Gamer mode
Identifying and managing unwanted behaviour in military educational wargaming

ANDERS FRANK
To Jasper and Maya
Abstract

Games are rule-governed systems at the same time as they are fiction, simulating or representing a real or an abstract world. This defining characteristic may create for different forms of tensions, that is, at different times players may focus on the rules, the fiction or on both during game play. In military education with games, this poses a problem when the learner becomes too focused on the rules, trying to win at any price rather than taking the representation and what it implies in terms of permissible behaviour seriously. In here we attempt to understand how participants in a wargaming situation act out this tension by studying the interaction between the player and the game in military tactical training.

The results first of all confirm that there is a tension – there are occasions where players are mainly concerned with winning the wargame, disregarding what the theme is meant to represent. I propose the term gamer mode to refer to this player orientation: players in gamer mode have an extreme rule-focused interaction, meaning they behave rationally with respect to game rules but irrationally with respect to the portrayed real-life situation they are training for.

Gamer mode can probably occur for many reasons. This thesis documents two contributing factors. The first concerns whenever the game does not match players’ expectation on mimicking warfare. In these situations players may find that the game breaks the fragile contract of upholding an accurate representation of warfare. The other factor that may lead to gamer mode are game design features such as explicit reward structures or victory conditions.

To remedy the situation, the instructor can, in real-time, actively support players’ orientation towards the game and explain in-game events, keeping them on track. When gamer mode occur I argue that the conditions for learning are compromised as the gaming activity becomes its own learning subject, blurring and overshadowing the learning objective. Although the results suggest that gamer mode is mainly detrimental to learning I conclude that gamer mode is a natural way students will approach games and as such, needs to be dealt with by the instructor.

Keywords
Gamer mode, military education, wargaming, game-based learning.
Sammanfattning

Spel är regelstyrda system samtidigt som de är fiktion. Denna egenskap kan skapa olika motsättningar där en spelare kan fokusera antingen på reglerna, fiktionen eller båda under sitt spelande. När vi använder spel i den militära utbildningen kan denna spänning skapa problem då eleven blir alltför fokuserad på spelreglerna och försöker vinna över motståndaren till varje pris och glömmer att ta betydelsen av representationen, lärandemålen och det förväntade beteendet på allvar.

I det här forskningsarbetet försöker vi förstå hur deltagarna i en professionell krigsspelsaktivitet hanterar dessa motsättningar. Resultaten visar, för det första, att det faktiskt finns en motsättning mellan en regelorienterad och en temaorienterad interaktion. Det finns tillfällen då spelare främst är intresserad av att vinna spelet samtidigt som de bortser från vad temat är tänkt att representera. I denna avhandling introducerar vi begreppet gamer mode för att referera till dessa situationer; spelarna i gamer mode har en extremt regelfokuserad interaktion, det vill säga de beter sig rationellt enligt spelreglerna men irrationalt i förhållande till den porträtterade verkliga situationen och därmed lärandemålen.

Att gamer mode förekommer kan bero på en mängd saker och denna avhandling dokumenterar två bidragande orsaker. Den första gäller situationer då spelet inte matchar spelarnas förväntningar på hur realistisk krigföring ser ut. I dessa situationer uppfattar spelarna att spelet inte har förmåga att upprätthålla en korrekt representation av krigföring, att spelets legitimitet går förlorad. Den andra orsaken som kan leda till gamer mode är att spelet innehåller explicita belöningsstrukturer eller segervillkor.

För att förhindra att gamer mode uppträder kan instruktören ta en aktiv roll i spelprocessen och vägleda spelarna, förklara händelser i spelet och vad dessa betyder. Jag hävdar att när gamer mode uppträder blir lärande-förutsättningarna felaktiga då själva spelaktiviteten blir ett lärandemål i sig själv. Det enda eleverna har möjlighet att lära sig är spelets regelstruktur vilket överskuggar det egentliga lärandemålet.

Även om studiernas resultat pekar på att gamer mode är skadligt för lärandet så är det ett naturligt sätt att förhålla sig till spelande och därför blir det viktigt för instruktörer att vara medvetna om det och kunna hantera det som en del av lärandeprocessen.
Nyckelord
Gamer mode, krigspel, militär utbildning, spelbaserat lärande.
Acknowledgement

One thing is for sure; undertaking theendeavour to finish a thesis takes a whole lot more effort than what you believe in the beginning. I have played computer games since my father brought home that cool Commodore 64 for Christmas 1983 and I have worked with games since the mid 90’s. But delve into games critically and do game research are a whole different affair. Above all it is hard bloody work. Finishing this thesis would not have been possible without so many kind, inspiring and supportive individuals around me that deserves some recognition.

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I beg to differ.

Stockholm, November 2014
Anders Frank
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1 INTRODUCTION

The alarm roared of an incoming missile. Everybody in the room stopped and looked at the radar screen showing a triangle quickly moving closer and closer to their ship. No one said anything as if paralyzed by the horrific seriousness of the situation. The small symbol crawled closer. It was obvious that the missile had locked its sensors on its target, like a determined eagle in a steep dive to catch a defenseless fish, unaware of the focused predator from the sky. Suddenly the missile disappeared from the screen. The silence was only broken by spontaneous wild speculations from the staff. “Did our close-in weapon system manage to eliminate the missile?”, “Are we hit?” No one could really tell until a determined and unforgiving text appeared next to the symbol of the ship. The text in red color said “Sinking.” No. We have been hit. Next to the depressing text a counter started to count down to zero, marking how long the staff would be able to follow their ship on their radar screen. When the counter reached zero the ship, or what was left of it, would leave the surface and start its journey to the bottom of the sea, transporting all poor sailors still alive after the fierce missile explosion to a grievous death trapped in inside the hull of the corvette. Then suddenly the commander of the staff yelled, “Turn on all active radars on that ship! Fire all missiles you can on the targets to the west. Come on! Do it!!” One of the staff members looked at the commander with surprise and suspicion. “What in heaven’s name does he mean?” The staff member knew that turning on all active radars on the sinking ship would provide a good overview of surrounding enemy vessels. And making a last move by firing all the missiles from the dying ship seemed like a desperate, yet heroic, last contribution to the fleet. “But is that realistic?” he thought to himself.

I observed the staff in action with skepticism. I have seen videos of real sea missiles hitting a ship of this size, and the last thing one can expect from such an incident is that the radars and weapon systems onboard would be operative. However, this was not for real. The room was not the command center of the fleet; it was an ordinary office filled with computers and big monitors. The staff members were not fleet commanders but officer students playing as the blue side of a game.
between two make-believe fleets to enhance their skills in naval warfare. My skepticism came from realising that the staff commander played the wargame differently from what I expected. To this player the wargame was not a simulation of naval battle; it was only a duel where he and his staff were competing against another team. To him the features of the game, the rules that defined what could be done with the naval vessels, could be creatively exploited to overcome his opponent. To him it was a game system and not a stage for a realistic enacting of a real battle between two fleets.

It is a fundamental fact of games that, as cultural forms, they are rule-governed systems at the same time as they are fiction, simulating or representing a real or abstract world. This is perhaps the most defining and unique characteristic of games. At the same time, this duality may create different forms of tensions, i.e., at different times the rules and representation can become the main focal point for players. If the focus is on the rules, it is possible to disregard the theme or narrative in the game, just as the staff commander did when he issued an unrealistic order that was allowed by the game rules.

This thesis is an investigation into how players act out these tensions. More specifically, it is a thesis about this tension in the specific practice of using games for educational purposes in the military sector. Here the idea is that the players, who are also the learners, need to relate to the theme and the representations of the game, translating it to their reality and what they may face in the real world once their education is completed. However, as we shall see in the studies I have performed, these games, as all games, are rule-governed systems, and sometimes the learner becomes too focused on those rules, trying to beat the system at any price, winning the game rather than taking the representation and what it implies as permissible behaviour seriously – representations that are supposed to portray real-life military practices. What does this dual nature of games mean for the field of wargaming and military simulations? How do officers handle this dual nature when training for their craft? If a practice as warfare is treated as a ‘sport’ during education, one can argue that games might not be so appropriate for military training. Or, does the de-contextualisation of the simulated phenomena hold an unused educational potential? Can flawed educational game design be good for learning? These questions are the point of departure for this thesis.
Before we go deeper into these questions, my method and contributions, let me delimit the scope of this thesis. I will for instance not deal with gamification, nor will I make claims pertaining to all forms of military gaming practices.

1.1 GAME-BASED LEARNING VS. GAMIFICATION

First, my work is not in the realms of the increasingly popular design element named gamification. Even though the idea of using games for educational purposes has its roots in the military sector (Smith, 2010; Perla, 1990), it has now become a field that is much broader, covering many different domains and embracing a multitude of different approaches. A central distinction can be made between game-based learning and gamification (Linderoth, 2012). Whereas game-based learning refers to the use of games in educational practices, gamification is a broader concept. Gamification means using game mechanics and game characteristics in contexts that are not in themselves games (Deterding, Dixon, Khaled, & Nacke, 2011). For instance a gamified marketing campaign is one in which you, by sharing advertisements in social media, gain a chance of winning some product in a lottery. Moreover, in a gamified health initiative you will earn trophies and rewards as encouragement when you perform physical exercise and consume healthy food. An overall problem with gamification lies in its fundamental assumption, namely, to turn a problem into a game, as the risks are that the behaviour encouraged by the game will vanish the same second you stop playing the game.

In the educational field a vast number of attempts have been made to try and implement game and game-like features into schools. One of the forerunners here is James Paul Gee, who in his book *What Video Games Can Teach Us about Learning and Literacy* (Gee, 2003) argues that games are excellent learning machines. Even though he does not specifically use the gamification concept, Gee advocates that video games embody good principles of learning. One of his later books even has the title *Good Video Games Plus Good Learning* (Gee, 2007). The idea is that by identifying the underlying structures of good games, educational practices can be informed on how to design instruction.

Gee’s approach has been criticised for not taking specific design features of different games into account when claiming that progressing through a game will be equal to reaching the learning goals. Linderoth
(2012) challenges Gee by calling it the “illusion of learning” by pointing out that progression in a game just as well can be built into the design of the game, i.e., some games have today almost reversed learning curves, being harder at the beginning before the player has started to level or equipping the player’s avatar with better gear.

In this thesis, however, I leave the matter of gamification here. It should be stressed that my studies are done in the field of game-based learning and should not be confused with the arguments tied to the concept of gamification and the works of Gee.

1.2 DIGITAL AND NON-DIGITAL GAMES

Before narrowing the field down to military practices and stating the aim of my study, I want to discuss the scope of the results presented in the thesis. Even though all my studies are done on applications with digital technology, I do not consider digital games to be entirely different from their non-digital forms. Digital games and analogue games are first and foremost games, but played with different techniques. This means that I find research on non-digital games to be an informative background to my studies. I also claim that my results are not only useful to the design and use of digital games but can be informative to all sorts of military game settings.

However, there is another delimitation I need to make of what my thesis covers. Linderoth (2012) takes what he names an ecological perspective in his studies of gameplay. Following Gibson (1979/1986), Linderoth argues that human activity in general can be described, at the most basic level, as a perception-action cycle. What is fundamental to our encounter with the world is that we are able to both perceive and act on possibilities provided by the environment. Linderoth argues that games will either mainly challenge the perception – or the action part of this tight, interactive perception-action cycle. Whereas some games are challenging in terms of perceiving and choosing what actions to take, others are challenging in the sense that it is hard to perform the specific actions they demand. For example, board games like *Risk*¹ or digital

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¹ *Risk* is a strategy board game where the objective is to occupy territories by eliminating other player armies. The results of the battles are determined by dice rolls.
strategy games like *Civilization*\(^2\) are all about seeing possibilities and choosing actions. These games are not designed to be challenging in the sense that moving pieces or clicking on the screen is part of the challenge. They may be compared to games like table tennis, soccer, or first-person shooters, where the challenge is not so much in perceiving what to do, which is for the most part rather straightforward; instead the challenge is in having the ability and skills in how to act.

In the world of military training this is analogous to the distinction sometimes made between *constructive* and *virtual* simulations (Smith, 1998). Constructive simulations include strategic wargames aimed at training in strategic decision-making, challenging the perception part of the cycle. Virtual simulators, on the other hand, are training environments for learning to perform specific skills, such as any form of vehicle manoeuvring, shooting simulators, or operating various forms of machinery. These virtual simulators challenge the action part of the cycle. It should be stressed, though, that any challenge to the action system also demands perceptual skills. For instance, a good soccer player not only needs to have control over the ball but also needs to be a good game reader, informing the decision on how to act.

In this thesis, I study digital games that emphasise training the perceptual, decision-making part of the cycle. This does not mean that I avoid non-digital games, such as board games, even if these games often include a tighter coupling of perception and action/strategic skills.

### 1.3 Games and Simulations for Military Training

The military has used wargaming as a tool for warfare since the Roman empire (Smith, 2010). Some even argue that wargames have existed as long as war itself (Perla, 1990). The assumption has been that wargames provide an opportunity for militaries to make decisions and to learn about the effects of those decisions (Perla, 1990). Wargaming is seen as an important part of military training to prepare, in particular, military decision-makers (officers) to deal with complex and uncertain situations (Perla & McGrady, 2011).

However, these games are rule-governed systems that are supposed to model and represent something beyond the games themselves. The

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\(^2\) *Civilization* is a computer game in which players guide the development of civilisations, starting at prehistory, by building cities, researching technologies, and negotiating with other players.
The literature on wargaming suggests that the gaming risks becoming its own content – entirely separate from what happens in a real war situation. The risk is that the skills developed through the playing of wargames will be closely tied to the game activity content without the necessary connection to the military profession outside the gaming environment. Rubel (2006) argues that a player artefact crops up in wargaming where players tend to be more aggressive than they would be in the real world. One reason for this overly aggressive behaviour is that there is no “tomorrow” to be provided for by the players after the game has ended. They are willing to sacrifice a lot to win, as they will not need the troops tomorrow or will not have to deal with the reality of their sacrifices to win. Military theorist Lind (1985) claims that games, especially computer games that declare a winner, will entice players into a specific playing style mainly oriented towards achieving the game goals. Perla (1990) points to problems of translating details of reality into game mechanics, making players “game the game” rather than react to activities that would be more likely to occur in real war situations. When the game’s representation of reality is too far from the reality (in some form), players might lose their professional approach to the game and drop out of their military roles.

These publications indicate that there are issues to utilising gaming in military education that can be explained by the tension between game rules and the representation in the game. It is a problem that is suggested, but it has not been properly empirically documented, nor has any answer as to how we can address it been established. The arguments presented are oftentimes based on the author’s own experiences or observations, not on rigorous studies. In this thesis, I will take on this challenge, trying to both empirically document when and why “gaming the game” happens, as well as suggesting what can be done about it. I will approach wargaming as it is practiced among cadets at the Swedish National Defence College, through studying in detail the relation and interaction that takes place between the game, the player, and the instructor.

Gaming for military decision-making, crisis command and control situations have been investigated by others. Brynielsson (2006) propose a gaming perspective to produce decision-making support to be used in command and control centres. He relies on game theory and artificial intelligence to overcome the gap between theoretical foundations and the
applied use of command and control but does not study how decision-making is practiced in education. Jiri Trnka (2009) has investigated and proposed a role-playing simulation approach to study command and control work in emergency and crisis response operations. Although crisis response at tactical level resembles the situation for a military commander that I have studied, the context differs and crisis response does not entail live adversaries.

Although game studies of game-based learning constitute an established field, there is a shortage of empirical studies on the gaming activity itself (Linderoth, 2004; Arnseth, 2006). Studies have for the main part circled around the design of games and the extent to which the game in itself provides a better alternative to other teaching media (O’Neil, Wainess, & Baker, 2005; Hayes, 2005). It is as if the gaming activity is assumed and already determined after an analysis of the game structure. Bennerstedt (2013) explored in depth what knowledge is embedded in digital game practices and found that players typically become highly specialized, solving the specific tasks in the game context. Oftentimes arguments make clear that game playing nurture skills, such as leadership, that is useful outside the gaming world (Jang & Ryu, 2011). However, Bennerstedt found that concepts such as “collaboration” has a very specific meaning and is practiced in a very distinctive way in the gaming domain, which means we need to further our understanding on players’ actual game play before making claims on the skills usefulness outside the game world.

In here, we will get close to cadets actually playing the games, analysing their every move, step by step, to better understand this practice. In addition, focusing too single-handedly on a single element ignores the fact that the educational game is just one element among others in a didactic setting. That setting also includes objectives, facilitators, players with previous experiences, fellow learners, and an established instruction on how to play the game and afterwards reflect on the game experience. Therefore, it is a complicated issue to make claims on learning by focusing solely on a single element of this setting, such as the gaming activity, the learning context, or the game design.

Another approach, the one I have taken in this thesis, is to study wargaming as it unfolds in everyday military practice (Lave & Wenger, 1991). I have therefore studied wargaming as it is practiced in officer training in a military tactics course. Through this choice, I avoid taking
people out of their ordinary environment, thereby providing for a better ecological validity. I also avoid making claims that are based on controlled lab-studies that risk depriving the study object from the overall learning objective. Instead I aimed to account for all the different elements of a learning situation, moving my focus of study to where the wargame is actually used.

In summary, if I were to simplify the problem I have studied, it would be as a tension between two sides of the gaming activity. On the one side, the players in educational wargaming are bound by the game rules, because these rules dictate the conditions how to play the game. At the same time players are supposed to take the fictional world seriously and act and behave as an officer would do in the real world. This situation can create a form of tension, meaning that one of these two focuses can be more active than the other in shaping the players’ interaction with the wargame.

1.4 Research Objective

The two sides of the gaming activity raise a number of questions of practical nature that this thesis will elaborate on and answer. My work started with an aim to understand how participants in a wargaming situation act out the tension between the represented situation and the game. This inquiry led me to focus on a specific situation which I named ‘gamer mode’, in which participants lets their urge to win take precedence over the learning goals. I started to explore what triggered gamer mode as well as what could be done to manage it. With this extended view of how participants end up in and act out gamer mode I ended up asking the following questions:

- Are some interactions more fruitful to learning? Or detrimental to the learning process? In particular, does gamer mode lead to impoverished learning?
- What triggers different players to change focus and orientation towards the game i.e. entering gamer mode?
- Is it possible to influence or control learners’ stance towards this tension by designing the game differently?
- Is it possible to influence or control learners’ stance towards this tension by changing the instructions given by the teacher?
1.5 Contributions

Based on the studies in this thesis I have made following contribution to the research on game based learning:

- I have empirically documented and described a player orientation, which I name *gamer mode*, where players focus more on winning the game rather than on acting “in role” vis-à-vis their learning goals. When players engage in this orientation toward the game, what the game is meant to represent is suppressed and what is represented stops shaping the players’ interaction with the game. In my data, gamer mode is revealed through how the players make use of the rules, even exploiting them, to reach the game goals, winning over their opponent even when this goes against what should take place in a realistic scenario. Although the military encourages efforts to win, people in gamer mode have a higher risk tendency and conduct the military operation differently from what is intended or desirable in realistic settings.

- I have also found two situations where gamer mode is more likely to occur:
  - The first is when the game representation does not match the players’ expectations on realistic warfare, that is, when the response from the game goes beyond what the player can predict as a plausible outcome. In these situations players perceive that the game breaks the contract, failing to uphold a legitimate representation of warfare, thus steering players into abandoning a professional orientation toward the game in favour of overcoming the opponent by other means. However, these occasions may be turned around to become beneficial to learning as the players critically challenge both their beliefs and underlying assumptions of how warfare is represented in the game. Thus, even flaws in the game system can be beneficial for learning – if the teacher and players take the opportunity to reflect on what happened.
The second situation is when features of the game, such as the reward system, come to the forefront, shaping players’ strategies in unwanted directions. Educational games with an explicit reward structure, such as victory points, make players adjust their strategies into a more aggressive behaviour. They become more interested in fulfilling the game goals rather than behaving in accordance with the theme of the game.

Finally, from my studies I noted there are some strategies that an instructor can engage in to counteract the negative effects of gamer mode or even avoid them. Apart from discussing gamer mode with the players before and after they engage in the game, making them reflect on their learning goals, there are also a couple of other strategies during game play. First, if instructors can follow player actions as the game unfolds in real time, and intervene, they can prevent this player orientation. However, this requires the instructor to have sufficient knowledge of warfare and the attributes of the models used in the game, and to understand wargaming as a learning method. Otherwise, detecting less desirable player behaviour will be difficult. Second, the instructor can support the players’ gaming by taking an active part in the narrative that develops. This includes role-playing specific functions, such as higher command, but also reminding players what the events that unfold mean in the real world outside the game.

1.6 STRUCTURE OF THE THESIS

This compilation thesis is structured into six chapters and four appendices containing published papers describing my empirical studies. The first chapter, which you have just read, sketches the problem I have approached and places the use of games and simulations for military training in the broader field of game-based learning. Chapter 2 summarises previous studies on game-based learning in general and military game–based learning in particular. Here I mainly focus on studies and literature relevant to the duality of games – being both representations and rule-governed systems. The part about military
game–based learning also serves as an introduction to military wargaming. The chapter ends with an introduction to learning theories and explicates my stance on learning in wargaming. Based on this understanding, in Chapter 3 my methodological point of departure is explained. In this chapter I also discuss the design and methodology of the studies, focusing on the video data of occurring interaction as the analysis object. Chapter 4 summarises the studies (which are all accounted for in their full length in the attached papers). Chapter 5 provides a discussion of game design and learning, which is based on the findings all taken together. Chapter 6 summarises the thesis and then discusses three implications of my studies. First, I relate my findings to the research field of game-based learning. Then I point out some implications of my results for the practice of military educational wargaming. Finally I discuss the limitations and shortcomings of my own work with some suggestions for future work.

1.7 SUMMARY OF PAPERS

The work in this thesis is based upon a number of publications appearing as papers in conference proceedings and a journal publication. These are all summarised in chapter 4 and attached in full length after the cover paper.


II. Frank, A. (2011). Unexpected Game Calculations in Educational Wargaming: Design Flaw or Beneficial to Learning? In Proceedings of Digra 2011 Conference: Think Design Play. Hilversum, Netherlands, September: 14–17. In this paper I describe situations when learning games are not perceived as realistic to the player, which is visible when the wargame calculates battle outcome. Defined as unexpected game
calculations, these incidents can trigger players to fall into gamer mode, in which players reject the idea that the game accurately portrays warfare. In a study of cadets playing a commercial strategic wargame as part of their course in war science, unexpected game calculations resulted in different user responses. Although the user responses risked damaging the learning worth from the gaming, I argue that learning could benefit from these incidents, as the cadets became interested and keen to find rationales to why and how unexpected calculations occur.

III. Frank, A. (2014). Achieving Game Goals at All Costs? In: S.A. Meijer, R. Smeds (Eds.), *Frontiers in Gaming Simulation*, Springer Lecture Notes in Computer Science, Vol. 8264, (pp. 13-20). ISBN 978-3-319-04953-3. This paper summarises a study where I analysed the consequences of playing a wargame with victory points. Playing with victory points generated a lower unit health value compared with wargame matches where no victory points were used. I interpret the results as that the players tried to earn those victory points by employing a strategy not in line with tactical regulations.

IV. Frank, A. (2014). The Instructor Role during Educational Wargaming. In: W.C. Kriz (ed.), *The Shift from Teaching to Learning: Individual, Collective and Organizational Learning through Gaming Simulation*, (pp. 10-20). ISBN: 978-3-7639-5420-9. This paper elaborates on the instructor’s role during game-based learning to prevent gamer mode to occur and instead support the desired player-orientation toward the game. The instructor has a vital role in leading the debriefing discussion in game-based learning. The role during the gaming part, however, is not as clear. Some results suggest that the instructor should take an active and authoritative role, but results provide few clues on how to apply this to military wargaming. By reasoning on the main characteristic features of wargaming, to play the game and to learn from the experience, I conclude that the main duties of the instructor are to *frame the game activity* and to *steer the learning process*. This supports earlier results that the instructor
should take an active part in the gaming process, but needs to have the skills, knowledge, and authority to intervene in students’ game play.

The results are based on my analysis of empirical data collected from an officers’ course in military tactics at Swedish National Defence College. The hardware and software setup for the educational game environment, including the recording equipment, was administered by Hans Sandström. Capt. (res) Johan Elg and several other teachers from National Defence College facilitated the wargaming sessions in the course. Analysis of video segments was partly done with help from Dr. Jarmo Laaksolahti, Capt. Jarmo Perkola, and my supervisor, Professor Kristina Höök. However, the research, analysis, and paper writing were all done by myself.
2 BACKGROUND

Let us begin by providing an account of the relation between rules and fiction as portrayed by game theorists and researchers. We then proceed to provide an account of military wargaming, discussing how the duality of games poses problems to learning in the military domain.

As learning is a complex topic, there are many different theories that treat learning process. I will briefly introduce those different theories, introducing the specific perspective that I have employed in the work presented in this thesis: a perspective where the situation in itself is in focus for studying how learning unfolds.

2.1 ARGUMENTS ON THE RELATION BETWEEN RULES AND FICTION

The French philosopher Roger Caillois introduces a taxonomy on play forms in his seminal book on play and games (Caillios, 1961). He outlines four broad categories of games, based on the basic principle that governs the activity. In agôn we find games of will and competition, such as chess, boxing, or football. In the category of alea there are games that include some sort of chance or luck, for instance represented by the roll of a dice. Typically the outcome of these games cannot be determined by the skills of the player but is more a result of randomness, as in lottery and other gambling activities. The third category is named mimicry, because these play forms include simulation and role-playing, i.e., players assume roles and play as if they were someone else. Finally, in ilinx we find games with elements of vertigo, arousal, dizziness, or other perception distortions.

Caillois’ taxonomy provides terms for separating different classes of games. Those that are rule-based and where players employ a specific skill-set to achieve the goals (agôn) can be compared to games where the players are mainly taking on a role (mimicry). Caillois is clear, however, on what separates these two categories. Both categories are free activities outside “ordinary” life (Huizinga, 1970), but they differ in what governs these extraordinary activities. Caillois states that agôn games are separated from life by replacing the “confused and intricate laws of ordinary life” in a fixed time and space with “precise, arbitrary, unexceptionable rules” (Caillois, 1961). The complexity of life is replaced by precise rules in the game that need to be followed here and now. Caillois argues that these rules must be accepted as such, as they govern
the correct way to play the game. On the other hand, in make-believe games of mimicry, the rules are replaced with something else. In mimicry the sentiment in as if replaces the fixed and rigid rules by creating a framework of assumed behaviour (Caillois, 1961). As such mimicry differs from agôn in that players in mimicry can act more freely as long as they still assume their role in the game. Caillois means that this free improvisation of playing a role creates a pleasure of its own, compared with agôn games where the pleasure for the main part comes from winning or achieving objectives.

Juul (2005) criticises Caillois assertions by stating that many board and video games include both elements of agôn and mimicry – that is, both ruled-based and make-believe. For obvious reasons Caillois did not analyse modern digital games when writing his book, but Juul’s criticism is more eloquent than just stating that Caillois’ taxonomy is out of date. Juul goes into detail on the complex relationship between the fictional aspect of games and the rules. He argues that games are half-real, meaning that video games are made up of two different sides at the same time. On the one hand, games are made out of real rules the players can interact with, and on the other hand, the games contain a fictional world with made-up elements that players are supposed to imagine. Juul argues that the fictional world in games matters. From the fictional world the player is given the opportunity to understand the rules, meaning that the theme in the game conveys what possibilities and constraints are presupposed in the game. Through the fiction the player both understands what challenges will be expected and is also provided on how to solve such challenges. However, the fictional world is played within the boundaries of the rules, and this isolation from the real world opens up the emergence of possible contradictions to occur. Juul argues that this can only be explained in the context of the rules (Juul, 2005). It is hard to explain the logic of reviving military units after they have been eliminated by referring to rules in the fictional world. Or why certain cities or regions on a game map will yield more victory points to an army. However, if we include the game rules these events and features become explainable and coherent. Juul argues that although the fictional world may be incoherent and fragmented, the rules are always ontologically stable. Games are a special kind of cultural form, projecting a fictional world “in which players can meaningfully engage with the game even while refusing to imagine the world that the game projects” (Juul, 2005). This means that
games have the ability to create an internally valid meaning regardless of the theme or fiction where the playing is set.

Juul’s critique of Caillois’ terms *agon* and *mimicry* is based on these authors having different approaches to games. Whereas Caillois categorises games based on the play forms and refers to the basic attitude governing play, Juul seeks essential properties of games. With slightly different approaches both their arguments on the differences between rules and make-believe/fiction can contribute to our understanding of games in their own way. This becomes especially important in order to highlight the intricacies of what governs players’ sense of internally consistent meaning inside the game. This relationship is further examined in detailed, empirical studies of actual gameplay.

Linderoth (2004) investigated the meaning-making processes that children engage in when playing entertainment games. By video recordings of the children playing different entertainment games he saw that the children produce meaning by shifting between different established frameworks to deal with what they experience. Linderoth identified and categorised their behaviour into separate interaction patterns needed to establish and uphold those frameworks. The meaning produced amongst the children had only a minimal point of departure from the theme of the game. Instead he found that meaning was generated from a so-called *rule-focused framework*, in which children did not treat the game as a representation of something other than what it immediately afforded. For instance, the children did not treat iron or grain in one strategy game as representation of different natural resources. Iron and grain were instead used as ‘something that can be turned into something else’, which in turn increased the players’ success in the game. Rules thus dominated over the theme of the game when shaping player interaction, which suggests that playing games is a meaningful activity in its own right and may not be consistent with the theme.

This can pose problems to learning with games, as the gameplay is normally set in a relevant theme to learn more on the subject matter. Linderoth found only weak support for the idea that embedding learning goals in the theme would automatically lead to learning. Instead, the results suggest that learning from playing games needs to originate from enacting the rules. Furthermore, although this study concerned children playing commercial games for pleasure, the results direct attention to
how rules can override other designed elements as the players struggle to reach the goals. A fundamental assumption in game-based learning is a theory that games have motivational characteristics (Malone, 1982; Garris, Ahlers, & Driskell, 2002). However, as motivation intensifies, as a consequence of a rule-focused interaction to reach the goals, the risk is that the student is diverted from the educational objectives. Rieber and Noah (2008) found evidence of how this intense motivation could pose a threat to the learning.

In a study among university students, Rieber and Noah (2008) compared the learning effects between two versions of a computer simulation. Both versions modelled a scientific principle. The aim was that students would explore and figure out the characteristics of those principles. One version was a pure simulation, and the other was embedded in a game context. The results show a mixed set of findings that could be interpreted as both supporting and not supporting the idea that games are good for learning. Rieber and Noah are cautious to not jump into conclusions that would side with either position. However, their qualitative study, which accompanied their quantitative study, revealed some interesting observations. The game-context simulation interfered with student learning in one aspect, as the authors noted that the students became “obsessed with improving their score [...] and that the game inhibited all reflection on the underlying science principles”. Rieber and Noah defined these students as going in a “Nintendo mode” and “twitch mode”. Moreover, they could observe how many students had difficulties in focusing their attention on the task when left on their own, which suggests that a tutor or facilitator should monitor learning with game-like simulations.

This means that the engagement from playing learning-games may ironically not only motivate players but may also divert them from their learning objectives. These impediments to learning have also been found in business simulation games. Harviainen, Lainema, and Saarinen (2012) collected interviews from students and business executives with experience in business simulation games. Their inquiry was to understand potential impediments to learning. One of the findings was that the competition element in gaming generated a set of problematic symptoms. When the competition ‘took over’, meaning that the activity became reduced to a contest, players defaulted to the game-based logic instead of using the business simulation games as a tool to experiment,
explore, and try out various strategies. Game-based logic dictated many winning strategies, but some would be absurd if used in real life, which some players seemed to disregard. For instance, some players could sell all the assets in the company in the last turn so as to be declared the winning company with the biggest profit in the end.

These behaviours exemplify the distinction between performance and learning in business simulation games. Players struggle against their opponent by running their companies in the best way possible, and good performance will lead to victory. However, the measure of performance, as which company is the most profitable in the end, is not a good indicator that players have learned from the game or that they have employed an excellent strategy. Who is declared a winner in the end is not as important compared with the insights and reflections on why and how decisions were made in the gaming environment. Thus, although players strive to improve financial performance in the game, it is not what the main learning objectives are about.

Gredler (1996) supports the position made by Caillois with respect to mimicry and agôn and the reasons for their impact on learning in simulation games. She issues a warning to mixing experiential simulations with games. According to Gredler, experiential simulations are activities where participants take on serious roles and exercise responsibilities to solve complex tasks or problems in a scenario. In games, the objective is to win, which turns the game into a competition. To mix experiential simulations with games in an exercise will, according to Gredler, create a mixed-metaphor problem, in which two conflicting messages will be sent to the learner. The learner is supposed to act the play, but the focus on who is declared the winner in the end may distort the simulation and role-playing experience and thus become detrimental to the learning process. The students will shape their strategies based on the behaviour that ultimately leads to winning (Gredler, 1996; Schild, 1966).

In summary, these findings suggest that the structure of the game, i.e., the rules, dictates the conditions and shapes the players’ interactions. Games are designed to create their own, internally consistent meaning, separate from “ordinary” life, and the fiction in the game risks being ignored by players as they do not treat the game as a representation of something other than what it immediately affords. This could generate problems when the learning purpose is to further players’ understanding
of the world the game projects. To only design the learning game around a specific theme is therefore not sufficient; the rules also need to adhere to what is being learned.

Let us now turn to military wargaming, which is practiced with a long tradition and an undisputed educational value to military organisations. Officers, as further elaborated below, are exposed to gaming throughout their entire careers as a means to practice their profession. And because life and limb is at stake in this profession, one might argue that the outcome of learning with games is of crucial value. My interest is thus to investigate whether the tension between rules and fiction can be found in military wargaming, and to study this with a view on officers’ learning practices. Before this inquiry is specified in detail let me briefly introduce military wargaming.

2.2 THE WARGAMING DOMAIN

Wargaming, the professional use of wargames, exposes officers to warfare situations – either in symbolic forms, representing real war situations from the past, or in abstract forms, in an attempt to train for specific dilemmas or problems. The educational use of wargaming has existed since the Roman empire (Smith, 2010). It provides participants with a fictitious arena where decisions can be made, relationships of warfare phenomena can be observed, and roles can be acted out. McHugh (1966/2011) defines a wargame as a “simulation of selected aspects of a conflict situation” and outlines two primary use purposes. First, wargames may be used for educational purposes by providing military commanders with decision-making experience, and second, they can be used for analytical purposes in which commanders are provided with decision-making information (McHugh, 1966/2011). From these two use purposes we can detect different foci. In educational games the decision making of commanders is central, and from the analytical games the primary interest are the events and outcome that follow. However, both purposes rely on the assumption that the value of wargaming will, in various ways, be applicable to the military profession.

It is no coincidence that the military has the longest tradition of using gaming for training purposes. Unlike other professionals, military officers have limited opportunity to practice their profession during peacetime (McHugh, 1966/2011; Weiner, 1959). Therefore, several methods, tools
and techniques have been developed in military education to support the practice. Usually, and before practice, theoretical phases complement officer education and training (Baudin, Elg, Högström, Kallak, Sulocki, & Thunholm, 2012). Theories of war will present facts to students and provide a critical approach to the nature of warfare, which is mainly done through seminars, lectures, and literature studies. Learning the practical elements in the profession is provided by other means, such as field exercises (commanding real units in realistic environments), command post exercises (learning to act and function in a staff), and classroom exercises and wargaming (conducting military operations with simulated units against a live opponent). The reason why and how the military has adopted games as a useful method to learn about, think about, and analyse warfare is best answered by providing a historical perspective. Although there have been educational uses for games for military purposes for centuries (Smith, 2010), it was not until the early nineteen century that the modern era of military wargaming began (Perla 1990; Weiner, 1959). In 1824 Von Reisswitz Jr. modified and developed his father’s warfare boardgame and demonstrated it to the chief of the Prussian general staff. The boardgame consisted of a map with equidistance lines representing elevation in the terrain. The game required at least three players, with one player acting as an umpire. The other two commanded troops on each side of the battle. The troops, made out of thin metallic strips, were only laid out on the map when the other side could see them, which made it possible to do concealed movements. Von Reisswitz also created rules in a handbook on how to resolve the combats. Uncertainties and an amount of luck were introduced in the game by dice rolls, which added dynamics to the combat outcome. One of the great characteristics of this game was ease-of-use for the players. Many of the tedious and complex tasks of keeping track of movements and determining the outcomes were made by the experienced umpire. The umpire also provided each commander with only that amount of information that would be given in a real war. With this, the commanders’ decisions had to be made based on incomplete information of the battlefield, which more or less mimics the situation of commanders on the real battlefield.
The demonstration was such a success that formal recommendation letters were sent to the whole Prussian Army. The staff thought this training method was too valuable to be used only for recreational purposes. What Von Reisswitz succeeded in was to design a game that made players make decisions similar to those made by officers on the battlefield. Earlier ‘Kriegspiel’ had difficulties in fusing “serious business of warfare and the more frivolous demands of a game”, which Von Reisswitz managed to overcome (Perla, 1990). He based the design on an understanding “as to what war was all about and what its main constituents were” (van Creveld, 2013). This meant that in the game no competing side had complete information about the other, and a common scale was used so that units moved in the game in the same pace as in the real world, which also took into account features of the terrain. Moreover, umpires relieved the players from having to understand all details of the game. Umpires could also adjudicate complex combats based on their experience, which increased realism to the battles.

Figure 1. Replica of the table-top Kriegspiel by Von Reisswitz Jr. translated into English. The size of the individual game pieces occupies the same space on the board as the military units would in the real world. This makes it easier to perceive distance, length and movement speed, which is aided by different rulers.
Wargaming nowadays comes in a multitude of forms: map games, digital games, discussion games, and board games. However, they typically share the same basic principles from von Reisswitz’s ‘Kriegespiel’. Perla (1990) provides an overview of some of these elements associated with wargaming. He argues that the main reason to spend time and energy on wargames is to exercise decision making. To do so, the game must be structured in ways to help players make informed decisions. Therefore, the first element, according to Perla, is the objective, the overall purpose of playing the game. This is the most important element that needs to be cleared out before designing, playing, and analysing a game – all the elements in a game must support this well-defined objective. The second to fifth element in Perla’s taxonomy concerns the game itself. Perla names them Scenario, Database, Models, and Rules. Scenario is the theme of the game – the environment in which the game takes place. Database typically consists of the available forces. The Models are the equations and look-up tables, i.e., when the players make a decision on elements in the Database the Model can translate them into game events. In Rules, Perla describes procedures of how and when to apply models. A typical example includes the “fog of war” that dictates how much information on the opponent and the environment is available to the player given the current situation. The sixth element concerns Players, which, Perla argues, are cast into operational roles. These roles will determine responsibility and will dictate what information will be given during game play. The seventh element, Analysis, is perhaps the most essential element for learning to occur. In normal cases this element is what separates entertainment gaming from professional uses. Analysis includes observing the game to be able to present critiques on how the game is played. However, it also includes what data are to be collected for the analysis and debriefing after the game. The after-action discussion circles around why players made certain decisions and provides a link between the players’ experience and the subject matter. Results show that this is critical for deeper learning to occur (Perla, 1990; Crookall, 2010; Lederman, 1992).

Adjacent or intertwined with military wargaming is gaming for entertainment purposes where war is the theme. Unlike the military uses of games, the entertainment sector primarily aims at stimulating and engaging its audience. The military usages of games can still, however, afford participants a great deal of satisfaction (McHugh, 1966/2011).
2. BACKGROUND

Games (and toys) with a war theme or influences of warfare date back before the dawn of written history (Perla, 1990). Historical games such as Wei Hai, the predecessor to the Japanese board game Go, and Chaturanga, which later evolved into Chess, have tested players’ strategic thinking in a military context (Smith, 2010). Although these symbolic board games may have been used for military purposes at one period of time, their importance decreased over time as warfare evolved and became more complex (Smith, 2010). It was not until von Reisswitz’s Kriegspiel that hobby wargame and a military interest really overlapped. From that event in time wargaming continued to be played in much the same way by both hobbyist and professional wargamers. Another important event from a hobbyist perspective was in 1958 where the board game company Avalon Hill was formed. The board games they produced were inspired by similar techniques used by the defence organisation RAND (Smith, 2010). Avalon Hills’ market was primarily North America, and a typical consumer was a single and well-educated man who had vast knowledge of war but little use for it in his daily job (van Creveld, 2013). The hobby wargamer community grew stronger during this period of time, and although professional and recreational wargaming share the same principles they differ in priorities (Sabin, 2012). Professional wargamers, as mentioned above, use wargames to study and train for current conflicts where the multiplayer game mirrors the uncertainties and complexities of real military command, which explains why the game is usually umpired. Hobby wargamers, on the other hand, seek to enact and reconstruct past campaigns from a ‘God-like’ perspective that does not require as many players (Sabin, 2012).

Later on, with the introduction of and technical development of computers, networks, and game software, the entertainment and the military searched actively for over-the-border collaboration (Zyda & Sheehan, 1997). They found so much mutual interest in each other’s affairs that some even named it “the military-entertainment complex”, paraphrasing the term military-industry complex from the Cold War (Lenoir & Lowood, 2005). Nowadays this joint venture can be seen in how computer and video games borrow narrative from contemporary and historical conflicts, and in how the military forms strategic plans on how to utilise commercial technologies and game design structures in their training systems, which means that what works for the military also seems to work for the entertainment industry. The same software sold to
the consumer market for entertainment are also used as training tools by the military, sometimes out of the box but more often slightly modified (Smith, 2010; Macedonia, 2002). What this indicates is that war and warfare lend itself well to games, which could explain why war is such a popular theme in entertainment games.

However, a more influencing factor for the military use of games is the position of games in today’s society. With the market growth of digital games played on PCs, game consoles, and handhelds, games have become more accessible to people and part of many persons’ daily life. This acquaintance and spread also implies that people develop ways of approaching such games; they learn to play games, recognising genres and ways of acting, adapting to the very specific interactions that the games encourage. If this is done primarily by consuming entertainment games, then the structure in these games is what shapes the interaction. When defence organisations make use of games there is a potential risk that the military personnel approach the games in a similar way as they do with entertainment games. This is something we will come back to in the discussion of our studies below.

2.3 SIFTING TRUTHS FROM ANECDOTES

The history of wargaming is fascinating from an academic perspective. The military has employed and evolved wargaming as a practice throughout the centuries based on insights on what works and what does not. This development approach has shaped the practice into pragmatic solutions, which also means that there have been few incentives to critically examine the legitimacy of the wargaming practice. This becomes clear when trying to find empirical evidence on the effects of wargaming. Wargaming literature comprises anecdotes or is based on self-experienced stories from professional wargamers (Rubel, 2006). Few results, if any, stem from any systematic academic approach, which would structure knowledge, explain the learning, and provide theories to help us understand the practice more. Rubel (2006) describes wargaming as a ‘craft’, in which practitioners operate by rules of thumb and tradition. This craftsmanship may be both accurate and valid, but the situation opens up some interesting possibilities for researchers in the game-based learning field. The wargaming practice is out there, ready to be investigated by researchers who can structure knowledge and hypothesise well-known assumptions to further our understanding of the field.
However, the situation is also unfortunate, as much of the understanding of the field is what Rubel mentions “tied to specific practitioners” and not to a solid body of structured knowledge. Approaching military wargaming critically would thus tie the practice to the academic domain that both sectors would be benefit from. The academic domain could learn from this long tradition of game-based military training, and a scientific critical approach would help articulate concepts and tie this practice to other fields of knowledge.

Despite the lack of documented studies on how wargaming is practiced, there are some texts that focus on unwanted effects of gaming. Rubel (2006) emphasises the relation between the wargame and the real world by describing a number of defects or so-called “game artifacts” that crop up in wargaming. Besides shortcomings in the game or the simulation itself, he defines invalid decisions from players as an artefact that is easy to understand but hard to detect. Invalid decisions result when players do not try their best, which will contaminate the results. A fundamental assumption in wargaming is that the players will make the best decision they can and not be “capricious or negligent” (Rubel, 2006). Rubel argues that if players are disengaged from the game then the outcome cannot be valid. Although this can be questioned from a learning perspective, Rubel highlights something that game theorists assume is important to the game activity – that the player is (emotionally) attached to the outcome of the game (Juul, 2005; Salen & Zimmerman, 2004). In other words, the game activity mandates that the players do what they can to win, which is similar to findings in business simulation games (Harviainen et al., 2012). The last artefact, according to Rubel, is harder to account for. It is the tendency for players to be more aggressive than they would in the real world. In the game the sense of safe environment may lure some players to constantly attack with their units, even in combat situations that are hard to win. Rubel speculates on some of the reasons. First, there are no real lives at stake in the game, and the players do not need to face subordinates’ criticism of putting them in unnecessary risk. Second, as the game is played for a limited time, there is no ‘tomorrow’ provided by the game. This time space played in the scenario may lure players to exhaust their resources or make absurd moves just to achieve a victory at the end of the game.

Perla (1990) also follows this line of argument when he claims that, as the representation of reality is less than perfect, professional players can
be tempted to “game the game”. By this, Perla draws attention to the tension between rules and fiction, as “game the game” is a reference to a rule-based interaction. An officer might, for instance, find out that part of a river in the game is crossable by any vehicle, which could be the result of a minor error during scenario construction or of a built-in approximation of the map. If the officer then chooses to use this river section as a ‘bridge’ for advancing own troops, then the officer still adheres to the rules but does so by blatantly exploiting weaknesses in the game’s representation.

The direct consequence of this playing style is that players drop out of their game roles, and this will most likely lead to a loss of suspension of disbelief, impeding what the game can accomplish (Perla, 1990). Finally, military theorist William S. Lind (1985) criticises the use of computer games to decide who wins the game. According to Lind, computer games are “worse than useless” as they only can reward kills and this will in turn shape players’ behaviour into ‘old school’ attrition warfare. Following the development of military theory in the twentieth century, today’s officers are required to think more comprehensively instead of just focusing on force-on-force fights. Thus, using a computer to declare a winner will only reveal the computer’s weakness: the ability to understand only a small fraction of what determines the outcome of modern warfare. Although this criticism was made while computer performance was vastly limited compared with today’s standards, Lind connects to other findings that issue warnings of using game-like features in military training.

These observations warrant further investigation into how games are used in wargaming practice, specifically to find evidence on how games may impede the learning worth solely because they are ruled-systems. Before we narrow down the research question it is worth reminding ourselves of two fundamentals of wargaming: they make use of a ruled system and participants are assigned roles where the fiction matters (McHugh, 1966/2011; Perla, 1990; Perla & McGrady, 2011).

2.4 RULED AND PLAYED AS IF

The wargame itself is a model, a designed challenge that simplifies aspects of interest in the war environment. Although the model might be realistic and accurate, it will never fully encompass all the aspects of reality; it will only simulate reality. Certain elements from war are designed into the game because they are regarded as central to the
learning objective. The rules are designed in the same way: they represent the goals and define ways of how to interact with the models in the game. Players need not only be aware of the rules but should also adhere to and accept them, as these rules are central to the designed challenge, which indicate that wargaming requires that players have a gaming or *lusory attitude* \(^3\) toward the activity (Suits, 1978/2005).

Players also assume roles in the wargame. The underlying idea is that the officers should relate to the theme (war) as they make their decisions. Although the game projects a fictional world in its own provisional way (Juul, 2005), players need to behave as if they were commanding real units on the battlefield. This role-playing attribute of wargaming is crucial for learning to occur. If the officers do not play the wargame with the envisaged orientation toward the game, the risk is they will not learn from their gaming as they are not experiencing the realism the game tries to portray. Whether this role is explicitly given to players or not, is of minor relevance as long as the players take the fictional world seriously. A player may for instance be given the role to play colonel of 2nd Regiment as this is part of the scenario. Yet, the scenario might not include such a detailed role description but instead simply rely on that players behave in accordance with the officer profession in general.

In summary, officers act upon the role of commanders while at the same time strive to achieve victory by enacting the rules. A potential tension arises when the players desire to enact the rules in ways that are uncalled for with respect to the commander role and the officer profession. Players might, for instance, find and use shortcuts that have no relevance in the real world.

In a wargame the rules may state that any player who crosses or holds vital bridges on the game map will gain victory points. A cunning player may then deploy many small troops, perhaps even dividing company-size units into platoons, to be able to manoeuvre larger amount of units in a point-hunting tactic. These troops may be strong enough to earn these points when placed near the bridges, yet may also be so weak and defenceless that any enemy unit could easily destroy them. No commander, under normal circumstances, would think and use this kind of inapt tactic in reality as the troops would be put to unnecessary risk. However, under a game rules perspective, which states that the one with

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\(^3\) *Lusory* is another form of the adjective *lusorious*, which means sportive or playful.
highest points wins, the tactic becomes relevant. Such a play-behaviour would be at the sacrifice of professional orientation and role-playing. In such play styles, the gaming is transformed into a duel of mastering the rules, where the representation of real warfare loses significance. The participants may enjoy such games, but the learning worth will arguably not be as good as it could have been.

This is the point of departure for this thesis: to expand the relation between the player and the game to expose this tension between a rule-focused interaction and a fiction-oriented interaction. I have chosen to investigate this by studying how wargaming is practiced in military education with a so-called in situ approach, which will further our understanding of games in education in general and also provide us with insights on how this tension can be resolved in wargaming practice. As this thesis operates in the realms of game-based learning I will provide some perspectives on learning that serves as a justification of my theoretical and methodological choice.

2.5 DIFFERENT VIEWS ON KNOWING AND LEARNING

Educational psychology encompasses many different theories of learning. This diversity stems from the different perspectives on knowledge and what it means to “have” knowledge (Greeno, Collins, & Resnick, 1996). In this summary I will group learning theories in the same way as Greeno and colleagues (1996) before arriving at a perspective that resonates with my view on learning in the wargaming practice.

Greeno and colleagues sketches three different general views on learning and knowing; Empiricist/Behaviourist View, Cognitive/Rationalist View and the Situative/Pragmatist-Sociohistoric View. Egenfeldt-Nielsen (2005) uses similar categories to provide lenses on how we can view learning through games. Each categorization reflect general views on knowledge, human thinking and learning, and although one might be tempted to put these learning theories in chronological order, where each new theory replaces the older, both Egenfeldt-Nielsen and Greeno and colleagues argue that they complement each other and that they can contribute to a multi-perspective view on learning. I will portray these viewpoints as distinctly as possible, separating them to reveal their different epistemological departure. In reality they are way
more complex, nuanced and varied than the account I provide here.

The Empiricist/behaviourist view on learning ties into natural science in that its goal is to predict and control behaviour. In classic behaviourism the way humans acquire knowledge is not as important as how she acquires behaviour (Phillips & Soltis, 2010). Consciousness is something that is seen unverifiable and should therefore be avoided (Watson, 1924/2007). Instead the behaviourists argue that we need to make us free from elusive and vague concepts in psychology and instead establish psychology as a true natural science (Watson, 1924/2007). For instance by turning to behaviour, which is something we can objectively observe. Knowing is seen as having connections of mental or behavioural units (Greeno et al, 1996) and with the theory of the stimulus-response association behaviour is understood as the response of an organism to stimuli in a situation (Skinner, 1953). Learning is thus the formation, adjusting and strengthening of these connections (Greeno et al, 1996). A typical learning situation with this view provides immediate feedback to students’ performance through so positive or negative reinforcement, which also highlight the importance to closeness to students’ performance as well as the need of repetition. A critique to behaviourism is that all learning is the product of the same underlying behaviour-shaping process, that is, responses to stimuli from the environment, which makes it hard to explain how we can learn a complex skill such as language. This critique is also evident when we turn to learning in wargaming. A behaviouristic explanation to learning in wargaming suffers from an overly simplistic view of what is supposed to be learnt. Tactics and strategy contains many wrongs and many rights, one can even argue that there is no right or wrong in making tactical choices, only successful and unsuccessful. This makes it difficult to create a learning environment where the preferred behaviour cannot be expressed in detail beforehand.

The Cognitive/Rationalist perspective can be seen as shift to human mind and brain as the primary study object. In here, focus is more on the cognitive abilities of the learner and with the premise that thought can be studied in itself. While behaviourism do not want to make claims on what is not directly observable a cognitive/rationalist perspective do the opposite and focus on inner ‘mental’ activities. It views humans as
information processing units (Newell & Simon, 1972). The cognitive discourse on thought and humans as problem solving beings borrows much of the terms and concepts from information technology. For instance, “information” is “sent” to us, we are “processing” information, and the information is “stored in memory”.

Knowing is seen as possessing structures of information and patterns of symbols which taken together makes us exhibit general abilities (Greeno, et al, 1996). Learning in this view involves building up these cognitive structures. With a constructive view we see human understanding as the active process of constructing cognitive schemas rather than passively assimilating information (Illegis, 2007). The development psychologist Jean Piaget argued that learning is initiated from a state of disequilibrium, which can be viewed as an imbalance in what we understand and what we encounter (ibid). This in turn enables two processes that explain how we learn by internalising the awareness of the outside world. In assimilation Piaget argues that we take new experiences or information and add them to our existing ideas. This is contrasted to accommodation in which we alter and adapt our existing schemas as a result of that we experience new information that does not fit to our existing ideas. This means that we are active agents in the learning environment with different abilities to construct schemas. What are formed during learning are mental models that represent patterns of behaviour as well as abstract images of the world outside the mind. A critique to this view is that claims are made on something that we cannot see or observe, that is, we cannot prove or falsify that our mind or cognitive structures are built up with mental models or symbolic signs of the world. Another critique on this view is what decides the imbalance between the cognitive structure in the mind and the world outside (Illegis, 2007). Is there an internal judge, a so-called ‘homunculus’, who can compare the cognitive structure with the outside world and decide of a state of disequilibrium?

A cognitive/rationalist perspective on wargaming means being interested on what inner structures are being constructed to handle military challenges. These structures would then create meta-abilities and higher order problems skills that are useful to an officer when tackling military problems in new situations. Although the cognitivist/rationalist perspective turns to the individual and recognizing differences between individuals, more is needed to explain how the context and interplay
between individual, the wargame, fellow learners and instructor support the learning process.

The third and last perspective, the *Situative/Pragmatist and Sociohistoric view*, is a family of theories that acknowledges the social dimension of human action, such as setting, practice, and community. This view sees learning as being shared among practitioners and can be seen as an escape from the dualistic view which is present in the behaviourist and cognitivist tradition (where the dualistic view states that body is separated from the mind, and the human physical action is separated from thought).

Among the family of theories is the *socio-cultural perspective*, which origins from the work of Lev S. Vygotsky and his thoughts of cultural history (Vygotsky, 1978; Säljö, 2000). Vygotsky emphasized to a larger extent on a child’s development in conjunction with the environment than the constructivist tradition. This means that the human development is highly dependent on the context and surrounding, which also implies that in the socio-cultural view thought or mind are not separated from action (Wertsch, 1991). The socio-cultural tradition is, however, related to the constructivist tradition in that knowledge is seen emanating from and being closely tied to action instead of being information that is transferred to a passive learner. Yet, with the social-cultural theory some actions are more important than others. The first is the use of sign systems such as *language and writing*, another one is the use of *tools* (Vygotsky, 1978; Säljö, 2005), both intellectual and physical. Together language and tools contribute to form so called social practices in which skills, knowledge and understanding is shared among its members.

The cognitive anthropologist Jean Lave and educational theorist Etienne Wenger, places a particular emphasis on how learning is relative to a specific situation in their theory *situated learning* (Lave & Wenger, 1991). Lave and Wenger argue that the specific situation will shape what learning will occur and what kind of knowledge is activated. We interpret and conceive the world around us as an interplay between already established knowledge and the concrete situation, which means that knowledge as well as learning is always context dependent.

The knowledge we want the learner to acquire thus needs to be presented in authentic context, exposing the learner to situations
involving that knowledge. Lave and Wenger argue that with the central process of legitimate peripheral participation learners will over time move from being newcomers toward full participants in sociocultural practices of a community (Lave & Wenger, 1991). In these practices groups of people share a craft or profession. Members learn from each other by sharing information and experiences, and each member benefits both personally and professionally.

The different learning theories provide different lenses on how we can see learning in wargaming. Before discussing my choice of learning theory, the socio-cultural perspective, let us revisit just how wargaming is a part of the military profession. The officer profession can be seen as a collection of different practices: training of recruits, operation planning, command units in battle, manage weapon systems, work as a staff officer and so on. Wargaming can in this sense be seen as a tool to support officers becoming members of one practice in the military profession. However, officers have limited opportunity to practice their profession during peacetime, which in terms of social practices is similar to a chef that has limited access to a kitchen, but who is still required to develop cooking skills. Therefore wargaming and all supporting activities around war, such as field-, staff exercise and combat training become essential practices by themselves with the conclusion that they also must be seen as integrated elements in the military profession.

### 2.6 LEARNING IS SITUATED IN THE WARGAMING PRACTICE

If we accept wargaming as its own social practice it follows that if we want to study learning effects or make other claims, we have to study it as it unfolds in a realistic settings, that is, where it is practiced. We have to see it as its own intact system with specific norms and activities that uphold this practice.

The situations in which we act influence to a great deal our behaviour and abilities. Lave (1988) describes situations where persons solved everyday mathematical problems without any problems, for instance comparing unit prices in a grocery store. However, the same individuals found similar mathematical assignments hard to solve in a school environment. This arguably shows the influence of situation and activity on our abilities. In a study of voluntary behaviour (Manuilenko, 1975), young children were given the task to stand completely still as long as
possible. By varying the conditions of the activity so that the instructor framed the activity differently entirely diverse mean values was measured between the conditions. In one condition the children were simply told to stand still, another condition required children to stand still as part of a playful activity, and as extension of this, another condition stipulated that the children should compete with each other who could stand still for the longest period of time. The competition framing of the activity produced longest measured mean value among the children as if the competition framing motivated the children. Manuilenko argued that the children could relate and connect to the task in an inspiring way than just being told to stand still. Extending this argument with the socio-cultural perspective on a situation there is no neutral context; all human action and communication must be understood in relation to the context it is part of.

The importance of communication and language is perhaps obvious in today’s society. However, the socio-cultural focus emphasizes the close relation between communication and thought (Vygotsky, 1978). In the traditional rationalistic view, thinking is an internal affair, however, with the socio-cultural perspective thinking is extended with its collective and communicative attributes. This specific view on thinking will influence how we understand learning. When thinking also includes the communication between individuals the boundaries that knowledge only exists within an individual are crossed. We further our understanding and extend our knowledge by sharing, comparing and discussing experiences and skills in specific situations. By this we advance as individuals and create conditions for learning to occur. In wargaming, members communicate and share experiences on how to solve military tactical problems. The ideas are brought up for discussion, plans and solutions are negotiated and coordinated, and critical issues such as risk and uncertainty are part of the dialogue between individuals to enhance their understanding of what is happening and what can and should be done. Learning emanates through this communicative process as the social practice of wargaming encourages a practice-specific terminology and the knowledge is enacted in an authentic context.

Tools get a new meaning with the socio-cultural perspective as a consequence of the complex world we live and act within. To make the world more comprehensible and to be able to act in the environment we live in, we make use of intellectual and physical tools (Vygotsky, 1978).
Paper, pencil, calendar, mobile phone, microscope, terminology and measuring system are all examples of tools that we have developed to establish activities and solve problems. An officer with tactical skills and knowledge can be seen as an expert member of the practice to solve military challenges. In this aspect we can see tactics or tactical skills as an intellectual tool, as the commander’s intellectual aid to achieve the military objectives. A skillful officer will see opportunities and alternatives in a situation based on the solutions provided by the intellectual tool. Learning of tactics will in this reasoning be the process to develop and enhance this toolbox.

With this view thinking cannot be separated from action or situation. To understand human action it is necessary to understand the individual, the social practice and the tools used, as they all define each other. If we detach any item from the other by, for example, study activities in a laboratory environment (where humans are deprived of the normal tools used in the specific context) a different action will appear. Preserving the relation of these items in an activity is thus important to be able to make valid suppositions of human action in a specific situation.

However, this thesis will not seek answers to why wargaming is beneficial to officers’ learning processes. Nor will I attempt to measure or assess officers’ learning through games. Instead the focus is solely on how officers handle the identified tension between rule-focused interaction and theme-oriented interaction. Through this focus I aim to provide answers to how the tension influences conditions for learning. The theory I have chosen, the socio-cultural perspective, offers a means to identify tensions that affect the conditions for learning tactics.

A socio-cultural perspective has implications on how I should study members in a wargaming practice. I need to take into consideration all resources an officer uses to make sense of the game situation – including the game artefact, dialogue with other students, setting and the instructor. This in turn mandates a broad collection data when players engage with the artefact, which I have chosen to do through video recordings. Here I have taken inspiration from other socio-culturally inspired studies of games and learning that preceded me. Linderoth studied children’s meaning-making processes when playing entertainment games. He performed detailed interaction analyses based on video recordings (Linderoth, 2004). Bennerstedt studied what knowledge is embedded in leisure game practice and how that knowledge
has transfer effects to other domains (Bennerstedt, 2013). Peterson (2011) analysed video-recorded play activities with open-ended games to find out what values and norms are enforced (or challenged). In addition, other scholars have used a slightly different theoretical grounding, yet still used video analysis of gaming as means to understand how gaming is embodied in specific situations. Sjöblom (2011) used video data from gaming sessions at an Internet café to understand aspects of collaborative gaming. Squire looked at how a commercial game with historical theme remediated students’ understanding of history by observing and analysing video recordings of learners (Squire, 2004).

The socio-cultural theory does, however, only provides a particular stance towards learning and meaning emanating from the specific gaming situation – it does not predict or dictate how it will unfold in a specific situation. My contribution is therefore not theoretical, nor an argument pertaining to the advantages of the associated methodology. My unique contribution is instead to provide *empirical* findings of what learning with the game artefact means to military practices in the specific setting where I studied it. In the next chapter I will present an introduction to how wargaming is practiced today and continue with explaining how the ‘situatedness’ of learning through wargaming entailed engaging with specific study methods.
3 METHOD

Many studies have investigated the relationship between games and learning (e.g. O’Neil, Wainess, & Baker, 2005; Hays, 2005; Kirriemuir & McFarlane, 2004). Although this thesis can be seen as connecting to this line of research, it does not share the same goal: determining whether learning is improved or failing when players engage with games. Instead the scope of this thesis is limited to identifying problems and barriers when playing to learn, that is, I will only make claims pertaining to the conditions for learning in the wargaming practice.

This inquiry was not the original idea that I started from. Similar to other approaches, both from academic and industry initiatives, the initial idea was to find evidence on how well-designed games could qualify as a preferred learning method compared with others. This research approach changed over time as I became aware of some of the issues of military wargaming. Below I will provide an overview of the methods used to answer the research questions, which is a mixed methods approach. Let me start, however, by describing what inspired me to change the direction of the research, shifting my focus from the game design to conduct studies of gaming in action.

3.1 FROM DESIGNING FOREIGN GROUND TO STUDIES OF WARGAMING

My first, design-oriented, work on this topic, aimed to explore how digital games could be used for non-entertainment purposes (Frank, 2000; Frank & Lundblad, 2003). These ideas later coincided with the Serious Games movement. In short, this movement studies the use of commercial games, game technology, and gaming for other chief purposes than entertainment (Michael & Chen, 2006). My approach at that time was to find some of the general design principles that would guide serious games creators in developing products that combined the fun aspects of games with learning objectives.

In my first pilot project, Foreign Ground, we developed a serious game aimed to be both an engaging game activity and an activity to enhance military training (Frank, 2007). The research inquiry was, through design and evaluation, to find general principles on how to design such games. With Foreign Ground, a so-called first-person thinker game, we created a learning situation in which players participated in various patrolling tasks
set in a foreign country. The aim was to demonstrate how this kind of game could be used to prepare UN personnel for international peace-keeping missions. Officers and soldiers that were about to be deployed in an international peace keeping mission would play our game before deployment to familiarise themselves with conditions of that region. In this sense we designed a game that was not designed around violence and combat, but focused on everyday tasks as the Swedish soldiers were faced with, such as patrolling, information retrieval, and reconnaissance.

I found three general design principles important for developing Foreign Ground (and similar training games): (1) to create an engaging game by carefully crafting the gameplay, (2) to make sure to cater to the training objective, and (3) to allow the training context surrounding the game to influence design decisions (Frank, 2007).

![Figure 2. Screenshot from the game prototype Foreign Ground. The player controls a UN soldier on patrol in Liberia with the mission to interact with locals, gather information, and prevent escalation of violence.](image)

However, the direction of my research changed after a deeper examination of the pros and cons of introducing gaming to military training. First of all, I realised that the engagement and motivation that
arise from the gameplay are in many cases not necessary nor are they even desirable for several reasons. In simulators and trainers that are used to learn a specific skill (the so-called skill trainers), the suitability of engaging gameplay is questionable. An engaging gameplay is more appropriate for tasks where there are many choices, and not a single right and many wrong action choices as in skill trainers. The game designer Sid Meier argues that gameplay can be seen as “a series of interesting choices” (Rollings & Adams, 2003) – that is, games must provide the players with many alternatives, some that will take the player closer to the game goal. If a skill training game comprises an engaging gameplay it risks conveying that there are many permissible ways of solving a task. Or worse, the skill trainer becomes a distraction from learning a specific skill-set, as the learner is encouraged to try out various strategies – not understanding which ones are the preferred ones that should be learned.

Second, a large part of military education already includes gaming as a learning method. Warfare itself is a sort of a game (Huizinga, 1970; van Creveld, 2013) where the objective is to overcome the opponent by the resources available. So there are few incentives to introduce new design principles to nurture motivation and engagement, as gaming is already an established practice in the military.

My thinking at the time was that there should therefore be a rich literature on wargames and their role in military training that I could use as a basis for my continued design work – shifting away from the skill trainers and instead looking for other relevant settings for my design experiments. Instead I discovered that there were almost no empirical studies on wargaming in military training. I also noted how commercial computer games were already being used at my workplace, Swedish National Defence College, to train officers’ tactical thinking. It seemed like an opportunity for me to study what was already used, to gain a better understanding and empirical evidence on how to work. I therefore decided to spend some time in classes that used games to train tactics.

However, although the military already embraces gaming as a learning method, observations on how wargaming is practiced were scarce. During a staff-level course with wargaming I witnessed several symptoms that could be explained by participants’ orientation to just win the “game”. In these cases the wargaming session became more or less reduced into a competition that posed a problem to the learning objectives. The goal was to develop skills in tactics and familiarise the participants with staff
procedures. During the game, however, the participants’ roles became diminished and staff hierarchies collapsed, and I could observe an unmotivated risk tendency among those who issued orders. Furthermore, I saw how certain features in the game were exploited to gain unfair advantages against the opponent. I asked around and was told by instructors at the school that they had also observed some of these negative behaviours. They had witnessed a fierce winning attitude in some participants when engaging in competitive exercises. I asked myself if this was an inherent problem to all game-based learning. The staff officers’ behaviour reminded me of players immersed in playing entertainment games or practicing sports. I speculated that the activity itself lured them into adopting an attitude, a so-called ‘gamer mode’ orientation, instead of behaving professional toward the activity as officers. After tentatively naming the term gamer mode I became inspired to explore the concept further. One reason for pursuing this work was that gamer mode represented something that was already familiar to military instructors. The other reason was that gamer mode was on the one hand something positive, that is, engaging players with a strong winning attitude, but on the other hand gamer mode also seemed to damage the learning situation in the staff course.

Further exploring gamer mode intrigued me and made me change my research focus, abandoning educational game design and instead focusing on studying learning games in action. I did not foresee all the research questions from the start; my understanding of the concept of gamer mode grew as I studied the literature on games and, above all, after conducting the initial studies. The questions became articulated alongside my empirical work on documenting gamer mode, drawing my attention to the roots and consequences of the gamer mode phenomena.

3.2 RESEARCHING GAMES IN ACTION

As discussed in the Introduction, this thesis investigates what games mean to the wargaming practice. I have chosen to study wargaming from an interactionist point of view, as finding out what governs and influences players’ strategies is revealed by detailed analysis of players’ interaction. The reason I have taken on an interactionist perspective is that I acknowledge the situation’s influence of the learning, meaning I see learning emanates from the specific situation where wargaming is used (Brown, Collins, & Duguid, 1989).
The situated learning perspective assumes that playing a game will provide learners with experiences that will be beneficial to learning; the activity is central for learning to occur. Although few game researchers would disagree, the various ways research on games and learning is conducted illustrate that studies on the gaming activity is something almost neglected in educational science (Arnseth, 2006). Yet as noted in the previous chapter, approaches with similar inquiries have in recent years appeared with studies of games in action with a socio-cultural departure.

Linderoth (2004) research on children’s meaning making was described in previous chapter. Linderoth’s thesis was one of the major reasons I decided to change direction of the research as studies of games in action intrigued and inspired me. I felt that his way of unpacking what the children were really doing when playing could be the way I could unpack the gamer mode problem. Later I found other similar work that reinforced my conviction that this was a fruitful path to study players behaviours in action.

Peterson (2011) also used video recordings of gaming situations when children played so called open-ended games. She used theoretical tools from the socio-cultural perspective on learning and communication to reveal what meaning and values are negotiated during actual game play. Although these games have the potential to challenge players’ values and norms Peterson instead found that the prevailing attitudes were reproduced in the gameplay. She found that players’ sociocultural experiences were used as an active resource in players’ interaction with the game.

Bennerstedt (2013) made use of video recordings and an ethnomethodological approach in her thesis to understand what knowledge is produced from playing an entertainment game. She studied both verbal and non-verbal communication between players participating in cooperative challenge in a massive multiplayer online game. Her choice to conduct auto-ethnographical fieldwork by playing the game herself provided her with detailed insights into the practices that gamers are involved in. This enabled her to access the setting where specific terminology and knowledge was used. Furthermore, she was given ability to video record activities that would be impossible without her role as a participating researcher.
My approach thus follows others in providing contributions to gaming studies where the situation is central and where different surrounding resources is acknowledged to shape players interaction. Before explaining the methods used in the studies, I will describe the context in which the studies took place, illustrating how wargaming is used in the Swedish military curriculum. The key message here is that wargaming is not an isolated activity in the educational program; other learning phases precede and follow the activity. The main reason I provide this context in such detail is that such context would make it easier to follow and understand the studies presented in the next chapter.

3.3 HOW WARGAMING IS UTILISED IN THE MILITARY CURRICULUM

As mentioned in the background, educational wargaming is used for learners to exercise decision-making. It is essential to recall that the combination of the game, the environment, and the procedures provides the means for and influence the decision making, and if we are to make studies on wargaming that means we should include and relate to all influencing elements. This section explains the context in which the studies took place to provide a richer picture of how the different elements are connected. Although I performed some manipulations in wargaming with the cadets during the years of my studies, it is worth remembering that the wargaming activity I studied was primarily part of the educational program and not an experiment done solely for the purpose of research. This means that I, as a researcher, needed to balance my manipulation intentions against the goals to achieve the learning objective. I could not, and should not, modify the gaming conditions to the extent that some students were completely deprived of their learning.

The wargaming block is part of course named “War Studies Intermediate Course in Land Tactics”. The course is given to cadets within the Officers Programme, which is a three-year undergraduate programme conducted over six semesters. Prior to this part of the course the cadets complete the “War Studies Basic Course in Land Tactics”, in which they learn basic land warfare tactics at company level as well as simple tactical assessment. In their follow-up course, containing the wargaming block, the learning objective is to further their understanding of land warfare. Cadets learn the capabilities of units at battalion level, plan an operation, and learn how to transform their plans into orders. The course lasts for a period of eight weeks divided into four blocks. The
first block contains instruction on military theories and doctrines (set of standard and advocated ways on how to act in a military operation). The second includes the learning of organisations and how different systems create a desired effect depending on their objectives. The third block concerns learning of planning procedures at battalion level, which usually includes practical learning blocks where the student use their understanding of warfare and tactical thinking. In this third block one week is dedicated to wargaming. The fourth and last block is a summary of previous phases where students write essays on tactical assessments and attend a field exercise. During this exercise the whole class apply their knowledge in the field, i.e., they discuss tactical manoeuvres in relevant terrain under simulated war conditions.

Prior to the wargaming in the third block the cadets perform planning using predefined procedures. To this purpose the cadets use an applicatory example, applex, in which they play a battalion staff in Operation Pajazzo. Set in Italy south of Rome, Operation Pajazzo is a fictitious scenario that was created specifically for this course. It is a modernised version of the Battles of Monte Cassino that occurred in January to May 1944 during the Second World War (Atkinson, 2007). In the Italian Campaign the allied forces were advancing towards the liberation of Rome. However, fierce defensive measures from the Axis forces around Liri valley and the city of Cassino stopped the Allied advancement. The fighting was severe, the bloodiest in the whole Italian Campaign. Although the Allied forces were superior in number they needed four large assaults to break the German defence lines – named the Gustav Line. The Germans defended the Gustav Line well by using the weather and terrain to their advantage. The monastery of Monte Cassino, high up on a hill was first spared from the battles, but in February American bombers completely destroyed the buildings in a massive airraid as Allied commanders thought German paratroopers took position up there. The destruction of the monastery stirred up many emotions around the world. Furthermore, to the surprise of the Allied forces, the Germans took position in the ruins only after the bombing, and were able to withstand Allied attacks for another three months.
These Battles of Monte Cassino are the inspiration for Operation Pajazzo. Although the terrain in Operation Pajazzo is the same as in 1944, the units and equipment are modernised. The brigade that advances north is based on a Swedish brigade, and the defending side does not consist of Germans but of forces using the same equipment found in a large country east of Sweden.

Cadets are given orders from the brigade to plan an advancement of their 2nd Mechanised Battalion to solve higher commands objectives, which are roughly the same kind of orders given in 1944 to the Allied forces. The objective is to advance and hold the valley around the city of Cassino, just south of the Monte Cassino monastery. The students in the class are divided into several planning groups so that all cadets are given the opportunity to practice planning procedures. In the end, all cadets plan the scenario before the wargaming and thus exercise planning

Figure 3. The ruins of Cassino, May 1944: a wrecked Sherman tank and Bailey bridge in the foreground, with Monastery Ridge and Castle Hill in the background. © IWM (TR 1799). Source: http://www.iwm.org.uk/collections/item/object/205188889.
procedures as well as create a general idea of how to conduct the operations.

Figure 4. Terrain map for Operation Pajazzo, which provides the situation brief. From this the cadets are to perform procedures to plan an advancement of the 2nd Mechanised Battalion (subordinated the 2nd Mechanised Brigade in the lower right of the map). The 2nd Mechanised Battalion consists of two tank and one mechanised companies, and a supply and headquarter company. The objective is to first advance on line A3, then to advance for combat formation along B3. The last phase is to take combat formation along C3. Intelligence reports of an enemy air drop of company size in the valley area. Furthermore, intelligence says an enemy mechanised battalion is advancing south.

During the wargaming week, cadets are given the opportunity to test their plans and exercise decision making. One of the motives to include wargaming in a course like this is to make cadets aware that any plan is exposed to changes when the operation starts. Many events and opportunities will emerge that need to be coped with as the cadets struggle to achieve the military objectives. Normally the plan acts as guidance, and will more often than not be revised as new opportunities and obstacles unfold. This is also one of the benefits of wargaming, as the ideas formed during the planning phase are based on assumptions and need to be revised and corrected as the enemy probably will behave
differently from expected. Wargaming also provides a fair amount of so-called micro-situations that need to be solved and explained as they emerge, which will further the cadets’ understanding of warfare.

As they wargame they will be given the opportunity to experience and learn the principles of tactics. In ground warfare these principles serve as an intellectual guidance in planning and execution of ground warfare operations (Swedish Armed Forces, 1995; 2013). The foremost principles are objective, focus of effort, surprise, and freedom of action. The objective simply emphasize on the importance to establish, communicate and insist on clear objectives, that is, what is to be achieved. Focus of effort is to concentrate forces in time and space so local supremacy and decisive points can be reached. Surprise can be reached by acting in high tempo and unexpectedly which will contribute to that local supremacy will be reached. Freedom of action is the principle to find ways to prepare for the unexpected. By stating clear goals, purpose, rules of conduct, command units in flexible manner and preserve combat readiness the freedom of action can be achieved. This in turn will enable that the initiative is kept and local supremacy can be reached. All these principles have to guide the cadets in their planning and execution of operation. There is no strict wrong or right way in how to apply these principles to reach the military objectives, which means there is room for creativity. Yet using the principles in a creative manner mandate that the cadets understand and have basic knowledge of the principles, similar to a musician who first must learn how to play the instrument before being able to improvising a piece of music. Wargaming serves the purpose to embed all these principles in a narrative through the wargame scenario so the cadets are given opportunity to see, plan for, and understand the principles in a context.

The wargaming week starts with a tutorial on the digital game, The Operational Art of War (Talonsoft, 2006), which is a commercial game used for simulating Operation Pajazzo. This game is chosen for its ease-of-use, and because it holds all necessary features for conducting ground warfare at battalion level. After basic acquaintance of all features in the game, the operations start. One of the steps in the planning procedure is to assess what the enemy could do. By such reasoning, the cadets focus on the operation from the enemy’s perspective, which is not only important for making their own plans but is also needed as the cadets are playing as the opposing force during the wargaming week. The scenario is played in
duels with two to three people on each side, red against blue. The cadets do not play against the computer, as prior experiences with the computer as an adversary easily leads to exploiting the shortcomings in artificial intelligence. Moreover, according to the teachers, it is valuable that the adversaries be as clever and as unpredictable as possible. Playing against a human opponent also provides a better after-action review process where both sides can reflect upon their decisions and inform each other on their strategies.

Figure 5. The scenario Operation Pajazzo in the game Operational Art of War (Talonsoft, 2006)

The turn-based computer game is played on a hexagon map where each competing side has fifteen minutes to complete a turn. The battle continues for ten full turns. In the end, the players discuss the state of the game and the whole game session under the direction of an instructor.
3. METHOD

After completing a game session, which includes a debriefing discussion, they start all over by playing a new game session, but this time against a new opponent. A duelling side also alternates between playing the blue or the red side to provide experience of playing both sides of the conflict. An instructor follows the gaming session as much as possible to assist cadets when problems arise and to support the learning process. However, the instructor does not interfere with the decisions made, as the teacher wants the cadets to see and understand the consequences of their actions.

The number of duels played depends on how much time is available to wargaming. From a learning perspective the teachers believe it is valuable to conduct as many duels as possible. When wargaming is played in a ‘free’ manner, meaning that situations develop as a consequence of player actions, many situations can be useful for discussions during and after game sessions. These events provide excellent means to make cadets understand and deepen their knowledge of warfare, for instance, to understand why a certain situation emerged, what capabilities units have, and the possible outcome after issuing an order. After all gaming sessions have been played the whole wargaming week is discussed with the cadets. Teachers have found it important to schedule this discussion a week after the event, as some of the experiences they had will “grow” over time and provide cadets with future insights (Pate & Mateja, 1979).

When scheduling a typical wargaming week one day is reserved to familiarise with the computer game. This is normally done by playing a tutorial scenario to learn all the game features. The following day and a half are spent playing the Operation Pajazzo in three duels, each of which typically takes two to three hours to complete. Every duel is followed by a debriefing session led by an instructor and that usually takes 15 to 20 minutes.

3.4 RESEARCHING AN ACTIVITY

The main reason for conducting research on wargaming, by studying how it is performed in the military curriculum, is that we are investigating issues of using gaming in a learning context. We want to make sure that student expectations – the reasons the students are there in the first place – are preserved in our studies. Other approaches, as in setting up a laboratory experiment, threaten to reframe the pedagogical context into
an experiment that replicates a learning environment, which I believe will influence player behaviour and therefore impair the data.

I am interested in cadets’ game play, which is an elusive and complicated study object. If cadets believe the gaming situation is not a real learning situation, the risk is they start treating the gaming situation in an unserious manner. As described in the background and above, wargaming is one element among other learning phases, and if we want to approach this method critically we want to preserve dependences and influences from these other learning blocks; otherwise, we risk lose the ecological validity of the study object.

The situated learning aspect together with my approach to take on an interactionist perspective on wargaming is from a theoretical standpoint in accordance with the situative perspective (Collins, Greeno, & Resnick, 1992). This view approaches a study object as an interactive system of activity and acknowledges influences from other subsystems. This means that more aspects are taken into account than the behaviour and cognitive processes of an individual agent (Greeno, 1998). The context in which an individual acts is not treated as a single instance but is seen as consisting of many interacting objects that combined explain an activity. The situative perspective thus includes how people interact with others and with physical or technological systems. Researchers search for patterns of regularities in an activity within specific communities of practice, in our case wargaming. This means that the whole wargaming context becomes important and informs me, as a researcher, what and how different elements contribute to learning. By investigating the activity as an intact system, including a multi-person and a human-technology system, conclusions can be made on how this system works (Greeno, 1998). By this a situation can be explained by exposing properties of the social interaction between instructor and learner, how challenges in the learning environment are addressed and especially how the player interacts with the wargame.

A suitable technique to make sense of a wargaming situation is by conducting interaction analysis (Jordan & Henderson, 1995). In interaction analysis, which is rooted in ethnography, it is assumed that knowledge and action are situated in particular social and material ecologies. If we are to make claims on knowledge and practice, we must use other means than to analyse what is going on in “the heads of individuals” through questionnaires and surveys (ibid.). Instead the goal
in interaction analysis is to find regularities in the way participants interact with object and actors within which they operate without making speculations about what is going on in people’s heads and their abilities. Instead, only that which is overtly observable is used to explain what happens.

This requires ways to record such situations – and to do this as richly as possible. Video recording is such a technique that holds several advantages compared with collecting observational records (Heath, Hindmarsh, & Luff, 2010; Jordan & Henderson, 1995). First, the video events are reconstructed as a shared resource to overcome differences in what people say and what they actually do (Jordan & Henderson, 1995). Second, video data provide an incomparably richer record of events than observational notes, and the video tapes can be replayed to better understand a situation. Third, the events that unfold can easily be traced back to help researchers find clues on what happened before an event and what happens afterwards.

My study object is wargaming and how it is practiced, however, not all aspects or phases of wargaming are of importance. The specific situation my interest concerns is how players make sense of the game situation when they play the wargame. Wargaming contains other phases such as learning to play the game, briefing, re-planning, debriefing, which are all important but not within the scope of my studies. Here I instead focus on the actual gameplay when players are familiar with the tool and they conduct the military operation. In my analysis I seek particular and naturally occurring events when players interact with the game to find clues on problems that have a rule-focused interaction. By recording the cadets’ interaction from behind with video cameras we can capture their interaction; body positions, gaze, gestures, and how they control the game. These data are supplemented with audio recordings from two microphones above the cadets to capture their utterances. In this way it was easy for me to determine who said what in the group. Furthermore, I logged screen captures with a frequency of one frame per second. This enables an observation of the game state, which is essential to understand the action performed in the game as well as the response to the game. All these data are analysed with help of a tool called F-REX (Andersson, Pilemalm, & Hallberg, 2008) that enables synchronisation and analysis of several data sources to build up a rich picture of the whole wargaming situation.
When I look for certain recurring interaction patterns, for instance in searching for rule-focused interaction in the first study, I rely mainly on what the cadets say to each other and their actions in the game. One of the main difficulties of trying to make sense of a situation is trying to understand why individuals act as they do. With restricted access to the individuals’ mind, I have to rely on the cadets’ reasoning with each other, their gestures, and what actions they perform. More specifically, I am interested in how the cadets treat the military units they are controlling. If players make moves or if they comment on the units according to the unit’s true representation, I categorise their actions to play as if they acted with a professional game orientation. However, if they treat the units only to their demonstrated effect in the game, I categorise them as having a rule-focused interaction. Besides treatment of military units, I also search for interaction and dialogue uncovering how game players make sense of the whole wargaming situation – only as a game or also as a proper representation of warfare.

These situations are difficult to find, but when they emerge I mark the time in my field notes, and then the real interesting work begins. From this point the situation is rolled back to reveal clues as to why the event occurred. Did the cadets do anything special or say something to each other that explains their actions? Or did the situation emerge as a result of the outcome of the game? What occurred in the surroundings, what could be said about the instructor and fellow learners’ role? And what are the visible consequences of performing these actions? After I move back and forth in the recordings, all these questions get their answers as I get a sense of the specific situation.
The situative perspective is associated with qualitative research methods, but I chose a mixed method approach, where I switched to a quantitative analysis after the qualitative method. The rationale for the qualitative approach is the desire to unpack the interaction between the player and the game, and how different elements in the pedagogical context are used as resources in structuring the interaction. Additionally, to get even closer to the problem I manipulated some of the conditions in which the cadets were instructed to play the wargame. The game was changed so that half of the cadets played the game with victory points, whereas the other played without any scoring system. Here the idea is that play behaviour, governed by different game conditions, will influence the game into measurable effects. The digital wargame we use contains features to reload the scenarios. With this I can study and compare game sessions to find out how the battles are fought. As I am interested in both identifying signs and consequences of rule-focused interaction, I hypothesise that different play behaviour will generate a measureable

Figure 6. Video and audio recording of a wargame session that later can be analysed with multiple-source tools.
effect in the game’s end state, that is, the outcome of the battle. This quantitative analysis complements the qualitative studies on interaction to form a mixed methods approach, which increases my understanding to not only identify how wargaming is played but also to identify what the consequences are.

The first study was of an explorative nature (qualitative). The aim was to find the signs of rule-focused interaction, that is, gamer mode, at the expense of a professional orientation towards warfare. As reported in paper I, I found a whole range of such instances. In particular, I became fascinated with the situations in which cadets discussed the realism of the game, which is why the second study became directed at revealing the interaction when players perceive the game to behave in unexpected ways – diverting from the reality it was supposed to portray. This study was also analysed qualitatively, as I was interested in the players’ reasoning and whether I could identify player behaviours that changed as a consequence of these unexpected events. In effect, I wanted to know whether game artefacts lead to an increased risk of gamer mode and if we, by designing the game rules in better ways, could prevent gamer mode.

In the third study, given my insights on what in the games might trigger gamer mode, I went on to manipulate the game to study the effects of gaming under different conditions. Here I manipulated the game design, playing the game with or without a scoring system, to identify differences in play behaviour. Analysis of the end state clues reveals how the game is played throughout the game session, i.e., what tactic is employed. This is possible because the game log gives me access to the military units in the game. Before considering this manipulation I took measures to guarantee that the cadets’ learning was not compromised. Playing with or without a scoring system was a minor manipulation, and in dialogue with the teachers we agreed upon discussing this manipulation with the cadets after all the game rounds had been played. This was done to minimise any effect the manipulation had on the cadets’ learning. As discussed above, however, the activities within the game are not the only factors that determine whether or not we get good learning behaviour. This is why, in the fourth study, I dig deeper into the instructor’s role in educational wargaming sessions. Focusing on the instructor was a result from the earlier studies that highlight that various problems during game play can be resolved by an informed instructor providing relevant feedback at crucial moments.
3. METHOD
## 4 Results

<table>
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<th>Study</th>
<th>Problem</th>
<th>Method</th>
<th>Results</th>
<th>Implications</th>
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<tr>
<td>Study I</td>
<td>Find occurrences of gamer mode in educational wargaming.</td>
<td>Qualitative analysis of player-game relation in a military tactic course using wargaming.</td>
<td>Found occurrences of gamer mode. This influences learning worth as the actions are based on reasoning not in line with the learning objective.</td>
<td>Games with a goal-directed main task may (sometimes) distract from the intended learning objectives. That is, gamer mode exists and can be viewed as a rule-focused activity (derived from the game rules).</td>
</tr>
<tr>
<td>Study II</td>
<td>Find discrepancies between player expectations and the game, as they can disturb the balance between rule-focus and role-play.</td>
<td>Qualitative analysis of player-game relation in a military tactic course using wargaming.</td>
<td>Negative outcome triggered players to either (1) reject results and change behaviour or (2) accept outcome and inquire into the reasons why.</td>
<td>The games’ perceived realism may change player behaviour into unwanted directions such as gamer mode. However, it could also become beneficial to learning.</td>
</tr>
<tr>
<td>Study III</td>
<td>Study the effects of game features on player behaviour. Compare differences in tactics employed when the game design is modified.</td>
<td>Quantitative study of the tactics employed by analysing the end state of the games played.</td>
<td>Players altered their tactics. Explicit reward structure suggests of an unwanted tactic with respect to the mission objective and that they played to win the game – not to gain realistic strategic knowledge.</td>
<td>To use game-like features with explicit rewards is to lure players into behavior that will jeopardise the desired behaviour of the player. Thus, game-like features in the design (which can be changed) can lure players into gamer mode.</td>
</tr>
<tr>
<td>Study IV</td>
<td>Study the instructor’s role during game play to deal with gamer mode issues.</td>
<td>Argumentation based on examples from wargaming sessions where the instructor facilitated behaviour.</td>
<td>Two main responsibilities: (1) Frame the situation, where the instructor’s task is to constantly remind learners of what is required from them. (2) Steer the learning process, to uphold the link between the game – and real world.</td>
<td>Gamer mode can be controlled but this requires an instructor with skills in wargaming, the underlying game model, and warfare. Requires active role in the gaming process, intervening when needed.</td>
</tr>
</tbody>
</table>
I have studied how the participants act out the tension between having a rule-focused orientation and a theme-focused orientation toward the game. This task was addressed through four studies, summarised below and further described in the papers I to IV. Before describing the studies, however, I need to clarify what I mean by player attitude, which is a term used in the articles describing the studies.

In the articles I argue that players may adopt two different attitudes toward the situation: a lusory attitude and a professional attitude. In social psychology, attitude research is fundamental because it provides answers to why people do what they do and why they behave in certain ways. Although there are many different definitions of attitude, it generally refers to beliefs and feelings related to a person, object, or an event (Myers, Abell, Kolstad & Sani, 2010). By this, one can see it as a person’s evaluative reaction towards something. When psychologists study attitudes they often make use of questionnaires to measure a person’s attitudes towards specific issues. A problem with this method is that it measures expressed attitudes (Myers et al., 2010), and these are almost always exposed to outside influences, for instance when subjects respond to what the researcher wants to hear.

What I mean by attitude, however, should be understood along the lines of how Bernard Suits defines it (Suits, 1978/2005). With lusory attitude Suits means that the players need to understand and accept the principles of the game. He argues that the rules of the game “...prohibit use of more efficient in favour of less efficient means”. Although there may be more efficient means to achieve the goals of the game, the rules prohibit such a use, for instance as in grabbing and throwing away the opponent’s queen in chess instead of capturing the queen by moving your own chess pieces. Gaming requires a lusory attitude among participants, as there is hardly a game activity if no one is willing to accept or play according to the rules. Professional attitude, which is mentioned in the studies, follows the same logic. However, instead of referring to the rules, a player with a professional attitude represents someone that agrees to act and acts as a military officer in the game.

As the term attitude is so strongly associated with the research in sociology, I have instead chosen to use player orientation in the last study and throughout this cover paper. The essence is still in what Suits means by his term lusory attitude, that is, acceptance of the principles of the game, but when this chapter and the papers in the Appendix are read
I hope it is clear I do not mean belief and feelings when the term *attitude* appears.

4.1 **STUDY I – GAMER MODE IS REVEALED**

As I earlier had witnessed some artefacts and unwanted symptoms in a staff-level course with wargaming, I decided to conduct a first exploratory study to find occurrences of gamer mode and to better understand what kinds of meaning-making processes could be identified. Besides finding occurrences of gamer mode, the study aimed to provide a richer picture of when and where gamer mode arises.

The study was performed on cadets playing an educational wargame to learn ground warfare tactics. Gamer mode can be seen by analysing choices made relative to the state of the game, the learning objectives, the context of the game use, and the teacher’s instructions. However, you only get clues as to when and where a choice is made in a wargame, and figuring out whether a player is more interested in winning the game than reaching the overall objectives is quite complicated. This is why a qualitative analysis was performed based on Jordan and Henderson’s (1995) principles of interaction analysis, as this gave me the tools to reveal associations between the participants’ actions and activities inside the game.

The game sessions were recorded using video cameras, audio recorders, and screen captures to enable interaction analysis of the material. After scanning, three sessions were selected for detailed analysis. The participants randomly manned each game station, but each participant was paired with a colleague from the same planning group. By transcribing comments that occurred during the game regarding what had happened between the players and what had happened on the screen, excerpts could then be classified and labelled as demonstrating instances of certain interaction. The labelling was done by the author and later validated through a video-review process conducted by two independent researchers and a military instructor.

Considering that gamer mode is manifested in various ways, I searched mainly for actions (moves) taken that were unrealistic vis-à-vis a real-world scenario and revealing utterances from the cadets explaining how they made sense of what they were currently pursuing, exposing a gamer mode orientation. It is a challenging task to determine whether players make a choice based only on their understanding of the game or on their
understanding of military tactics. Rather than over-interpreting actions, I went for a conservative analysis where I included only those incidents where there was a dialogue between the players that clearly revealed their reasoning. In my informal observations prior to the study I had noticed certain activities, specific to this game, that went against good practice in warfare. For instance those activities that clearly opposed the principles of ground warfare tactics and thus also the learning objectives, so I had some ideas about what to look for. I was, for example, interested in how the cadets treated the military units they were controlling. If players made moves or commented on the units according to the unit’s true representation, I categorised their orientation to be professional. However, if they treated the units only to their demonstrated effect in the game, I categorised players to be in gamer mode.

Besides treatment of military units, I searched for interaction and dialogue uncovering how game players made sense of the overall wargaming situation. I expected to find indicators for this in the final turns of the game session, as the game itself declared the winning side after the final turn. During analysis of the first session, I searched for different recurring interaction patterns that I grouped into separate categories. With these interaction patterns, I iteratively went through the other two sessions, either confirming or extending the categories. That is, I made use of a grounded theory approach to the material (Glaser & Strauss, 1967/1999).

**Results**

In the analysis of all game sessions, I found three distinct recurring interaction patterns and a fourth more unclear pattern. It was not particularly surprising with the fourth unclear pattern, because it is hard to continually determine what is going on during a game being played. Typically, the cadets made moves in this pattern without any reasoning aloud, or I could not distinguish a clever tactical move from a bad one.

The other three patterns were more distinct. In the first, the most common, cadets correctly based their strategy and argued according to what the theme was meant to represent. The actions were based on the cadets’ expertise of military units, and the tactics performed were in line with tactical regulations. I labelled the cadets in this pattern to have a *professional orientation* toward the wargame.
The second pattern is a normal effect of using a digital game that can only be a bleak copy of limited aspects of a realistic war situation. In this pattern, cadets were surprised, sometimes even annoyed or displeased, with battle outcomes, blaming the computer for being dumb and making invalid or faulty assessments of the activities in the game. Again, this often followed upon a game experience in which the cadets had exhibited a professional orientation towards the game.

The third pattern was the *gamer mode pattern*. Here, I found that the cadets acted on the game rules and either rejected or did not care what the military units in the game were meant to represent. In these cases, they made utterances and took actions that only could be explained by the idea that they treated the game as something other than what it was meant to represent – a gamer mode orientation. A typical behaviour was cadets drifting in and out of gamer mode, sometimes focusing on the mission and sometimes falling into the trap of trying to win at any price. Below is an excerpt from one of the sessions where Norman and Peter are discussing what to do about an incoming threat.

<table>
<thead>
<tr>
<th>1. Norman</th>
<th>Should we stand in their way here?</th>
<th>Indicating a move of a bridge engineering platoon toward a city.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Peter</td>
<td>No put it there...one notch up...just below the recon group (reconnaissance group)</td>
<td>Points at an unoccupied hexagon just south of recon group.</td>
</tr>
<tr>
<td>3. Norman</td>
<td>There?</td>
<td></td>
</tr>
<tr>
<td>4. Peter</td>
<td>Yes so they can’t reach any art bat (artillery battalion)</td>
<td></td>
</tr>
<tr>
<td>5. Norman</td>
<td>Should I pull these forward?</td>
<td>Indicating a move with a supply company. By moving this unit, a wall is formed together with the recon group and the bridge troop in front of</td>
</tr>
</tbody>
</table>
In this situation, the enemy have advanced deep into Norman and Peter’s units, posing a threat to an artillery company that could be attacked by an incoming mechanised infantry platoon. This is considered a serious threat, because under normal conditions artillery units operate far from the direct line of fire. Norman is handling the mouse, and Peter is giving instructions on what to do.

In this sequence, Norman in 5 suggests a tactical move that Peter interprets as very non-tactical or even foolish, as seen in his response in 6. The “wall” of units that would be formed by moving a supply company in line with the other units seems to be a valid military tactical move, if the supply company had fighting abilities. However, Peter clearly dismisses this tentative move (6), because it is a supply company representing a unit that has little or no combat ability. It is a supply company that is used for logistics and the well-being of other fighting units. Any move that exposes a supply company to direct fire is foolish and would strongly jeopardise the health and life of the entire supply unit in the long term. Peter understands this and treats the supply unit as a representation of a military supply unit. However, Norman treats the unit as a game unit. As such, the three units would form a wall and protect the artillery against incoming attacking forces. Norman’s tentative move can be justified only if we treat the military units as equal units in terms of attack and defence capabilities, similar to units with only symbolic representations found in abstract games, such as “Chess” or “Go.”
The interaction of Norman and Peter with the game and their disagreement on tactics can be seen as a clear example of two participants interpreting the game interaction differently, depending on their framework of reference – one is in gamer mode, and the other is upholding the game theme. Nothing in the game explicitly demonstrates the effects that a supply company has on other units, and thus, Norman treats this company as a generic fighting unit. He has thus shifted to a different framework of reference, where he attaches a different meaning to the supply unit than was intended. The example illustrates how complicated it is to determine what drives certain actions. For instance, Norman could have had an idea that this combat could only be won by sending the supply company to battle, and in some extreme cases this could also be true, but in this case the dialogue tells another story.

Although the cadets were instructed to approach the wargame seriously, that is, to make use of the military theories and tactics they had been taught before this game session, the results show that they did not always comply with this instruction. In the game, points were associated with certain regions in the map to indicate conquered terrain, which I believe correlated well with the military objectives. However, the cadets sometimes overused their resources and troops simply to collect those points. At a later stage, the overall military operation was to advance north, so preserving the resources was vital in planning the continuation of the operation.

This study suggests that gamer mode would be detrimental to the cadets’ learning processes. Cadets sometimes had different perspectives on what should be regarded as relevant to the situation at hand, showing their lack of understanding of the corresponding real-world possibilities and problems. Their way of speaking about the wargame and how they made moves in the game at times seemed badly informed with regard to proper military tactics, occasionally leading to disputes between the paired cadets.

Beside gamer mode, I found a reoccurring interaction pattern where the computer game was blamed for making faulty calculations. Players anticipated certain responses from the game that were in line with the players’ understanding of warfare, meaning players with good expertise of war expected and could evaluate the correctness of the game calculations, whereas players with less skill seemed to trust such calculations more. I noted that players’ expectations could be broken when the game’s
accuracy was not good enough. When that happened it posed a threat to players’ learning, as the activity became reduced to just playing a game and not an activity to enhance learners’ decision-making skills. Inspired by these observations I conducted a new study to reveal additional clues on what kind of influence unexpected game calculations have on the play behaviour and the learning process.

4.2 STUDY II - AN ENTRY POINT TO GAMER MODE

The purpose of the second study was to examine the consequences of those unexpected and faulty calculations in the game. I wanted to determine whether or not these calculations were beneficial to the players’ learning. I label unexpected game calculations to be events when the response from the computer game goes beyond what the player can predict as a plausible outcome. It is a relative definition of what can be seen as a faulty calculation, as it is determined by the players’ expectancies and beliefs. In these situations, the relation between the player’s knowledge of warfare and the game’s ability to mimic warfare is exposed.

Using a similar setup as in the previous study I let cadets play a commercial wargame to learn basic battalion combat tactics. The game sessions were recorded using video cameras, audio recorders, and screen captures to enable interaction analysis of the material. I searched for incidents where the calculated battle-outcome resulted in something that the user did not expect – those that were perceived as unlikely to occur. I was interested in whether I could credit the incidents as something valuable or as something harmful that could jeopardise learning. A qualitative analysis was carried out to explore how and why the incidents occurred, in addition to how the cadets made sense of and confronted these incidents.

The main problem in the analysis was to identify incidents of this mismatch, as many players silently played the game without any explicit response to the events in the game. Therefore, the incidents I selected involved players clearly reasoning around unexpected game calculations. From these incidents, I traced back and analysed earlier interaction to find clues to why the cadets were startled by such calculations. Where applicable, I also replayed the game turn to identify circumstances that led to the game coming up with such a result. In addition, the interaction
after the incident was analysed to discover specific behaviour or attitude changes among the players.

**Results**

Unexpected game calculations could be found in all analysed sessions, but they varied in many ways. They ranged from small events where players questioned the outcome from the game without any clear observable consequences, to important events where the game calculations changed the way the players behaved. An example of a small event was when group members discussed specific characteristics of a unit in the game and how this unit’s behaviour and properties were inconsistent with what they knew about them. Important events were less frequent: not more than three incidents were found among five analysed sessions. These events were categorised as important because they generated an intense discussion as well as an observable behaviour change among players.

![Image of a battlefield scene with a cadet and a computer monitor, with the text: It is a joke...this is a joke.](image-url)

**Figure 7.** The battalion artillery unit of this cadet has just been destroyed by a reconnaissance troop, which the cadet does not perceive to be realistic.
Two distinct different events were found among these. In the first event one team lost its artillery unit when the unit was attacked by a reconnaissance troop. Under normal circumstances, this attack would not result in the total destruction of the artillery unit. When this happened, the team cried out that the game was a joke and switched to a different playing style. Later on, during discussion, the team uttered their disappointment by saying “Well...it’s all because now in the end we are just playing for the points. It’s all so ridiculous. I got so upset after that defeat”. From this I interpret that the team, and especially one team member, lost faith in the game’s ability to illustrate warfare properly and switched to a playing style where he would win the game by points. He entered gamer mode because he could not see any reason to maintain a professional attitude towards the game.

In the second event, a similar surprising situation unfolds, but now with a completely different outcome. In this event, the team was making a poor assessment of the situation and decided to attack when they ought to have taken a more defensive stance. The attack resulted in nearly all their tanks being destroyed, with the enemy suffering only minor casualties. When I reloaded this attack in the game, I noted that the team suffered from an outlier in the game’s randomiser. Under normal conditions, the tanks would not suffer this amount of casualty, and this could have triggered the team to dismiss the reality of the game. However, the team maintained a professional orientation towards the game throughout the session and instead returned to this combat situation to find clues as to why it could happen. Without any instructor nearby who could assist in the reasoning they came to the conclusion that randomness in the game rules calculations, together with a bad judgment call on their part, resulted in the calculated battle-outcome.

Their valid conclusion exemplifies how learners through the game are able to critically challenge their understanding and beliefs of warfare in accordance to what Turkle calls “means of consciousness-raising” (1996). As a result, the outcome from the game can trigger players into challenging their knowledge and beliefs of warfare, without abandoning a professional attitude towards the activity. When this happens, even unexpected game calculations can be beneficial to the players’ learning, as they together explore the realism of the activity and assumptions that can safely be made, thereby reinforcing their understanding.
The results from this study suggest that unexpected calculations are to be minimised, as player attitude can be affected in a negative direction. However, unexpected calculations might also trigger a different user response, in which players start an inquiry process while remaining resigned to the game. Therefore, the study also proposes that these events can be valuable for learning, that even a flawed system can be beneficial for learning. However, to make that a more likely course of events, the instructor has an important role in reinforcing the importance of playing the game as if it were real.

From this study I saw how important the game’s inner logic is to the players. Inspired by this I turned to the game features to study what players actually do in the wargame. I specifically wanted to understand what impact game features, such as reward structures, have on the players’ behaviour, and whether I could finds signs of gamer mode when manipulating the game design.

4.3 Study III – Measuring effects on the battlefield

In this study I manipulated the conditions of the wargame. I did not want to manipulate the conditions to such an extent that the cadets’ learning experience would be compromised, which would jeopardise the ecological validity of the educational setting. Therefore I chose, in dialogue with the teachers, to only slightly change the conditions in the game design. Games in general are provided with reward structures to respond back to the user what user action is considered good and what is not. Reward structure is thus an important feature that helps create meaning for the player (Salen & Zimmerman, 2004). As we saw in the first study, however, there is a risk that what is rewarded by the game can affect players into unwanted playing styles. In an undergraduate course to learn battalion combat we wanted to investigate this influence. By adding explicit game goals, still in line with the mission objective, I wanted to investigate what effect this feature change had on how the operations was conducted, that is, what tactics were employed. Specifically I wanted to see if I could affect the tactics employed and thereby see an overtly manifested, exaggerated, rule-focused interaction.

Method
The study was performed on the same data set as the second study, in which I found occurrences of gamer mode. This time, however, I used a
quantitative research method with between-subjects design. The independent variable was the explicit reward structure in the game, that is, if the game is played with or without victory points.

For the experimental group, certain regions in the game map were associated with victory points, which meant that a score was awarded to the side that possessed the region. The control group played without getting any points. As the computer game normally used scoring to keep track of which side was winning, the removal of victory points meant that the game could not tell players who won.

One way to analyse the tactics is to observe how the players make use of the military units, especially the players' choice to maintain their units' strength, readiness, and health. Health in the game is a result of how much the unit has been engaged in combat, subjected to indirect fire, being moved, or provided supplies. A low value thus means that the unit has been utilised extensively, and this can be a sign of a lusory orientation towards the game for two reasons.

First, players with a lusory orientation adopt a strategy that makes use of all resources available to achieve the game goals. In educational wargaming this strategy is not always desirable. Support units (engineers, headquarter, artillery, medical, and logistics units), for instance, are normally not used for combat tasks, but the player may use them for offensive tasks to reach the game goals. Such tactic will decrease the health value on support units, and measuring the health value will help reveal whether players are keen on reaching game goals by all means.

Second, the cadets' wargame only allowed for a small part of a larger military operation, and according to instruction they must take this into account when planning and conducting operations. A risky tactic is to exhaust units within the time allotted, possibly only to fulfil the game goals for wargame, but neglecting that the units are to take part in the next stage of the operations. This is also stated in military doctrinal rules that emphasise the importance of sustainability, which means that forces are to maintain combat readiness over time. Consequently, the military units' state at the end of a game session, especially the units' health value, will mirror the players' ability to address sustainability issues and how keen the players follow those doctrinal rules.
Results
After the game session had ended every unit was measured and given a point corresponding to its current health status. Subsequently a mean value was calculated for each side. As I was interested in how each team made use of support units, a separate mean value including only engineers, headquarter, artillery, medical, and logistics units was calculated. To avoid dependencies between each competing side a mean value was calculated for each match, including both red and blue sides. Additionally, as the same participants were included in all three game rounds, separate analyses were performed for each game round.

Results from an independent two-sample t-test showed no significant differences between playing with points or not for the two first rounds but a significant difference in the third round. Calculation of the effect size yielded a large effect size for all rounds. This means that even though there was no significant difference in the first and second rounds there was an effect of health decrease in all rounds when playing with points. When support units were compared there was a significantly lower health score in matches played with points compared with those played without points. This was true for all three game rounds, and the effect size was also large in all rounds.
When support units were compared there was a significantly lower health score in matches played with points compared with those played without points. This was true for all three game rounds, and the effect size was also large in all rounds.

In summary, all game rounds played with victory points had on average a lower health status of the units compared with groups playing without victory points. Playing with points had a negative influence on all military units’ strength and capabilities, which indicates that players expose the units to risks such as attack and move orders. This is
particularly true for support units, which suggests that players employ a tactic that is not in line with doctrinal rules.

In my study the reward structures in the game lead to significantly lower unit health mean values, which is evidence that different tactics were employed as compared with matches in which no reward structures were used. One explanation for the extensive use is that players with reward structures act more aggressively and therefore utilise their units to a larger extent. Moreover, as the support units yielded low unit health values, the results indicate that players with reward structures did not differentiate between combat and support units. This confirms results from earlier studies that players, carried away by the gaming, repress the symbolic representation of support units and use them as fighting units.

Because players in these cases do not prioritise unit rest, recovery, and strength, the results can be interpreted that the players are oriented towards achieving the game goals by being more aggressive. They employ a tactic in which they are willing to pay a much higher price to achieve their goals. Whether this is desirable or not depends on each individual situation; there are occasions where achieving a small victory matters more for the overall military operation, and in those situations the commander is expected to take more risks. With these results, however, where we could see a broad and widespread difference between the matches in the two conditions, I conclude that victory points made players have a more lusory orientation toward the game. A remedy to this problem is to eliminate victory points for wargames or redesign the game so that unit health value will influence the score. However, the main point was not to find an optimal wargame. Rather, it was to show how sensitive play behaviour is to certain design elements, especially when this design element is the reward structure, which is a fundamental attribute to games. Furthermore, a redesign changes the game into something else where different play behaviour is encouraged – possibly creating other unwanted consequences. In the next chapter I will come back to and discuss whether redesigning the game is the best strategy to prevent unwanted play behaviour.

The results indicate that playing with victory points makes players fall into gamer mode, even if not proven but only suggested through the quantitative data analysis. Furthermore, one can debate why I did not choose to find correlations between the quantitative and qualitative analyses, that is, attempt to find a connection between low unit health
values and playing in gamer mode. Although I found occurrences of gamer mode in the data set in a previous study, I did not perform any analysis on how much and how many times players fell into gamer mode. This requires, above all, an operationalisation of gamer mode – and the question is whether it lends itself to be quantified. There are some fundamental problems with this, which I will come back to below. In my view, we should understand this study as an analysis of a variable (unit health value) *that arguably should be influenced by gamer mode*, and how this variable changed as a result of playing with victory points.

The studies so far have shown that there is problem with the competition aspect in wargaming that results in players falling into gamer mode. One reason they fall into gamer mode is the games’ failure or lack of ability to live up to the players’ expectations. However, the fundamental design of games, that is, reward structures such as victory points, is enough to make players switch to an unwanted playing behaviour, in which they most likely focus too much on winning the game as such.

As noted in the Method chapter, educational wargaming within the Swedish National Defence College is not performed unsupervised. The didactic setting mandates instructors to oversee and support learners’ wargaming. In papers I to III I argued that an informed instructor can manage problems with gamer mode and unwanted player behaviour. To properly investigate this, my last study centred around the instructor’s role.

4.4 **STUDY IV – THE INSTRUCTOR ROLE IN WARGAMING**

The fourth study focused on the instructor’s role during game play and how the instructor handles and supports the desired player-orientation towards the game. This was done by re-examining videotapes from studies I to III, together with an analysis of the literature on game-based learning in general. I searched for interaction between instructor and the cadets that provided insight on how the instructor dealt with issues that emerged and how the instructor supported the cadets’ gaming and learning. To further my understanding of the situation and figure out what the instructor duties are, I used interaction analysis of the video material. Although interaction analysis is time-consuming, the search and analysis phase was simplified as I could omit interaction that had no instructor concern.
Managing gaming
A challenging game environment can generate excessive competitiveness where the players focus solely on performance and not what could be learned from the gaming (Harviainen, Lainema, & Saarinen, 2012). From an educational perspective, however, performance is not as important compared with what is learned from the games. As lessons are learned from both success and failure, it is essential to have the instructor nearby to constantly remind players of this chief educational purpose. In the videotape I found a specific moment where this was made clear. Just after one of the wargame sessions had finished and the cadets were waiting for the instructor to facilitate debriefing, one team argued with fellow cadets on who had won the game they just played. There was a big argument whether the computer was correct in declaring the opponent team as winners. According to them the opponent team just tried to get as many point as possible at the end of the session while neglecting the strength and health of their units. As this is a symptom of gamer mode, it was interesting to see how the other team reacted to this. Apparently, winning mattered to both the teams, but there was confusion as to who won – the one with highest computer points or the one with least casualties? This could have been resolved if an instructor had been nearby. Surprisingly, this confusion was not brought up for discussion by anyone when the instructor arrived and started the debriefing. If an instructor had been present or made aware of the discussion, the instructor could have reminded the cadets of the educational objectives and the difference between winning by points and maintaining a sound decision-making process.

Wargaming mandates more than just playing a game. Participants play as if they were commanding real units, and can and should be supported by the instructor as the excerpt below exemplifies. In this situation the instructor acted as an in-game commander to the team. Although he role-played as the commander, he swiftly shifted between a game frame and a real-world frame as he explained time periods.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ron Major, request to scout south of the battalion border. To place a</td>
</tr>
</tbody>
</table>
In the excerpt, the team (through Ron) uttered a suspicion that the enemy might surprise them in an attack from the south. They wanted to scout in that area so they would have time to respond to that threat. This area, however, is beyond their battalion border, so they asked for permission from the instructor, who instantly adopted the role of their commander as seen in (2). This commander’s role is clear in (8), where permission was

<table>
<thead>
<tr>
<th>2.</th>
<th>Instructor</th>
<th>Where?</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Ron</td>
<td>Down here to have eyes on....</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Circle their mouse pointer on an area south of their battalion border</td>
</tr>
<tr>
<td>4.</td>
<td>Instructor</td>
<td>Somewhere around map mark 105.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>South of it</td>
</tr>
<tr>
<td></td>
<td></td>
<td>105 is a point on the map</td>
</tr>
<tr>
<td>5.</td>
<td>Luke</td>
<td>Yes, to stop the enemy to surprise us in the back.</td>
</tr>
<tr>
<td>6.</td>
<td>Instructor</td>
<td>You don’t want them in 107 then?</td>
</tr>
<tr>
<td>7.</td>
<td>Luke</td>
<td>Erhmm, we could....</td>
</tr>
<tr>
<td>8.</td>
<td>Instructor</td>
<td>There is a problem to get access to reconnaissance from the brigade. So you are welcome to send your battalion reconnaissance forward along 107, but then we want reports from that area directly to the brigade staff. Within 12 hours.</td>
</tr>
<tr>
<td>9</td>
<td>Ron</td>
<td>Acknowledged</td>
</tr>
<tr>
<td>10.</td>
<td>Luke</td>
<td>That is three turns?</td>
</tr>
<tr>
<td>11.</td>
<td>Instructor</td>
<td>It’s two</td>
</tr>
<tr>
<td>12.</td>
<td>Luke</td>
<td>Two turns, then we’ll do it.</td>
</tr>
<tr>
<td>13.</td>
<td>Instructor</td>
<td>What turn are you playing right now?</td>
</tr>
<tr>
<td>15.</td>
<td>Instructor</td>
<td>OK, so in turn four you must be ready to leave that area.</td>
</tr>
</tbody>
</table>
granted and explained in terms what was going on at higher command. The higher command was not played in the game in other ways than in this spontaneous response from the instructor. The instructor also mentioned the time period in real units (hours) and not how time is represented in the game (turns). This stirred some confusion to Luke, seen in (10), so he asked the instructor what 12 hours actually meant in the game. The instructor then translates 12 hours into the time represented in the game; in other words, he framed time differently. To make sure they understood, the instructor also told the cadets in what turn they must leave the area.

I argue that the instructor should be taking an active part in the game process by framing the activity. The instructor should remind players that it is a game they are playing where there is a difference between performance and learning. Instructors should also support the players’ role-play and their professional orientation to the game activity. To be able to frame the activity, the instructor needs to have wargaming experience. The instructor needs to know wargaming in all its qualities, difficulties, and abnormalities; otherwise, it is hard to frame the gaming situation with the learning objectives in mind.

Managing learning

As players are expected to learn from the game experience the instructor needs to follow the gaming process in detail and be given the authority to intervene to support the players’ learning when needed. Earlier studies have shown that players accept the outcomes of the game without challenging the underlying assumption, or worse, assume a different meaning to what happened on the screen without any real-world relevance (see paper I).

An instructor can prevent this by explaining events in the game by providing real-world references. This is an important responsibility, and if properly conducted it can support the cadets’ reasoning and their learning processes of warfare. The other side of this issue is that instructors must contribute to uphold the games’ ability to be a legitimate illustration of warfare. The instructor should have the authority over the gaming process, where he or she is given opportunities to steer the learning process and challenge the players’ beliefs and assumptions, mainly to uphold the link between the game and the real world and assist in the players’ meaning-making processes.
Based on these findings, I argue that instructors have an active and central role during game play to help shape the activity and to manage issues like gamer mode when they emerge. In line with this argument I question game-based learning approaches where players are left on their own during game play. I argue that this holds even for situations where the players possess enough knowledge of the subject matter, and believe they are in no need of facilitation to play the learning game. Gaming is such an engaging and motivating activity that calls for an objective instructor who can constantly remind players of the learning objective and the reasons to play the game.

Furthermore, the time spent in game play serves as a huge resource of learning opportunities where situations that emerge can and should be discussed afterwards during debriefing. Regardless of player expertise on the subject matter, they are probably too much into the game that they cannot see lessons learned from these situations when they happen. In addition, they may be enticed to win the game that they lose sight of the reality aspect to the actions they are performing. This calls for the instructor to observe and intervene during game play as well as collect material for discussions afterwards.
5 DISCUSSIONS ON RESULTS

The studies have illuminated some of the trigger factors and observable consequences of gamer mode in educational wargaming. In this chapter I will provide an in-depth discussion on two topics based on the results and empirical work I gathered. First I will turn to the game design and respond to and challenge the idea that wargames need to provide a realistic model of reality and that the solution to gamer mode is just a matter of changing the design of the game. Then I turn to the learning and will analyse what the results suggest to learning with wargames.

5.1 RE-DESIGNING IS NOT THE SOLUTION

The results from the four studies point to several different reasons why players may enter gamer mode. One of these reasons is the game design itself. Oftentimes, problems in learning environments will direct attention to the game design as if elimination of flaws in the design, for instance by including more accuracy or realism, would provide the magical weapon against bad learning environments. Although the results from my studies partly support this, I argue that problems like gamer mode will never be entirely eliminated through providing better design. My argument is based on two prerequisites; that the wargame is a model and a game.

The wargame is a model

The first reason why we need to question striving for extreme realism in games is because all wargames have to simplify some aspects of warfare as they have limited resources at hand. It is up to the game designer to select which aspects are essential and deserve special attention.

Normally the design is made with the learning purpose in mind, meaning that the objectives guide the creation process when choosing what aspects are to be included. A naïve approach in the design process is to model warfare as accurately as possible, perhaps aiming at creating a complete model of war, in which as many details as possible are included in the model. Given that a model is only a useful approximation of reality, it is neither desirable nor possible to include all factors of war as long as it is model is theoretically relevant (Brehmer, 2004). Designers thus need
to choose wisely which factors are more important than others. As educational wargaming is used for exercising decision-making, the game design must focus on those aspects that are needed to make decisions, while minimising the effect from irrelevant factors (Perla, 1990). Furthermore, in line with the naïve approach, is also the assumption that the selected factors need to be in high fidelity, meaning they are as accurate as possible with the anticipation this will automatically lead to better learning. However, this assumption is not supported by studies on simulator fidelity (Alexander, Brunyé, Sidman, & Weil, 2005; Salas, Bowers, & Rhodenizer, 1998). Such studies conclude that it is not the level of fidelity that decides learning worth but how well the model captures the critical elements needed for teaching the skills.

An example on how a game manages to capture the critical elements for commanding naval warfare can be found in the game Simple Surface warfare Model, SSM (Waldenström, 2012). In this naval wargame the designer successfully managed to capture the key elements in decision making that mimic the situation of a fleet commander (Lif, Frank & Lundin, 2011). Not all details, but enough elements to deliver challenges that a fleet commander is typically faced with, such as how to best make use of his or her own naval forces and to understand what the enemy is up to, are imitated. Perla (1990) also argues along this line, indicating that the game designer must help players suspend their disbelief and through the game mechanic provide enough information for players to be able to make decisions and see the outcome of these decisions. Brehmer (2004) argues on the relation between microworld (i.e. the wargame) and the situation outside the game situation. He criticizes the notion that the microworld needs to be a smaller version of the ‘real world’. Resemblance is not the key issue Brehmer states, instead the microworld needs to be designed guided by a theory. A theory of warfare that informs the designer which variables to look for and in what ways they should be operationalized (Brehmer, 2004).

As a result, no wargame will ever include all aspects of war. Instead the game mirrors some aspects of warfare. Neither is perfect mirroring needed. As long as the critical and theoretically relevant elements are included in the design the game will be useful for learning purposes. However, designing the game is no easy task. “The difficulty for the game designer was to put together a system that could translate the details and processes of reality into game mechanics while preserving the
players’ focus on reality” (Perla, 1990). If we accept that the representation of reality is less than perfect, we also must agree that players may perform actions that fit the game but are not applicable in reality.

Another angle on the same problem is what is perceived as accurate in the games. As noted in the first and second studies, players have different prior expertise of the subject matter, and this influences their expectations of the game, which in the long run also has an effect on the players’ orientation toward the gaming situation. Although I argue that redesigning the game will not eliminate the problem with players falling into gamer mode, I imagine there is a level of accuracy for each individual player where they perceive the game to be realistic. This level is not fixed, but depends on the player’s pre-existing knowledge of warfare.

The wargame is a game

The second reason game design is not the single answer for eliminating gamer mode involves the gaming aspect. In the third study I compared player behaviour when playing with or without victory points, which resulted in a difference in the tactics employed. It is necessary to understand that the victory conditions in this experiment were designed with the military objective in mind. The objective for all groups was to capture and hold vital regions on the map, so for the groups playing with victory points I modified the map, assigning points to those regions that were crucial to the military objective at hand. With this, I assured that both the experimental and the control groups would strive towards the same objective. I was interested in whether the cadets would play the game differently when points in the game were introduced. The results showed that reward structures made players adopt a different play behaviour, indicative of their being in gamer mode. It also showed that even if they won the battle, those cadets playing with points more often failed to cater to the health status of their units. As noted in the study and further elaborated here, this is interesting from a design perspective.

First of all, an immediate response to a change of play behaviour is to reward that behaviour that is in line with the learning objective. In my third study I saw that players did not care about the health status when striving to gain points. A quick fix would be to include that element in the reward structure so that a higher health status among units would yield more victory points. Although I haven’t done any experiment to verify
whether this is true, I argue that redesign of this kind can easily become an infinite process with a never-ending list of new problems to solve through re-design. I can imagine that unit health value will not be different between the two conditions if health status is part of the scoring system. However, what the third study demonstrates is that a game design with explicit reward systems (rather than ambiguous winning conditions) such as points will generate a play behaviour not anticipated. This play behaviour suggests that reward structures and scores matters to the players, the rewards produce a special meaning to players.

A fundamental design principle in game creation is to build a game system that enables a meaningful play for its players (Salen & Zimmerman, 2004). According to Salen and Zimmerman, every game lets players take actions that the game responds to. These responses will tell whether the players’ actions are successful or not, that is, if the action takes the player closer to the goal. From this cycle of player action and system outcome meaningful play is created. Linderoth showed that this cycle does not need to originate from the game theme (Linderoth, 2004). The meaning from an object in the game can instead be defined through function the object has in the game regardless of what the object is meant to represent.

The reward structures in our experiment suggested that the reward model makes players strive toward the game’s victory condition. This is generally not problematic, as certain vital regions in the game yielded rewards. However, we did not want the players to abandon their meaningful play from the warfare. The game and its reward structure was not the single element we wanted to shape player interaction. We also wanted meaningful play to emerge from a military operations perspective, and when studying the battlefield after the game we could see that this was not the case. The groups playing with points had military troops in dreadful shape, which indicate that they did not care for the troops’ health or well-being as long as they conquered the regions that yielded victory points. In terms of meaningful play, the interpretation could be that their meaning was created only from a game as a closed system. The explicit reward structure lured players to apply a game-system-specific meaning to their actions, which is entirely uncalled for from a learning perspective.

The question is whether elimination of reward structures in the game would be enough to solve the problem. I argue that it is not, as wargaming
is after all a competition. It may be the case that elimination of victory conditions in the game design will help players avoid attaching meaning only from within the game itself, but wargaming is still a challenge and a competition against an opponent. Willingness to overcome the opponent may lure players to use all means available, not in a way where they break the rules or cheat, but instead abandon the focus on reality and use the rules in unanticipated ways. A cunning player who is fully aware of the features may be tempted to use the model creatively, as in the example in the Introduction of this thesis. That excerpt was taken from a wargaming session at our school, and in that I witnessed how a player issued an order to fire missiles from a sinking ship. A ship normally has no capability to fire missiles or any other offensive manoeuvre when it is about to sink to the bottom of the sea. However, through this flaw in the design, it was allowed by the game, and the player took advantage of this flaw. Changing the attributes of the ship may be a quick fix to stop future misuse, but the event exemplifies how vulnerable the models are to exploits, and what seems to be an error in one sense is quite meaningful in the context of the competition.

5.2 CHANGING THE CONDITIONS FOR LEARNING

Although I have not made any effort to assess or measure learning in wargaming in this thesis I see my results as contributing to the game-based learning field. In the Background, I argued that the learning in wargaming could be explained through socio-cultural and situated learning theories. I will now return to these arguments and explain what my results suggest to such a position.

Central to both the sociocultural and situated perspective is the focus on social practices and how knowledge is situated and tied to the activities in those practices. What I have found throughout my studies is that the gaming activity changes the conditions for learning. I have found problems with what the learners are being able to learn – the gaming aspect in the wargaming activity is not a transparent apparatus to learning of the subject. A premise is that games lend themselves to be used to learn about warfare since many elements required to play a game is also represented in warfare. However, this relation between games and warfare also needs to be cautioned as the gaming activity risks becoming its own learning subject.
In normal conditions, the wargaming activity should portray the decision making situations in warfare in a transparent manner where the players are involved and participate in military dilemmas, tasks and challenges. Yet what my results suggest is that the gaming becomes a content in itself, blurring, overshadowing and shaping players behavior into something that was not intended from the learning perspective. And gamer mode is the symptom of this situation as the players are focusing solely on the competition element in warfare while neglecting the other facets of war.

By this I argue that the condition for learning is flawed since the activity in itself is not what the instructor intended, meaning that the gaming activity has changed the conditions for learning. A re-design of the wargame will help in eliminating the emergence of gamer mode, however, changing the design is not sufficient to change the conditions of the activity. With support from the study IV I see the instructor as able to change the way players play the wargame, meaning the instructor can renegotiate the player interaction with the game. The instructor has the ability to reframe the activity in ways where the wargaming does not become reduced to a sporting event but remains as an activity where proper military decisions (in respect to the learning objective) are being made.
6 CONCLUSIONS AND DISCUSSION

Let us return to the questions posed at the beginning of this thesis. The overall aim was to document and subsequently try, through a video-based interaction analysis, to understand how participants in a wargaming situation act out the tension between the represented situation and the game. With an extended view of how participants act out the tension my aim was to probe and answer the following questions:

- Are some interactions more fruitful to learning? Or detrimental to the learning process? In particular, does gamer mode lead to impoverished learning?
- What triggers different players to change focus and orientation towards the game i.e. entering gamer mode?
- Is it possible to influence or control learners’ stance towards this tension by designing the game differently?
- Is it possible to influence or control learners’ stance towards this tension by changing the instructions given by the teacher?

6.1 CONTRIBUTIONS

This thesis investigates issues that arise when games are used in military education to learn tactics. Games are rule-governed systems that define what is possible to do. However, they are also representations that make use of fiction or portray a theme where the game is set. Players may focus on either of these or on both during game play. The specific focus of this thesis is to understand what the dual nature of games means for military wargaming.

I studied the interaction between the player and the game in wargaming sessions. The results confirm that there is a tension between having a rule-focused interaction and a theme-oriented interaction. There are occasions in which players are mainly using the rules, concerned with winning the wargame and disregarding the theme and the learning objective. A symptom of this is when the cadets in my study treat the military units only as game pieces, that is, only to their function in the game and not also what they are meant to represent. With this orientation it is perfectly reasonable to attack with a support unit or headquarter to gain game points, as this is possible in the game, although
this action is not advisable from a military perspective, especially when we consider what the cadets are supposed to learn. With this orientation it is logical to creatively find exploits in the game system to be declared the winner in the end. Those situations I refer to as being in gamer mode: Players in gamer mode have an extreme rule-focused interaction, meaning they behave rationally with respect to game rules but irrationally with respect to the portrayed real-life situation. Therefore, I argue that gamer mode is problematic from an educational perspective. The wargame becomes de-contextualised, and the player suppresses the requirement to think and act as a member of the military profession and instead focuses solely on using the rules to achieve the game goals, which confirms observations from Rieber and Noah (2008), who saw students become obsessed with improving their score when they used a game-context simulation.

Based on what wargaming is, that is, a gaming activity where participants are supposed to make decisions as if the situation were for real, I conclude that players need to adopt two simultaneous orientations toward the activity. With a ludory orientation, players need to understand and agree upon playing the game according to the rules. This implies that the only permitted actions are those manifested through the rules. All other actions are irrelevant, as they are not supported by the wargame. With a professional orientation towards the activity comes the other requirement: players are assumed to play as if the weapons and forces they are controlling were real (McHugh, 1966/2011). Wargaming is an exercise in decision making, and we expect the players to learn from their experiences. Assuming this role is thus important to not lose connection to what the fiction is meant to represent.

Gamer mode can probably occur for many reasons, and this thesis has documented two contributing factors. The first concern is when the game does not match the players’ expectation on mimicking warfare. In these situations a player perceives that the game breaks the fragile contract of upholding an accurate representation of warfare. This can direct players away from reality and make them abandon a professional orientation toward the game in favour of overcoming the opponent by other means. A cadet from study II, who lost his battalion artillery to a reconnaissance troop, became so upset that he quit playing the game as required. Instead he chose to switch to a tactic where he only went after points and where he did not bother with any role-playing aspect. However, when the game


behaves in unexpected and unrealistic ways, it may also become beneficial to learning if the players critically challenge their beliefs as well as the underlying assumptions of how warfare is represented in the game. Flaws in the game system can thus be beneficial to the learning process – but only if the players engage in a critical and fruitful dialogue of what happened.

The other factor that may lead to gamer mode is the game design as such. The objective *within the game* is defined and designed by its creators and a common way to create in-game goals is to make use of explicit reward structures or victory conditions. These are problematic, however, from an educational perspective, as they can influence player behaviour in unwanted directions. Although the victory conditions are perfectly in line with the military objectives, they may shape players’ behaviour into adopting a strategy other than intended. In study III I measured a difference in the strength and health value of the units when explicit reward structures were used. This strategy, to exhaust units in combat and manoeuvring, suggests that the players are more interested in fulfilling the game goals than in controlling the military units as they should, which in turn indicates that the players are in gamer mode. In this sense, the game design can be changed to limit the emergence of gamer mode.

Altering the design, however, is not the magical weapon against the likelihood of gamer mode. Explicit game goals, such as victory points, can easily be designed in ways where they mirror the military objective or the design can be changed so the game has no scoring system. Yet these modifications will not be sufficient, wargaming is still an activity that is performed against opponents, that is, there is an inherent element of competition in the activity. This may lure players into overcoming their opponents by any means possible – whether they get points for it or not. And as the games make use of models, i.e., abstractions and simplifications of real military units, the players may be tempted to exploit weaknesses in the game models to their own benefit.

Instead there is a need to deal with gamer mode by other means. The time allotted to gaming is usually limited, and the wargames are seldom played repeatedly. This means it is better to deal with gamer mode as it unfolds in real time instead of waiting until the debriefing discussion after the game is finished. When analysing the role of the instructor in the last study I could observe a spontaneous role-play from the instructor to
support framing the gaming activity. An instructor who actively supports the cadets’ professional orientation in this way can prevent gamer mode from occurring. This can also be done by constantly reminding players of what is important in the situation at hand. This requires the instructor to take an active part in the gaming process (Alklind Taylor, 2014) and have the skills, knowledge, and authority to intervene in the students’ game play. In the last study I could see what happened when an instructor was not nearby to resolve an argument between the cadets on which side had won the wargame they just played. The instructor should remind these players of the educational objectives and the difference between winning by points and maintaining a sound decision-making process. However, the instructor should also be present and support the cadets’ reasoning and intervene before such a point-hunting tactic is considered.

Taking all the studies together, a picture emerges exposing the ways by which gaming influence learning in a wargaming practice. Gaming is not a transparent apparatus to learn a subject. Instead, the gaming activity risks becoming its own learning object, blurring, overshadowing and shaping players’ behavior in unwanted directions compared to the learning objective. In this way the condition for learning becomes flawed, as the gaming activity changes what is being learnt. However, wargaming is a social practice with discourse, cultural norms and distinct human activities upholding this practice. Through interaction, negotiation and collaboration between elements in this practice (including learners, game and instructors) the activity can be re-negotiated. This means that the instructor who facilitates the game process has the ability to frame the activities differently through dialogue and re-negotiation with learners. The instructor can at appropriate time re-frame the gaming activity to assure that the relation to the officer profession is maintained.

6.2 Contextualising the results

Both Caillois (1961) and Gredler (1996) argue that games that are competitive and games that are role-played should be seen as separate categories. However, wargaming includes both these qualities; it is an activity that is a mix of both *agon* and *mimicry*. A direct consequence of adopting both a professional orientation and a lusory orientation toward the wargame is that a player follows the rules and at the same time plays *as if* he or she were a commander. We need the activity to be shaped by
both orientations. In this sense wargaming confirms arguments by Juul (2005) in that the relation between fiction and rules matters to the player.

My results support Juul in the sense that they explain what is expected from the players. When players in my studies reason and perform actions based on what the military units on the screen represent and at the same time are willing to accept the boundaries established by the rules, the players show a balanced lusory and professional orientation toward the game. The warning from Gredler (1996) of mixing experiential simulations, where players assume roles with games, a competitive exercise, is another view on what happens when a player enters gamer mode. Based on my findings I have come up with a diagram (see Figure 9) that outlines what options a player has in a wargaming situation and that positions gamer mode in relation to these options.

![Diagram](https://via.placeholder.com/150)

Figure 9. A simplified illustration of the actions a player makes in a wargame. Actions are either permitted by the game (blue circle), rational to military tactics (green circle), or a mix of them (intersection). A special case is when players in gamer mode perform actions to achieve game goals at the expense of the realism in this action (red circle).
This is of course a simplified view of how humans make decisions, but the diagram serves the purpose of visualising that different resources control and influence an action. If we see all options that a player can do as circles, then a first circle (in blue) describes what is possible to do in the wargame. This is necessarily not the same as the circle in green, which marks all options that can be done according to military tactics. Perhaps this green circle should be enormous, as tactics could mean almost any action, but for this purpose it is enough to understand that it as something broader than what the game can embody. And as the wargame in our case is used for educational purposes, the green circle describes the actions teachers and instructors want the students to perform.

The wargame mirrors reality, as argued before, and through this simplification there will be actions taken from reality that will be impossible to do in the game if these are not included in the models (represented by the green half-moon segment in the figure). These actions become irrelevant in the situation at hand, because the game cannot carry out these orders. The blue half-moon segment, on the other hand, represents actions that are permitted by the game but are ruled out as irrational with the respect to the corresponding real-life situation. These actions are, for instance, when a player just randomly performs actions with no tactical idea behind. A special case of actions in this segment is when players exclusively try to achieve the game goals, for instance, by using exploits in the game, which we define as being in gamer mode (red circle), in which players no longer care for or are concerned with the learning objective. Players should ideally reason on events and make judgments based upon both the real world and what is possible to do in the game, which is represented by the cross-section of the circles.

Players’ dismissal of the representation confirms studies on gameplay made by Linderoth (2004) and the observations by Rieber and Noah (2004). I found instances where the theme of the game became suppressed only because the rules created a self-sufficient meaning. If the game’s representation is vital for learning, then suppressing this will have a negative influence on the value of the learning.

These results send a message to all situations where games are used for purposes other than for entertainment. Now and then the media report on games or gaming activities being good for ‘serious uses’. The designers of these activities need to be aware of the power of a rule-focused
interaction and that people may enter gamer mode. Players will probably enjoy these gaming activities, but the question is whether such gaming activities are done at the expense of the overall purpose.

I became witness to this kind of behaviour in a company-wide health game session. The objective was to increase employee health in our organisation, and for a month all employees were invited to participate in a walking contest. This was for the main part a good idea, because many employees became more active and started exercising on a daily basis. However, some fellow colleagues focused solely on the competition aspect of the activity and started to walk obsessively. They became so obsessed with increasing their ranking score that they actually hurt themselves in the end. They never cheated, but their eagerness to win shaped their behaviour to the extent that their health status actually decreased, which ironically was the opposite of the game’s overall intention.

6.3 IMPLICATIONS OF THE RESULTS ON THE WARGAMING PRACTICE

The results from my studies contribute to the educational wargaming practice in a number of ways, which I have chosen to divide into direct and indirect contributions. I see the awareness of gamer mode as the main direct contribution. Similar concepts can be found in the wargaming literature, for instance by Rubel (2006), who mentions that players seem to be more aggressive in wargaming than in real life. Perla (1990) states that the models flawed nature will enable some players to ‘game the game’ and make use of exploits to overcome opponents. My contribution to these texts is to confirm the existence and coin a term for it. I also shed light on some of the reasons for this player behaviour and what the consequences can be. With a better awareness by the instructor and the players comes probably an incentive to manage gamer mode. Although I have focused on the instructor and somewhat on the design to manage gamer mode, there are probably many other ways to manage and better contextualise the activity for learning purposes.

Games with explicit reward systems, such as victory points, are problematic, as they may lure players to adopt a different strategy than intended. Commercial games are often designed in this way, which means that educators need to be aware of some of the consequences of using these game titles in military education. Although not this specific, in essence this is what Lind (1985) warns about when he argues that
computer games are “worse than useless” when used to decide to who wins a game. A commercial computer game may provide an appealing low-cost alternative to expensive computer simulations but could generate more problems than value. I do not argue, however, that commercial games are useless and issue warnings of using them for military purposes. Instead, such games need to be modified so apparent misuse can be eliminated. Or at least they should be controlled by instructors during game play so that players do not fall into gamer mode.

Gamer mode should not be confused by the discussion on game realism. As I have shown in the second study, there is still room for flawed systems or games that have a low level of accurate representation of warfare. When players are faced with events that occur unexpectedly, they critically challenge their assumptions of warfare, which in turn can be transformed into small ‘learning gems’ to further the players’ understanding of ground warfare and the tactical principles. Wargames are only bleak copies of war, and true realism is unattainable, which means the accuracy must be examined in relation to the learners’ level of expertise and to the educational objective. I can imagine that the more knowledge the player possesses, the more accurate the wargame needs to be. Not in the sense that less accurate games illustrate an untrue image of warfare, as a wargame with strong simplification can still illustrate war as we perceive it. I believe, however, that with more user knowledge of warfare the fidelity of the models in the game needs to be higher. Again, this perceived realism is a contributing factor to uphold the players’ professional orientation toward the activity. Even though this relation between the learner and wargame will stipulate the requirement of the design, I argue that even a seemingly flawed game system has a learning potential – if placed in a proper context, with a proper instructor that is able to direct the play.

Another contribution from my studies is how the wargaming practice depends on the instructor. The instructor can control the gaming situation and steer the learning process into desired directions. Although the literature is rich in claims on the importance of debriefing afterwards (Crookall, 2010; Lederman, 1992), and I agree with this position, I would like to add that it is important to have instructors nearby to aid and assist players’ wargaming while playing. From my studies (see paper IV) I could see how the instructor managed to explain events that just occurred on the screen and by this correct the players’ assumptions of warfare. The
instructor in this case explained that the reason why the cadets did not succeed in their attack was because the enemy was fortified and well prepared for an incoming enemy attack. The instructor even mentioned what weapons were used by the defending forces, something that was not included in the game but served the purpose to further the cadets’ understanding of army tactics and equipment. My arguments on the instructor role concur with those of Alklind Taylor (2014) who studied the in-game role of the instructor in vocational military training. She created a framework for instructors called ‘coaching-by-gaming’, in which she emphasises the importance of an active instructor role during game play. This framework also includes puckstering, an idea where instructors controls in-game avatars. With puckstering, which is applied at the Swedish Land Warfare Centre, the instructor can influence and steer in-game events without breaking players’ suspension-of-disbelief. This might constitute a means to prevent gamer mode in soldier training, yet in wargaming and higher tactical training puckstering refers to a slightly different role. In wargaming puckstering usually means having to have people in control of subordinate and higher commands units, which makes the pucksters part of the game control. This is done to make the play process easier and to make the training audience focus on their decision making and learning objective (Perla & Markowitz, 2009). It is doubtful that puckstering in a wargaming environment will prevent gamer mode to occur, but perhaps pucksters can point to and stress the importance of different aspects of the scenario. But correcting the players’ disposition to exploit the rules must probably take place in direct dialogue with an active instructor monitoring the game play.

As a side note, wargaming is usually played once in a course, which means that the instructors need to make the best use of the time available and control player behaviour as best they can. If time is not a limited resource and there is an option to play the game repeatedly, then perhaps it is sufficient to discuss the topic of playing to win versus learning during debriefing.

The reason I wanted to highlight the instructor’s responsibility to handle unwanted gamer mode incidents could perhaps be seen as somewhat superfluous in a historical perspective. Throughout the long history of wargaming instructors or umpires have always been present to facilitate the activity. Yet advancements in training technology, in
particular the use of computers, make it possible for a mass audience to engage with wargaming without the presence of instructors. In those situations, mainly driven by an urge to reduce costs, we will have similar problem as in the courses I have studied. The instructor is forced to oversee many gaming processes simultaneously, which then paves the ground for gamer mode to occur more frequently and in a detrimental manner.

The premise that wargaming requires players to adopt the role as commanders is perhaps a paradox as the educational objective is to learn that role. The degree of role-playing depends on players’ expertise of the game and the characteristic of the role profile (Crookall, Oxford, & Saunders, 1987) and if you don’t understand this role it is hard to act out on it. Yet this only highlight that wargaming should not be performed separated from other learning phases. These earlier learning stages prepare students, learning the basics, informing them of what is required of them as officers. Unless of course the wargaming is conducted with a mix of novices and experts in a master and apprentice fashion as the described in Lave & Wenger (1991) Communities of practices.

This leads me to issue some warnings when it comes to distance learning with wargaming – at least in those settings where it is assumed that the learners will play on their own. Without instructors nearby, events can turn out as observed in my studies where the activity became a sport to the players. Based on the data in my studies, we may doubt that players by themselves will have the ability to maintain a presumed orientation towards the gaming activity. This is probably true also for all the events that unfold during play. To transform an event into a lesson learned requires either a disciplined learner who is able to extract what can be learned from a situation (Kirschner, Sweller, & Clark, 2006) or an instructor who can support the process of assigning meaning to a situation.

However, I do not believe that just because the instructor is nearby we have an insurance that gamer mode will not occur. It is challenging enough to facilitate a wargaming process, if the instructor also has to inspect and, on occasions, correct the reason why players made certain decisions, the gaming process would become too complex. In my study I have been privileged to see how players reason around their decision and from that I have been able to determine a player orientation – but only after substantial and reflective analysis. In the staff course where I
observed gamer mode for the first time I could see how it produced unwanted effects on the staff process even though an instructor was present facilitating the activity.

In chapter 2, Background, an idea was presented that argued that the expansive development of entertainment games has shaped human interaction with games and poses a potential threat to military gaming. I will now return to this argument and discuss further what this has to do with gamer mode. Throughout this cover thesis I have presented gamer mode as something negative, that it is unwanted from an educational perspective. However, this is not the same as saying it is unnatural.

In my data I could see traces of how players adapted to the game. For instance, in the study presented in paper III, where I manipulated the game design, I could see how players were encouraged to employ a specific tactic. When I measured the standard deviation from game matches with victory points it was much smaller than those played without points. This suggests that playing matches with clearly defined, measurable goals, manifested as victory points, made players adapt to the game in a specific way. They learned that an aggressive tactic had a bigger payoff in the game although this tactic generated a lower health value of the units. This tactic is not clear evidence of gamer mode; it is an indication of gamer mode, but we still can see it as a tendency that players adapt to the game rules, which in the long run would mean that players are inclined to enter gamer mode after extensive or repetitive play.

Upon reflection, this is not surprising. If the rules of a game define what is supposed to be achieved, then why would players need to take into account the fiction or theme of the game? Juul’s argument (2005) that fiction matters and through fiction the player can understand the conditions of the game is perhaps more applicable to beginners and novice players. Experts who fully understand all the rules and can shape a winning strategy (Schild, 1966) to achieve them need not worry or take into consideration what the theme is meant to represent.

This means that my proposal, to have a balance between lusory orientation and professional orientation, will have a temporal dimension associated with it. After frequent or repetitive use the professional orientation will diminish and give way to only a lusory orientation. This then would mean that gamer mode is not an unnatural phenomenon; it is
perhaps the most likely way in which humans approach games. This temporal dimension, together with the fact that entertainment games are part of many human lives, means that gamer mode or a lusory orientation toward games is the natural way of how to play a game. And teachers in the military should then not be surprised that the players in military games struggle to maintain a professional orientation. Perhaps we should regard an *as if* player orientation as a special case and not the other way around. Perhaps military training with games should embrace gamer mode as something to expect and develop methods to manage gamer mode.

The winner takes it all – encouraging thinking outside the box

When discussing gamer mode in military education, I want to offer an additional perspective as to whether gamer mode is bad for military training. On the one hand, it is negative and undesirable as it goes beyond what the players are supposed to learn. On the other hand, gamer mode illustrates a person who takes all measures to win, and this cannot be only bad. This winning attitude is exemplified in the Star Trek movie *Wrath of Khan* (Meyer, 1985). In the story, the Starfleet Academy cadets are faced with a no-win training scenario called Kobayashi Maru. The cadets are of course frustrated that they cannot do anything to win in this scenario. They are told, however, that the Kobayashi Maru is a rescue scenario to “test the character of the cadets” and winning is not important for this objective. Despite this, the lead character, Captain Kirk, was the only cadet to beat the scenario. When asked by a younger officer how he managed to do this, Kirk says “*I reprogrammed the simulation so it was possible to rescue the ship*”, and then smiles to the young officer: “*You see, I don’t like to lose...*”. Captain Kirk’s behaviour is of course cheating in an objective sense, but the scene exemplifies how some people are so eager to win they start thinking creatively and out of the box.

Some of this creative thinking and adaption of a ‘winning attitude’ ought to be encouraged from a military perspective. Regardless of what military education can do to prepare commanders for future conflicts and uncertainties, a creative mind that can do the unexpected will perhaps be as valuable as following tactical regulations and doctrines. Commanders who can think out of the box and make use of exploits in the ‘rules’ probably have this ability. With this argument, gamer mode should not be
regarded as a problem but an indication of a person having the ability to overcome complex tasks by unconventional methods.

To end the discussion of gamer mode we can see how the term applies to society in a wider perspective. Though my focus is military education with games and that gamer mode has both positive and negative qualities, it of course also appears in other domains. Gaming the system is a familiar concept in many walks of life. When investors choose to exploit shortcuts and weaknesses in the financial systems to make profitable transactions one can argue they are gaming the financial system. In the school system, especially higher education, students have been observed to exploit the rules by seeing the higher education as a system and optimize their behaviour to succeed in exams (Miller & Parlett, 1974), while neglecting the principal learning objective. With these observations gamer mode describes people who are willing to find short-cuts in life to their own benefit which is surely something negative. Yet it also direct attention to that every system we can perceive is exposed to exploitation, it just requires a conscious agent with a motivation to pursue this exploitation.

6.4 IMPLICATIONS ON THE RESULTS ON WARGAMING RESEARCH

The indirect contribution to the wargaming practice that this thesis offers concerns the research approach I have taken. Given the premise that wargaming is a fairly unresearched activity, few studies have critically challenged the built-in assumptions that wargaming is always a good thing and should be part of any training. If we want make sure that our learning practices are efficient and ensure that wargames are used properly, we need to move further away from the trenches of anecdotal evidence. We need empirical results to be able to reason around wargaming and back up the claims we make. An academic approach to this practice can provide such a traceable perspective, and although small in contribution, I hope this thesis with its empirical findings will add to this undertaking.

6.5 METHODOLOGICAL REFLECTIONS

First of all, I must discuss the ethics of intervening and changing a course by adding a research objective to it. In my studies I manipulated the way the cadets play their game by altering the design. Although this is
valuable for me as a researcher, it also means I potentially influenced the learning processes and outcomes for the students. I may be satisfied with finding how victory conditions have a bad influence on the strategy of the cadets, but by this I also posed a potential impediment to the learning of these cadets. This may be seen as unethical from a student’s perspective, but it was taken care of during the debriefing afterwards. I believe these shortcomings are worth such research or are necessary when conducting educational research on a specific practice. We want to preserve the conditions and the context of learning, which means we want the didactic setting to be as authentic as possible. The research could not have been done without the approval and support of the teachers of the course. We conducted dialogues on how to best approach the wargaming, which would cater to both educational and research needs. Any potential impediments to learning we made during the week were compensated by longer debriefing afterwards, during which we focused on lessons learned and sharing of experiences with the cadets.

My approach to study wargaming ‘in the wild’ has been both difficult and valuable. On the con side is the time-consuming task to perform qualitative studies on players’ interaction with games with an in situ approach. For every hour videotape recording I estimate that three hours were spent for transcribing, making sense of the situation, and categorising the interaction. From recording everything I was faced with vast amounts of episodes that needed to be labelled as either being important or unimportant to what I was studying. The background noise and disturbances from surrounding factors are massive. People constantly talk to each other about irrelevant things as well as mingle in game-related topics.

Many times player interaction was interrupted by non-related issues, such as faulty usage or technical issues, which made the analysis difficult. As I wanted to find the trigger factors of certain interaction patterns I wanted to get hold of the players’ reasoning, the inner reasoning of the students, and why they made certain decisions. For obvious reasons this is almost impossible by just observing a player controlling a game. However, it is not unattainable. After hours of analysing video recordings there were moments when players suddenly clearly revealed their reasoning, often in dialogue or in argument with fellow learners. This were, so to say, ‘the golden nuggets’ in video analysis where I could begin unpacking the surrounding factors and link their utterances to what
happened before, what was going on in the game, and what happened afterwards. In the end I was able to further my understanding on how learning with games actually is materialised, how the inner properties of gaming stimulates players into a learning process.

Getting a grip on cadets reasoning was made simpler when we used a turn-based wargame. This allowed the cadets to reflect upon and discuss the game events when their opponents made their moves. Although this was beneficial for me as a researcher trying to get a grip on the situation, the turn-based wargame made it difficult to clearly portray dynamics in the game. The player could not act and react simultaneously as they would if they played a game in real-time. As for the learning objective in this course real-time was not really critical, but it is worth mentioning that the turn-based game influenced the set of options and possibilities the cadets could do.

On the pros side of approaching wargaming ‘in the wild’ is that I was able to make arguments on real problems as I was studying wargaming as it is actually being used in education, in its naturalistic setting, which for instance means that the expectations from all participants (learners, teachers, and instructors) are preserved. Although finding certain interaction patterns is a time-consuming and rather complex task, it is of great value to become acquainted with the data and unpack the interaction. During my analysis of the video material I became aware that learning situations consist of so many interrelated components that I had problems seeing the value of doing it in any other, controlled or reduced, way.

My identified pros and cons are probably the same for researchers performing qualitative studies of humans in action in general. Although the process is time consuming and complex, I strongly believe research on game-based learning needs this kind of research. During the third study, where I made a quantitative study of how military units were treated when playing with victory points, I could easily compare game sessions and make claims on effects of the manipulation. Even though I could interpret the quantifiable results into what probably happened during the game play I could not explain more of what actually did happen. I could not further my understanding of how players reasoned on the game, the educational situation and their identities in relation to the practice. It becomes a proof without a proper explanation – unless put alongside the qualitative studies that preceded it.
With a mixed approach, where quantitative research approaches are complemented with qualitative analysis, I think educational research can go much further. It will help researchers understand the big picture by presenting results by numbers that are based on controlled studies and at the same time unpack specific or representative interaction to colour these numbers. Taken together this will generate an illustration of a learning situation where we as researchers do not have to make so many uncertain interpretations and guesses but instead lean on the results that use merits from both qualitative and quantitative analysis.

However, I have encountered a fundamental problem that took me only so far with the mixed approach. As mentioned in the Results chapter, gamer mode needs to be operationalised in ways by which one can perform a quantitative analysis of the data. If we could find ways to measure the frequency and time span of players being in gamer mode we could relate these results with analysis of the battlefield or other consequences. Yet this requires clear indicators of gamer mode at any given moment, where gamer mode is delimited from other orientations toward the gaming situation and where we can make field notes and rate the students’ playing style and behaviour on different scales. Anyone familiar with studying humans in action understands that such a task is hard, if not impossible, as we cannot get full access to the thoughts, feelings, and attitudes of a human being – other than for the overtly accessible parts of those processes. What we can do is find echoes of gamer mode. I understood that gamer mode occurred when cadets told each other why they wanted to perform or had just performed certain actions. However, I was not able to capture all those moments when players in gamer mode silently performed game-specific actions to win the competition, as those actions were indistinguishable from actions taken while trying to stay “in role”.

In chapter 3, I described my journey as a Ph.D. candidate from designing games to studying games in action. I saw this new focus as necessary, because it would provide me with an understanding of how gaming as learning method is revealed in practice. I would not say I regret this change of focus, but with my results at hand, I will now most likely return to the original idea on how to design learning games – this time, however, with a much richer and deeper understanding and awareness of what may spur gamer mode and how the different elements in a pedagogical setting,
such as the game used, facilitators, and group composition and debriefing, all contribute to nurture learning.

6.6 THROWING DOWN THE GAUNTLET — CHALLENGING OUR FIELD AND TRAINING PRACTICE

I hope this thesis marks a beginning to a series of studies on gamer mode. I have chosen a couple of aspects in issues of using games in military education, but I have only scratched the surface in identifying the influencing factors. My work has explained occurrences, reasons, consequences, and proposed ways to manage gamer mode, but in each single perspective there is room for more studies with other approaches. It would be interesting to understand whether previous gaming background influences play behaviour, or what the level of expertise in warfare matters for the gaming. My study object is wargaming with digital wargames, and I am curious if studies performed on manual games, such as board games or map games, will reveal same results.

We have also found direct use of my results in our schools’ educational program. In courses that include wargaming we usually talk about gamer mode with the students in the introductory lecture. We discuss the definition of the term, give details on symptoms from players being in gamer mode, and open a discussion on the relation between realism and wargames. I have noted that this has provided the students with a term they use in their gaming. I regularly hear utterances from cadets where they warn each other to not fall into gamer mode or where they use the term to negotiate between game-specific actions and what is expected from them as officers. I cannot explain if gamer mode to them is simply a new term for a well-known phenomenon they already are familiar with or if we have equipped the students with an awareness of issues with learning with games and thus increased their so-called “game-based learning literacy”. Nonetheless, I find it satisfying that there has been a direct contribution to learning with games in the Swedish National Defence College. We have also found it useful to have bigger groups in our wargaming activities. We no longer encourage using small playing groups as we acknowledge and recognize the communication element for learning tactics and strategy. Newcomers and learners with less experience of decision making quickly adapts to the environment and learns from more experienced students as they participate in a cooperative struggle against a live opponent.
Let us return to the beginning of this thesis, to the office where officer students played a naval wargame and where the commander had just issued an order to turn on all active radar and fire the missiles against a target to the west. With the results of this thesis at hand we can perceive this situation in a new light. What happened to the commander is that he got carried away by the competitive aspect of the game, that he was so focused on winning this match that he was willing to sacrifice the realism properties of his order. The game allowed him to use both the active radars and the weapon systems on-board a sinking naval vessel. However, issuing that order would make him abandon the professional orientation towards the game; a real commander would not consider it, as this is not possible to do. Instead he would probably take measures to rescue any surviving sailors. The commander enters gamer mode, as his orders and actions are rational to the game rules but irrational to the real-life situation.

There are many ways this behaviour can be prevented. First of all, the game has some obvious flaws that need to be considered and corrected. We know, however, that the remedy for entering gamer mode cannot be solved by better design, as the game is only a bleak mirror of warfare. Even though the game design is created with a goal to minimise all inconsistencies, there will always be some features in the game structure that are open for player exploitation. Instead, an instructor should follow the wargaming activity and be supportive in the officer students’ reasoning and interrupt them at the appropriate time. The instructor should pause the game for a while to be able to correct and discuss the issue with the commander who just issued the order to fire the missiles. If this is not possible for practical reasons, the instructor should spend some fair amount of time during debriefing to discuss the difference between game logic and maintaining a realistic approach to naval warfare. And as the students are fully aware of the concept of gamer mode, they will understand the difference between playing a game for entertainment purposes and playing to learn – ultimately ending up better equipped to deal with and find relevant strategies for warfare.
7 REFERENCES


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