Simulation-based courses

To give students the full benefits of simulation-based learning, some courses at the Marketing department have been fully centred around simulation games that are open to students throughout the course. On these Master level courses, students are invited to participate in an industry-relevant game that allows them to integrate and apply knowledge from previous courses. This pre-requisite knowledge is then supplemented by lectures (live or pre-recorded) and relevant reading materials. The simulation itself is carried out as a group activity and the groups are provided with frequent feedback on their progress. The teachers have an overview of the groups' progress that allows them to offer focused guidance, steering groups away from making detrimental decisions.

You can read more about Sylvia's experience on the Contribution blog, and about Torsten's course setup in his account of practice.

Practical tips: The simulation games used in these two courses are Pharmasim and Stratsim, both developed by *Interpretive Simulations*. The simulations run on the dedicated platform and have an associated cost per person. If set up as group work, this can be facilitated through Canvas groups.

Mini simulations

Shorter simulation games can be brought in to support concept learning and application in individual sessions. Although these lie outside the PBL frame per se as students do not have the same amount of agency in defining their knowledge gaps and independently developing strategies for knowledge construction, these could add to the positive learning experience and promote deep learning through engaging student interest.

➔ Use an online game (e.g., the Beer Game or check out Great Ideas for Teaching Marketing who have created a free marketing and positioning simulation game. This game can be adjusted to the needs of the instructor and includes videos for instructors (how to run the game) and students (how to play the game)).

➔ Build your own simulation (e.g., you can watch this YouTube video for a step-by-step tutorial on how to create a Monte Carlo simulation in Excel)

➔ Find out if the core textbook on your course has an associated simulation game available through the publisher's adaptive reading platform. Find out more about marketing simulation games from the McGraw Hill and Pearson publishers.

References

Barrows, H. (2002). Is it Truly Possible to Have Such a Thing as dPBL?, *Distance Education*, 23(1), 119-122.

Maxwell, N., Mergendoller, J. & Bellisimo, Y. (2004). Developing a problem-based learning simulation: An economics unit on trade. *Simulation & Gaming*. 35. 488-498.

Savery, J. R. (2006). Overview of Problem-based Learning: Definitions and Distinctions. *Interdisciplinary Journal of Problem-Based Learning*, 1(1). Available at: https://docs.lib.purdue.edu/ijpbl/vol1/iss1/3/