Business wargaming for teaching strategy making

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A R T I C L E   I N F O

A B S T R A C T

An increasingly complex and dynamic business environment requires new approaches to teaching strategy to management students. Business wargaming, a dynamic strategic simulation, is discussed as a management simulation which can respond to the contemporary challenges in management education. Reflecting on the practical use of business wargaming in the classroom, it is described how such simulations prepare management students for making strategic decisions in complex and dynamic environments characterised by high uncertainty concerning the future.

1. Introduction

Organisations have in the past been urged to develop foresight [e.g. 1, 2] and accordingly a variety of approaches and concepts, such as futures studies, strategic, corporate or organisational foresight, trend research, strategic early warning systems, strategic issue management or scenario planning have emerged. In particular scenario planning [3–6] has gained increasing recognition [7] in corporations as a tool to develop alternative pictures of the future.

However, how has this notion of developing foresight in order to deal with complexity and uncertainty, in particular in respect to the future, translated into the education of management students? Schoemaker [8, p. 119] argues: "The traditional paradigm of business schools, with its strong focus on analytical models and reductionism, is not well suited to handle the ambiguity and high rate of change facing many industries today". Increasingly master programmes on futures studies or executive education on scenario planning or corporate foresight are offered at universities, the question remains how to further integrate futures thinking into the education of management students, besides only mentioning scenario planning as a relevant tool for strategy development.

While it has been argued that simulations have positive effects on learning [e.g. 9, 10], it appears that simulations, in their various formats, are appropriate for educating management students, in particular if these simulations are future oriented and therefore expose management students to futures thinking. This paper introduces and discusses a specific from of simulations, which appears to be very well suited to familiarising management students with strategising in a dynamic and complex environment. This points to *business wargaming*, which can be perceived as a dynamic strategic simulation.

In the following, it will be demonstrated that an increasingly complex and dynamic business environment requires new approaches to teaching strategy to management students. The role of simulations in management education will be discussed, followed by an introduction to business wargaming. Experiences with the use of business wargaming in the classroom will then be presented.

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2. Challenges for management education

The critics of MBA programmes [e.g. 11, 12–14] have in return been criticised for not providing evidence to support their claim [15]. Schoemaker [8, p. 122] makes the point "that the MBA culture, includes a rational, reductionism mindset that serves business well in time of stability but not when discontinuity is upon us and entrepreneurship is called for". Schoemaker [8], who has published widely on issues such as scenario planning [5,6] and on Ansoff's [16] concept of "weak signals" [17–21], has emphasised the need for dealing with uncertainty and complexity and has argued in favour of a new approach in management education. This approach should focus on the management of uncertainty and paradox, which includes dealing with weak signals of change and thinking about alternative futures, in contrast to analysing well-structured risks or tradeoffs.

In respect to teaching, Schoemaker [8, p. 128] draws the following implications:

- "Improve the blending of clinical and research-based faculty and topics
- Adopt a problem-centred teaching approach, using real world challenges
- Encourage cross-disciplinary instructor teams who co-teach all classes
- Bring in speakers from industry and government to add richness and context
- Make students co-creators of the educational content and the learning experience
- Foster student teamwork on real cases; reward student leadership and creativity".

A further challenge in management education can be assigned to the field of critical management studies [22]. In education, the aim of critical management studies "appears to be the development of more reflective managers able to appreciate the impact that power and politics have on their relations with others" [23, p. 65]. Prichard [23] argues that the question at hand, when it comes to engaging students into critical management studies, is about how this can *actually* be achieved. In this realm, Prichard [23] points to critical action learning [22], as a way to explore the emotional and political dynamics in organisations.

Casey and Goldman [24] underline the relevance of teaching management students how to think strategically. They argue that strategic thinkers "have been described as analytical, intuitive, reflective and creative [24, p. 41]". This reiterates the assertion that these characteristics are believed to be important for developing new perspectives and identifying new possibilities.

Reynolds and Vince [22, p. 442] describe another challenge in management education, by making the argument that the connection between education and innovation has become important in several ways: "Innovation is inextricably tied to management education in terms of developing, capturing, sharing, distributing, and making the most of existing skills and knowledge as well as in providing clues to the strategic development of future skills and new or desired knowledge."

Before discussing how business wargaming can respond to these challenges in management education, the next two sections will describe the application of simulations in management education in general and will then introduce business wargaming.

3. Simulations in management education

Why use simulations in management education? Simulations have been credited with having positive effects on learning [25]. The use of simulations in education, and especially in military training, has a long history [26]; the later discussion on the history of business wargaming will underline this. Faria et al. [27] state that in the past 40 years, simulations have proliferated in many areas. Simulations have been used in strategic management courses [28], but also in operations management education [29]. While very few accounts on the explicit application of business wargaming in the classroom in the context of management education exists [e.g. 30], this article makes a contribution in this realm.

Lewis and Maylor [29, p. 136] summarises the definitions of simulation, arguing that besides difference, overlaps and confusions on terms such as *games, simulations, simulation games,* a few generic considerations can be made: "a simulation is a simplified, abstracted model with rules; a game is when people have the opportunity to 'play' within the environment of the simulation." Further, they argue that gaming is competitive and experimental: "The first is an opportunity to harness the dynamic of having other people trying to achieve the same thing. Such competition, we have observed to be almost always beneficial to the student experience, creating an additional pressure analogous to a competitive market. The second kind of play, is the experiment – giving the opportunity to see the effects of one or other strategy, but without having the benefit of a human competitor" [29, p. 136].

What are additional rationales for applying simulations in management education? Crookall and Thorngate [31] contend that the classroom symbolises knowledge while professions represent action. Closing this gap appears to be a prime rationale for applying simulations in the classroom.

Further, the notion of gaming in regard to simulations is relevant here. Simulations are primarily characterised by the notion of gaming. Gaming is credited with providing concrete experience [32,33] that is processed through reflection [31]. Bracken [34, p. 18] states, in the context of applying business wargaming: "The problem with many strategy techniques is that they are too cold and bloodless. They fail to capture human emotions, and because of their icy rational character, people

do not really pay attention to them. They are soon forgotten, and they make no lasting impact on the organisation. Gaming is profound learning experience, one that is not soon forgotten". Overall, the advantage of simulations and gaming is that it more deeply involves the participants through the emotional elements of simulation [31], thus producing a different and less traditional kind of learning experience.

In particular when these learning experience include actually creating scenarios, as it is the case with business wargaming due to its future-oriented nature, a link to the notion of the "Memory of the Future" [35] can be established. "We visit these futures and remember our visits. We have, in other words, a 'memory of the future', continually being formed and optimised in our imaginations and revisited time and time again" [36, p. 35].

4. Introducing business wargaming

Business wargaming has been credited as a valuable approach in fields of applications, including the military, including a historic perspective [37], management [38], in developing strategies [39–42], in competitive strategies [43], testing strategies [44–47], public policy [41], or for instance transportation planning [48]. In addition to the few comprehensive accounts of the military application to wargaming [e.g. 49–51], recent publications on the application in a business context [e.g. 41, 52, 53] point out to the rise in interest.

Kurtz [54] describes a business wargame as a role-playing simulation of a dynamic business situation. Each team in the wargame is cast in the role of certain stakeholder, such as a competitor, in some sort of business situation. The typical business wargame lasts several rounds, each one representing a defined time period. A business wargame is usually preceded by extensive research on the industry in which the wargame is supposed to take place.

"Wargame" is the literal translation of the German *Kriegsspiel*. Since many in the military are uncomfortable with the term *game* due to the gravity of war, wargames are often called "map manoeuvres," "field manoeuvres," "exercises," or, increasingly, "modelling and simulation." As in the business environment, there is some discomfort with both the terms "war" and "game." Hence, *wargames* have also been referred to as "strategic simulations." Wargames can have several purposes, such as strategy testing, crisis planning and management, change management, planning, and training and education [41].

4.1. History of business wargaming

Business wargaming can be traced at least as far back as ancient Greece. It grew out of military wargaming, which was used to prepare generals and officers for unforeseen circumstances on the battlefield. Games about warfare have probably existed as long as warfare itself [50]. Perla [50] credits the Chinese general and military philosopher Sun Tzu for developing the first wargame about 5000 years ago. This game was called "Wei-Hai," meaning "encirclement." "Go" appeared around 2200 BCE, "Chaturanga," around 500 CE, and, later, chess could be perceived as its successor. Even though chess is much more abstract than a wargame, chess and its forerunners contain several elements of warfare and can therefore be regarded as a wargame in a broader sense.

While wargaming evolved from these early games, the Prussian era was of considerable prominence in the history of military wargaming. From a military point of view, the 19th century was characterised by the expansion of armies – which were more difficult to move around – and industrialisation, which made the fighting of war more complex. Artillery could reach more distant targets and was capable of greater repetition and precision. By the end of the 19th century the automatic rifle had been introduced, increasing firepower to an unprecedented extent. In addition, the railroad made it possible to move troops faster. At this time, the term *wargame* came into existence, and wargaming became popular with the Prussian military.

Wargames were also used in the USA, Great Britain, Italy, France, Russia, and Japan, especially after the Prussian victory in the Franco-Prussian war of 1870–1871. Around this time, the wargaming tradition began in the USA, which is of particular importance since the United States continued to use wargaming after the Second World War, and is regarded as the pacesetter in the development of military wargaming during the 20th century.

The application of wargaming in the business context began in 1957 when the American Management Association (AMA) developed the first widely known business game, "The AMA Top Management Decision Simulation" [55]. The AMA game required teams of players, representing company officers to make business decisions. The game consisted of five teams of three or five persons each. The company produced a single product, which was sold on an open and competitive market. Usually five to ten years of company operations were simulated per game. In order to reduce the participants' computational burden, the AMA game allowed each company only a few decision alternatives. A mathematical model, aided by computers, was used to evaluate and calculate the teams' performance. In subsequent years, not only did many corporations and universities in the USA adopt the game, but new games were also developed. The purpose of these games was to teach business students how to run a company.

In 1958, an article on the application of wargaming to the business environment appeared in the *Harvard Business Review* [56]. The terms used in this article were "business gaming" and "management simulation." These games were used primarily for training and education, and built on the military use of wargaming. Even though business wargaming had been applied to company planning in the 1950s [57], it was not until the mid 1980s that wargaming was strategically adapted for business purposes [58,59].
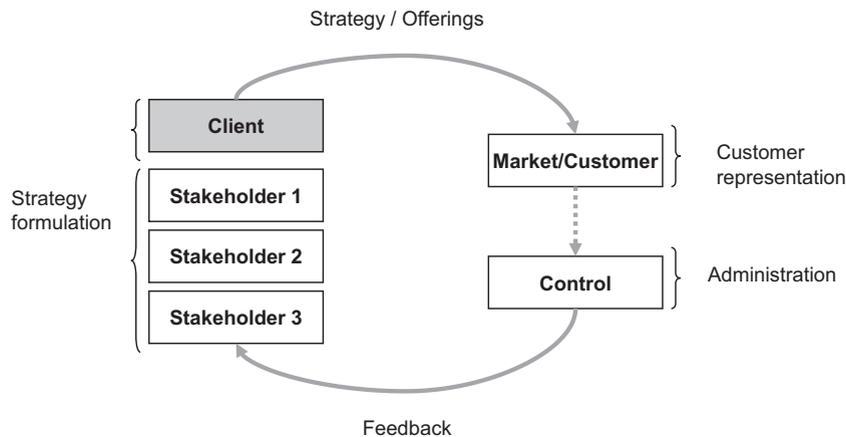
Strategy / Offerings

Fig. 1. Teams in a decision cycle ("move") of a business wargame.

4.2. How do business wargames work?

A typical business wargame [41] evolves over three moves, representing a certain length of time (e.g. three to ten years). A business wargame is predominately designed to evolve into the future, eventually describing scenarios of competitive business situations. The first move starts in the present, and is based on available data and information. A "move" is a decision cycle, which begins with the stakeholders or competing companies and the client team taking the initial actions, including competitive offerings, alliances, investments, or lobbying efforts. In general, as depicted in Fig. 1, four types of teams exist in a business wargame: a client team, competitive or stakeholder team, market team, and control team.

Competing teams will have to think about strategy, product, pricing, capacity, technology and the like, while considering the business environment. The members of the client team have to execute and adjust their own strategy. An essential part of each move is the reaction of the customers, usually played by a market team, consisting of a group of market experts. The market team will provide the reactions of customers, providing figures such as size of the market, market segments, market share, and revenue, and how these figures have changed in the course of the moves. All this data will be passed on to the control team, usually run by the wargaming experts, who use a financial model to calculate profits and losses. In addition, the control team is in charge of supervising the wargame and introducing discontinuities (e.g. technological developments or policy issues) to add real life dynamics, something that Fuld [60] emphasises. The control team can also assume the role of other stakeholders, such as regulators who are not represented in the business wargame as competitors.

At the end of each move the control team calculates the results of the competing teams and the client team, and uses these results as the starting point for the next move. While the market team reacts and the control team calculates the figures, the competitive teams and the client teams plan their next move. They then learn the results of the previous move. As pointed out earlier, concerning computer-based simulations, models are supportive, adding reality to the business wargame but not intended to drive the simulation.

Prior to carrying out a business wargame the objectives must be laid out, and that a database of all information that is potentially useful to the players is created. The model translates the game's data and the players' decisions into game events, quantifying the moves and results of the wargame [50]. After a business wargame has been played to completion, the wargaming experts and managers of the client company carry out an analysis, which is important for discussing lessons learned during the exercise. This analysis allows the managers to describe their experiences, to reflect on what they have learned, and to discuss subsequent steps, which will then result in additional lessons learned.

5. Reflecting on the application of business wargaming in the classroom

The aim of this section is to reflect on the application of business wargaming in the classroom. On the one hand, the author will reflect on experiences derived from six years of teaching strategy to diverse group of students, including MBAs, bachelor and management students, design und cultural studies students, as well as part-time MBAs across Europe by applying business wargaming. On the other hand this reflection will describe how a business wargame can be carried out in a classroom. Further, this reflection will incorporate several aspects of teaching and learning.

Generally speaking, the business wargames carried out in the classroom, followed the process described above. Students were assigned to all except the control team. While the competitor teams were concerned primarily with crafting strategies, the customer team not only set up a model to evaluate the competitor teams moves, but foremost represented the customers in the simulation. Usually before the business wargame started, the students were asked to conduct extensive research on the competitor that they had been assigned to play and on the industry in which the simulation was set.

5.1. Design: aided, not run by a computer

One essential feature of the approach to using business wargaming in the classroom shall now be elaborated. In order to judge and evaluate the moves of the competitor teams a computer model was not assigned, instead the business wargames relied on the human judgement of the customer team, making here a distinction between business wargaming and computer-based simulation. This essential distinction reflects how detailed the underlying model used in such a simulation is and how such a model determines the strategic options of the participants in the simulation [61].

In reference to business wargames, Chussil [42] argues that such a simulation is always underscored by "mental models", such as human judgement, or "quantitative models". The degree to which the model determines the simulation is relevant. The danger that a model poses in guiding a simulation is that they represent the perspective of the analysts who constructed that model [37]. The primary aim of not adding a computer-model in the classroom business wargame was not to simplify the alleged real world by implying that there can be right answers in crafting strategies in the business environment at hand, so to say, keeping the complexity of the business environment in regard to strategising in the business wargame.

In this area, Fuller and Loogma [62] note the advantages of role-playing over computer-based simulations. They argue that computer-based simulations appear not to be able to produce social knowledge per se, whereas in a role playing simulation new meanings appear to be generated from the known through social interaction. Even further, Cares and Miskel [63] argue that the most compelling results are derived from a simulation when a team has been shocked by a competitor's actions, as in a strategic crisis, and must then think more deeply about the dynamics of the competition. A business wargame must be dynamic, driven by its participants, and not based on computer simulations with a set number of parameters, interlinked with pre-set sensitivities [41].

5.2. Design: a knowledge perspective

Another aspect concerning the design of a business wargaming shall be elaborated on here: how to prepare students for a business wargame. Crookall and Thorngate [31, p. 19] propose three board types of simulations and thereby give an indication for the design of classroom business wargames:

- "Knowledge-to-action (K–A): Events that are designed, run, and debriefed primarily to enable or encourage participants to apply previous knowledge to some practical situation.
- Action-to-knowledge (A–K): Events that are designed, run, and debriefed primarily to enable or encourage participants to generate understanding, learn new skills, and gain new knowledge from a concrete experience.
- Integrating-action–knowledge (I-A–K): Events that are designed, run, and debriefed primarily to enable or encourage participants to make connections between their actions and the related knowledge."

These three categories can very well be perceived as a rough guideline on not only how to prepare students for a business wargame, but also what goals can be achieved in such a simulation. The knowledge-to-action approach has proven particularly viable with master students which for instance previously had a course on strategy, allowing them not only to apply but foremost to critically reflect their applied knowledge of strategy making. While this notion also applies for the integrating-action–knowledge, undergraduate students could benefit from acquiring a knowledge of strategy, without any background in the action-to-knowledge approach.

The action-to-knowledge approach was followed in four-day business wargames with bachelor and master design students, none of whom had previously taken strategy courses. The courses began with a very brief introduction to strategy, touching upon the aspects of the strategic position of an organisation. strategic choices, and strategy action [64], emphasising the role of customers, competitors, and trends. With this knowledge, the students started the business wargame. In the course of the business wargame, the students were given the opportunity to reflect and discuss their learning on strategy.

5.3. Role-playing

Baruch [65] argues that academic teaching is not just about passing on knowledge but also includes elements such as perpetration for working life, learning how to learn, and internalising the value of systems and culture, arguing that the effectiveness of teaching can be enhanced by applying theatrical role playing. Role playing certainly is a vital part of a business wargaming and one can argue that even theatrical elements are incorporated to some extent, e.g. when students are "acting" as CEO or as the representatives of a certain customer group. The theatrical momentum might not be as elaborated as suggested by Baruch [65], these ideas could certainly be further explored in the realm of business wargaming.

While in a corporate context, a business wargame allows its participants to step out of their "roles" in their organisation. and into the "role" of a competitor or other relevant stakeholder and simulate several years into the future over the course of a few days; this also applies for management students. In a business wargame, students slip into the role of executives who are responsible for developing strategies.

5.4. Action learning

It has been frequently postulated that learning benefits from action [e.g. 32, 65]. Most of the action lies at the core of a business wargaming simulation. In particular since business wargaming can be perceived as dynamic role playing simulation, one can argue that different roles enable the treatment of different subjects or situations and this might be one of most effective ways not only to engage students but also to initiate and maintain learning [65].

Can a business wargame also be perceived as a form of action learning? Bourner et al. [66] point out that action learning is not a simulation or business game. However, the argument can be made that a business wargame is linked to the principles of action learning: "(a) there is a clear structure to action learning set meetings; and (b) the set meetings are only part of the process. The other part is the testing out of ideas in action, and that happens in the time between the set meetings. . . . A cycle of action and reflection is at the hart of action learning" [66, p. 4].

A business wargame is not only a very structured event, in order to keep dynamics at a high level, it is predominantly about testing ideas (strategies) and exploring how they work. While Bourner et al. [66] emphasise the role of individuals in action learning, this notion might pertain to the groups involved in a business wargame. Besides, as described in the following, a business wargame is a group learning exercise.

5.5. Group dynamics

This article has argued that the engagement of students into critical management studies is a challenge for management education. In addition, the argument was made that critical action learning [22] might engage students in exploring the emotional and political dynamics of an organisation.[23].

A business wargame carried out at an art school was characterised by emotional and political dynamics. While the members of one team from the beginning struggled heroically to work together, this experience appeared to be very valuable for the entire business wargame. This team represented a well established company and actually started from a very comfortable position in the simulation. However, constant fights among the team members actually hindered their ability to reach decisions. During the entire simulations this team lost market-shares to their competitors and moved their company towards bankruptcy. A key lesson for this team was how much success in such a context would rely on political and emotional factors, and how successful management teams function. In particular these lessons indicate the ways in which a business wargame can engage students in critical management thinking and gain a deeper understanding of politics and power in organisations.

5.6. Strategic and futures thinking

As strategic thinking is a central element of a business wargame, the relevance of strategic thinking in management education has been already emphasised in this article. While Casey and Goldman [24] state that strategic thinking benefits from work experience, it can be argued that in a simulation, students can be immediately engaged in and subsequently reflect on their strategic thinking.

Further, the experiences with business wargaming in the classroom underlined that both strategic thinking and dealing with the complexity of the business context are important. In the first move in a business wargame, students usually struggled to give equal amounts of attention to their business environment, and especially to customers and weak signals of change and at the same time to their competitors. However, after the first round of feedback, the teams usually not only understood the interrelationships in the business environment but were also able to handle this complexity. In addition, the future-orientation of the business wargame, in particular when simulating up to 10 years into the future, challenged the students to think about how trends might evolve into the future and what alternative scenarios of the future could be and how this would relate to their strategy.

5.7. Debriefing

The phase of debriefing in a business wargame can be perceived as highly relevant for knowledge acquisition [31] and this is especially true in classroom business wargames. In a business wargame carried out with an organisation. this is the phase in which the members of an organisation.reflect on their learning and come up with implications for their individual businesses. In a classroom, this phase is essential for reflecting on what has been learned about strategy. Students have been shown to benefit from visits from experts from the industry in which the simulation has been set at this point. Not only does this allow the students to discuss their strategies with the experts, but they can also gain a sense of how much of the issues, at hand in an industry they covered in the business wargame.

It is interesting to note that the experts usually stated that the students did not necessarily come up with groundbreaking new ideas, but that they usually discussed the issues that were driving that industry. However, in some cases the students demonstrated a considerable amount of foresight.

5.8. Facilitation

The facilitator has several roles in a business wargame. Kriz [67] has identified three roles:

- Shaper: provides direction through introduction or arranges the setting.
- Obstetrician: supports participants, clarifies questions.
- Coach: observer and supporter.

These roles also apply to the facilitator in a classroom business wargame. Further, the facilitator is responsible for clarifying the rules but also dealing with the players' frustration [67]. A teacher in a classroom business wargame might also be called upon to give guidance on strategy, with an introduction to strategy at the beginning of the simulation or pointing out to certain concepts during the simulation to stimulate thinking about strategy.

6. Conclusion

Meeting contemporary challenges in management education is a difficult task. The purpose of this article was to describe how business wargaming could be used to meet these challenges. The main advantages of a business wargame are that it gives some structure, while leaving room for dynamics, creativity, and discussions among the participants. Above all, it actively engages the participants in a future-oriented learning experience. "Simulation brings learning from the third person to the first person" [68, p. 110].

While Reynolds and Vice [22] argue in favour of a combination of critical perspectives to management theory and action based learning, one can argue that to some extent this could be achieved in business wargaming. However, as described in this article an emphasis on critical management studies points to further potential in applying business wargaming, focusing more on the effects of emotions, politics, and power relations. This could imply the need to focus in the debriefing discussion, less on strategy and more on group dynamics. For instance, giving student-observers in each group the task of observing the group dynamics and to reflect on these observations in the debriefing discussion.

While not elaborated upon in this article, it can be argued that business wargaming can also be a means for problem based learning [25], which can be perceives as being based on a constructivist view of learning [67]. As described earlier, confronting students who have little knowledge on strategy with the 'problem' of actually strategising in a business wargaming appeared to be a very promising approach to introducing students to strategy and especially to strategic thinking.

This article has discussed the details of applying business wargaming in the classroom. However, the value of this discussion also lies in understanding what actually happens in a business wargaming, e.g. what kind of knowledge is acquired by participants or what is learned in such simulation. This discussion also points out to further research which could focus on creating a better understanding on the facilitation of business wargames. It has been argued in this article that a business wargame incorporates several elements of action learning [66,69]. Further drawing on this approach could enrich business wargaming.

Certainly, one limitation when doing research on simulations in the classroom, or anywhere else, is assessing the effectiveness of this approach in relation to other pedagogical approaches [25]. However, the observations from classroom business wargames as described here have clarified the value of this simulation for engaging students in learning about strategy making and thinking about the future in dynamic and complex environments.

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