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Bachelor's Thesis in Entrepreneurship and Innovation

From Board Games to Unicorns: Gamification and Its Impact on Ideation for Nascent Entrepreneurs

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Abstract

Title: From Board Games to Unicorns: Gamification and Its Impact on Ideation for Nascent Entrepreneurs

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Keywords: Gamification; Innovation; Ideation; Entrepreneurship; Nascent entrepreneurs; Idea generation

Research question: What are the effects of gamification on ideation for nascent entrepreneurs?

Purpose: The purpose of the study is to contribute with increased understanding of how decision-makers in startups argue when choosing location of production.

Methodology: Quasi-experiment with a deductive logic of inquiry, executed through semi-structured interviews. The empirical data presented in the analysis stems from the transcription records that were recorded before and after conducting the workshops that made up the experiment. The workshops themselves consisted of a board game that was played by three participants, in three separate workshops.

Theoretical perspective: The theoretical framework has its foundation in previous research that has been conducted regarding innovation, ideation and gamification.

Result: The results from the semi-structured interviews were presented in relation to their respective "gamification outcomes" (hedonic, utilitarian & social) that also served as the foundation for the interview guide. Different experiences were recorded, however most of the participants stated that the game elements that the game encompassed were predominantly positive in nature and added to the experience in various ways.

Conclusions: The findings suggest that gamification can be an effective method for enhancing the ideation process, particularly for individuals who struggle to stay motivated or focused, leading to more innovative and unique solutions in the majority of cases. Additionally, the long-term sustainability of the effects of gamification on ideation remains uncertain. Despite these limitations, gamification impacts ideation by serving as a powerful

tool for entrepreneurs looking to boost motivation, engagement, creativity and potentially learning.

Preface

Dear participants, fellow students and supervisors,

We would like to express our sincere appreciation and gratitude for your involvement and support during our thesis research. Your contributions have been invaluable, and we are grateful for the time and effort you have dedicated to this project.

Your participation as study subjects has provided us with valuable data and insights that have greatly enhanced our research. Your feedback and comments have helped to shape and refine our ideas, and we are grateful for your willingness to share your experiences and perspectives.

We would also like to thank our supervisor, Joakim Winborg for your guidance and support throughout the research process. Your expertise and advice have been instrumental in helping us to navigate the complexities of our project, and we are grateful for your mentorship and support.

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Jonathan Rooth

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1 Introduction

In the introduction the context and the background is presented for the subject in question. From this follows a problem formulation which lays the ground for a research question and the purpose of the paper.

1.1 Background

Ideation or idea generation is the process of generating new business ideas, and is an essential part of the entrepreneurship journey. According to Rainer and Fayolle (2017), ideation involves identifying opportunities and coming up with innovative solutions to problems or gaps in the market.

For nascent entrepreneurs, individuals engaged in the creation of a new project or venture, (IGI Global, n.d.) ideation can be particularly challenging. Many first-time entrepreneurs may lack experience, knowledge, and resources, which can make it difficult to come up with new and viable business ideas (Fayolle et al., 2015). In addition, the process of generating ideas can be time-consuming and daunting. As a result, many nascent entrepreneurs may struggle to stay motivated and focused (Rainer and Fayolle, 2017).

Amabile (1996) demonstrated the importance of "fun and play" to foster creativity, which can have further implications when using game design elements in ideation. Game design elements refer to the components that are used to make a non-game activity more engaging and enjoyable. These elements are borrowed from traditional games and are used to motivate and reward players for achieving specific goals or objectives. Some of these elements include points, levels, leaderboards, badges and quests (Deterding et al., 2011). In order to address the challenges nascent entrepreneurs are faced with in the process of ideation, the "power of play" can thereby be considered. According to Einstein, games are the most elevated form of investigation (Einstein, n.d.) and some of the benefits they bring are joy, inspiration and improve cognitive, creative, collaborative and leadership skills (Entertainment Software Association, 2022).

The idea of benefiting from these factors led to the creation of the relatively new term "gamification", which gained popularity in 2010 (Deterding et al., 2011). Gamification can be described as using game design elements in non-gaming situations to promote engagement, motivation and enjoyment, especially in performing complex and difficult tasks to achieve certain goals (Robson et al., 2015). In the context of ideation for nascent entrepreneurs, gamification could play a role in addressing the challenges mentioned above by using game design elements to incentivize and reward the generation of new business ideas.

Considering the benefits of gamification an increased number of disciplines, including education and marketing, have studied the implementation of gamification. While gamification has been shown to be effective in a variety of contexts, including education and employee training (Kim & Kim, 2019), user/employee engagement (Robson et al., 2016), as well as gamification and innovation (Patricio et al., 2022) its potential applications in the realm of entrepreneurship and ideation have not yet been fully explored. According to Brown (2020), more research is needed to understand how gamification can be used to support and enhance the ideation process for entrepreneurs.

This essay, which builds on ideation theory, examines the effects of gamification in the process of identifying, coordinating and being motivated to develop new ideas. In order to achieve this a complementary MDE-framework (Mechanics, dynamics, emotions) (Robson et al., 2015) is introduced to provide a supporting structure to gamification.

1.2 Problem formulation

The effects of gamification on ideation for nascent entrepreneurs are not well understood and have not been extensively studied. This lack of understanding poses a significant problem, as gamification has the potential to be an effective tool for engaging and motivating these individuals in the early stages of the ideation process. However, without a clear understanding of how gamification impacts ideation, it is difficult for practitioners to implement gamification in a way that is both effective and appropriate for individuals engaged in the creation of a new project or venture.

Furthermore, there is a lack of consensus on the best practices for gamifying ideation. While some studies, such as Hamari et al. (2014), have found positive results for the use of gamification in ideation and entrepreneurship, other research has suggested that the effectiveness of gamification may be more limited or context dependent. For example, Brown (2020) conducted a systematic review of the literature on gamification in entrepreneurship education and found that the use of gamification was generally associated with positive outcomes, such as increased motivation and engagement. However, the review also found that the effects of gamification were highly dependent on the specific design and implementation of the gamification intervention, and that more research is needed to understand the factors that contribute to successful gamification in entrepreneurship.

Other studies have also raised questions about the generalizability of the findings on gamification in ideation and entrepreneurship. For instance, Cheng and Chen (2018) conducted a qualitative study of gamification in entrepreneurial teams and found that the impact of gamification on idea generation was highly dependent on the specific characteristics of the team and the context in which the gamification intervention was implemented. This suggests that the effectiveness of gamification in ideation may vary depending on the specific needs and goals of the entrepreneurial team.

One of the key challenges in studying the effects of gamification on ideation is the lack of consistency and standardization in the definition and measurement of ideation (Hamari et al., 2015). Ideation is a complex and multi-dimensional process, and different researchers and practitioners may have different understandings of what it entails and how it should be measured. This makes it difficult to compare and synthesize the existing research on gamification and ideation, and to develop a comprehensive understanding of the concepts.

This study aims to address these challenges by investigating the effects of gamification on ideation for nascent entrepreneurs. The research question that this study aims to answer is:

- What are the effects of gamification on ideation for nascent entrepreneurs?

To answer this question, this study will employ a mixed-methods research design, incorporating qualitative data collection and analysis. This will include a systematic review

of the existing literature on gamification and ideation, as well as in-depth interviews with nascent entrepreneurs who have used gamification in their ideation process.

The findings of this study will have implications for both practitioners and researchers. For practitioners, the study will provide guidance on the use of gamification in the ideation process, including best practices and potential challenges. For researchers, the study will contribute to a better understanding of the effects of gamification on ideation, and how these effects may vary across different entrepreneurial contexts (e.g. industry, background).

In conclusion, this study seeks to contribute to a better understanding of the potential of gamification to support the ideation process for nascent entrepreneurs. This is important not only for the success of individual entrepreneurs, but also for the broader innovation ecosystem. By providing insight into the effects of gamification on ideation, this study can inform the development of more effective tools and techniques for supporting the early stages of the entrepreneurial process.

1.3 Purpose

The purpose of the study is to investigate the effects of gamification on ideation for nascent entrepreneurs, and to provide guidance on best practices for gamifying ideation in this context. This study aims to contribute to a better understanding of the potential of gamification to support the ideation process for nascent entrepreneurs, and to inform the development of more effective tools and techniques for supporting the early stages of the entrepreneurial process.
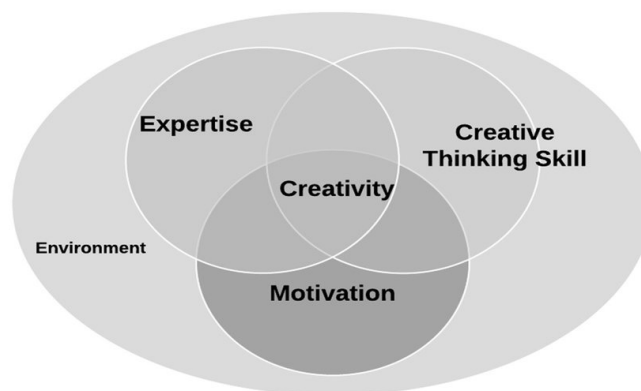
2 Theoretical perspective

In this second chapter, the underlying literature for the theories used are presented. Theories surrounding ideation will be presented first. After, theories surrounding gamification will be presented.


2.1 Ideation

Ideation is the process of generating and developing ideas, and is an essential component of the entrepreneurial process. From a theoretical perspective, ideation is often conceptualized as a cognitive process involving the generation, evaluation, and selection of ideas (Amabile, 1996; Simonton, 2012). This process is influenced by a variety of individual and situational factors, such as the knowledge, skills, and experiences of the entrepreneur, as well as the context in which the ideas are generated (Amabile, 1996), illustrated by the Componential Model of Creativity, as seen below.

Figure 1, Componential Model of Creativity (Amabile 1996)

From a psychological perspective, ideation is often considered to be a form of creative thinking, involving the generation of novel and useful ideas (Sternberg and Lubart, 1996). This process is thought to be driven by the interplay of three key components: domain-relevant knowledge, creative-thinking skills, and intrinsic task motivation. Domain-relevant knowledge refers to the knowledge and expertise that an individual has in a specific field or domain, which provides the foundation for idea generation. Creative-thinking skills refer to the ability to generate and evaluate ideas in a flexible and adaptive manner, and to combine and modify ideas in novel and useful ways. Intrinsic task motivation refers to the

individual's interest, enjoyment, and engagement in the ideation process, which can motivate and sustain the generation and development of ideas (Amabile, 1996).
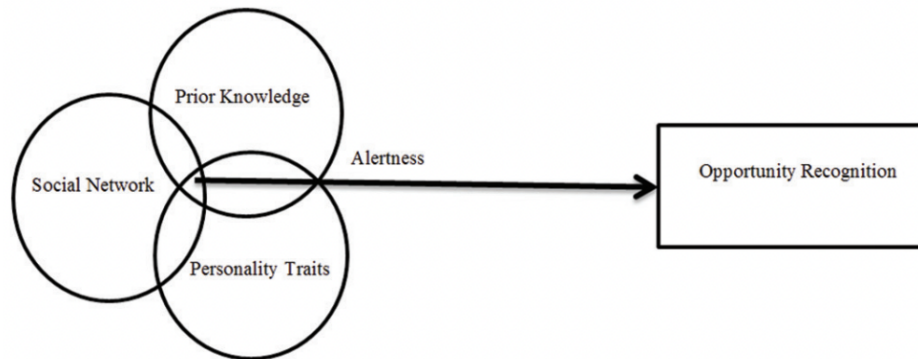
Figure 2, A model of the opportunity recognition process (Schamudeen et al.,, 2017)

Opportunity recognition, or the ability to identify and evaluate potential opportunities for business or innovation, is another key aspect of entrepreneurship (Baron, 2006). Research on opportunity recognition has identified a number of individual and situational factors that can influence the ability of entrepreneurs to identify and pursue new opportunities, such as prior knowledge and expertise, network connections, traits and alertness (Baron, 2006). In addition to ideation theory, the literature on opportunity recognition may also be relevant to research on gamification and ideation for nascent entrepreneurs. Entrepreneurs who are able to effectively recognize and evaluate potential opportunities may be more likely to generate new and innovative ideas, and may be more likely to benefit from gamification interventions that support the ideation process.

Moreover, ideation theory (Amabile, 1996; Simonton, 2012; Sternberg and Lubart, 1996) can be useful in researching the effects of gamification on ideation for nascent entrepreneurs for several reasons. First, ideation theory provides a conceptual framework for understanding the cognitive processes involved in idea generation, evaluation, and selection. This framework can be used to identify the specific aspects of the ideation process that may be impacted by gamification (Hamari et al., 2015; Deterding et al., 2011), such as the generation and evaluation of ideas, and the motivation and engagement of the entrepreneur.

Second, ideation theory can be used to identify the individual and situational factors that may influence the effects of gamification on ideation (Amabile, 1996). For example, ideation

theory suggests that the effects of gamification on ideation may be influenced by the domain-relevant knowledge, creative-thinking skills, and intrinsic task motivation of the entrepreneur (Sternberg and Lubart, 1996). By considering these factors, researchers can gain a more nuanced understanding of how gamification impacts the ideation process for nascent entrepreneurs (Hamari et al., 2015).

Third, ideation theory can be used to develop hypotheses about the effects of gamification on ideation (Deterding et al., 2011), and to guide the design of research studies investigating these effects (Hamari et al., 2015). For example, based on ideation theory, researchers may hypothesize that gamification will have a positive effect on the generation and evaluation of ideas, and that this effect will be mediated by the entrepreneur's intrinsic task motivation (Amabile, 1996). Conversely, researchers may hypothesize that gamification will have negative effects on the quality of the ideas, as the entrepreneur may be persuaded to generate a magnitude of ideas in order to accrue points and win the game, instead of generating a few but high-quality ones. These hypotheses can then be tested using appropriate research methods, such as experiments or case studies (Hamari et al., 2015).

At last, ideation theory can provide a useful foundation for researching the effects of gamification on ideation for nascent entrepreneurs (Deterding et al., 2011), by providing a conceptual framework for understanding the ideation process, identifying factors that may influence the effects of gamification (Amabile, 1996), and developing hypotheses about the effects of gamification on ideation (Hamari et al., 2015).

2.2 Gamification

Nick Pelling, a game designer, coined the term "gamification" in 2002 (Dale, 2014; Galetta, 2013), but it wasn't until the 2010s that it gained popularity and the definition that is used most frequently in the literature: the use of game-based elements in non-game contexts to encourage users to engage in desired behaviors (Deterding et al., 2011).

Gamification is still a relatively new idea, despite the rising amount of knowledge. It should not be confused with other types of rewards and loyalty programs that might employ gamification-like tactics but that only serve to convince users to act in a certain way in order to accrue "points", such as play, team building exercises, traditional games, and reward

systems (Ruhi, 2015). Gamification is a process that goes beyond simply using game tools and aspects for entertainment (Harwood and Garry, 2015). It produces a variety of game dynamics, including rewards, competition, altruism, and self-expression, supporting the fulfillment of employees' psychological needs, such as autonomy, competence, and relatedness.

The choice of game components, such as awards and degree of competition, depends on what genuinely inspires and maintains players' interest (Dale, 2014). Since game components alone do not always improve participant engagement, gamification strategies must apply concepts such as the MDE-framework (mechanics, dynamics, emotions) (Robson et al., 2015). Inspired by psychological theories, the framework allows for the consistent and effective use of game-designed elements in innovative processes and gives users inspiring and motivating experiences (Robson et al., 2015).

Human motivators are combined with user-centered design principles to ensure a truly player-centered experience, i.e., the necessary components for making a gaming experience beneficial for the player. Achieving this well-balanced experience is crucial because engagement can only be attained when the user is fully absorbed in a difficult and fascinating task and enters a flow state. This is characterized as an emotion of joy and inspiration related to playing a game that keeps the user from becoming bored (Jones, 2013).

Human behavior may be driven by external or internal factors (Hamari and Koivisto, 2015). Extrinsic motivation is the term for incentives that come from an outside source (such as rewards or money), such as being driven to complete a task in order to get payment (Hamari and Koivisto, 2015). It is described as acting in a certain way in exchange for money or verbal praise, among other extrinsic rewards (Mekler et al., 2015). The term "intrinsic motivation" describes motives that originate from within, such as enjoyment, fun, and self-directed activity. Being internally motivated without external influences influencing the will to act (Hamari and Koivisto, 2015). It refers to engaging in an activity purely out of intrinsic pleasure or enjoyment (Mekler et al., 2015).

2.2.1 Gamification outcomes

To organize the possible impacts of gamification, the classification system proposed by Cardador et al., (2017) was used. This system divides the effects of gamification into three categories: hedonic, utilitarian, and social.

Hedonic outcomes refer to the pleasure and enjoyment that people experience from playing games. Gamification can increase hedonic outcomes by providing people with a sense of accomplishment, a feeling of control, and the opportunity to engage in activities that are challenging but not overly difficult. Moreover, it includes components such as playfulness, enjoyable learning experiences, and engagement (Cardador et al., 2017).

Utilitarian outcomes refer to the practical benefits that people derive from playing games. Gamification can increase utilitarian outcomes by providing people with valuable skills and knowledge, helping them to perform tasks more efficiently, and increasing their productivity (Cardador et al., 2017). It is characterized by having a positive impact on components such as Cognitive, functional and creative problem-solving, as well as better time-to-action and utilization of available tools (Gatautis et al., 2016).

Social outcomes refer to the interactions and relationships that people have with others while playing games. Gamification can increase social outcomes by providing people with opportunities to collaborate and communicate with others, and by promoting social connections and a sense of community. Positive consequences from gamification within this category points to things such as increased recognition of opportunity, increased social influence, and higher self-esteem (Cardador et al., 2017).

These three categories will be present all through the paper, as they are the foundation upon which the interview guide was written. They also serve as subheaders in two of the upcoming chapters; "Presentation of empirical data" and "Analysis".

2.2.2 MDE-framework

The *MDE-framework* is a framework that was created in order to clarify how to design, implement, manage, and optimize gamification strategies. It highlights the briefly

aforementioned, fundamental principles (mechanics, dynamics, emotions) upon which a successful gamification experience in the ideation phase might be created (Robson et al., 2015).

First off, there are three types of *mechanics*: (1) Setup mechanics, which sets up the environment in which the game is played and encompasses all things related to the game's structure. This includes simple decisions such as where the game is played as well as more specific ones such as how many players that'll be playing, if it's turn based or real-time, and what objects will be needed. (2) Rule mechanics is the part in which the concept for the game is created and where the goals that the players will pursue is set. This includes both the constraints that might work to put a bit of pressure on the players as well as the different actions that will be possible within the game itself. They might either be deterministic so that player input will result in the same result each time, or non-deterministic so that the outcome changes when players interact with each other. For example, often used game mechanics are "time-based rule mechanics" and "objective-based rule mechanics". (3) Progression mechanics are a set of instruments that's implemented with the purpose to affect the player experience as the game goes along by awarding behaviors that's intended and encouraged to be repeated within the game, and which also serves to give the player feedback regarding how and if he/she is moving towards victory. By way of encouraging these behaviors, reward systems are often implemented. These could take the form of levels, progression bars, resources, points or physical rewards. If implemented however, it's of great importance that the awards themselves are desirable in the eyes of the players, as they would lose their purpose completely if they are not (Robson et al., 2015).

The principle of *dynamics* within gamification refers to the kind of player behavior that results from people actually playing the game. This type of behavior is therefore more reliant upon how players chose to follow the mechanics rather than being completely reliant upon said mechanics. In more competitive, individual-based games, player decisions have been known to lead to unintended actions such as conspiring, cheating and bluffing, whilst when creating more team-based games, it's been known to more often lead to cooperation and similar bilateral actions. These actions are normally hard to predict and often lead to outcomes and behaviors that weren't intended when the game was designed. This presents a challenge for the game designers, as they'll have to try to predict the possible emergence of dynamics and build the game with these possibilities in mind (Robson et al., 2015).

Emotions is the last principle that has to be taken into consideration when setting up the gamified experience. As the name suggests, it points to the reactions and mental states that's felt by the players when following the game mechanics and when experiencing the dynamics that emerge when playing. In order for the gaming experience to be perceived as engaging and for the players to want to keep on playing, it's of paramount importance that the game is fun and appealing. For a game to be "fun", it does not however necessarily mean that all aspects of the game should make you happy but rather that it should take you through a wide range of emotions such as excitement, disappointment, surprise, amusement, personal triumph as well as adversity (Robson et al., 2015).

These principles in conjunction with one another is what constitutes the *MDE-framework.* It is their individual functions as well as their interdependent relationships to one another that collectively create the player experience. They are very closely connected to one another, which in many cases will mean that a small change in one may lead to quite noticeable changes in another. Conclusively, it could be said that in order for a person to successfully set up a gaming experience, he/she should focus on understanding how game mechanics, game dynamics and emotions can work in unison as well as how these principles relate to and affect one another (Robson et al., 2015).

2.3 Proposition: Gamifying ideation

The effects of gamification on the ideation process for nascent entrepreneurs are multifaceted and depend on a variety of individual and situational factors.

Drawing on the proposition, gamification has the potential to positively impact the ideation process by increasing the quantity and quality of ideas generated, as well as the intrinsic task motivation and engagement of entrepreneurs (Hamari et al., 2015; Deterding et al., 2011). Ideation theory suggests that these effects may be mediated by the domain-relevant knowledge, creative-thinking skills, and intrinsic task motivation of the entrepreneur (Amabile, 1996; Sternberg and Lubart, 1996). For example, gamification may stimulate the integration and application of domain-relevant knowledge, as well as the flexible and adaptive use of creative-thinking skills, leading to the production of more novel and useful ideas (Amabile, 1996). Gamification may also increase enjoyment and interest in the ideation

process, leading to higher levels of intrinsic task motivation and sustained engagement (Sternberg and Lubart, 1996).

However, there are also potential risks and disadvantages associated with gamification. Gamification may lead to a focus on short-term goals and rewards, rather than long-term ideation and innovation, potentially reducing the potential value of the ideas generated (Deterding et al., 2011). Gamification may also result in a narrow focus on certain types of ideas, rather than a more diverse range of ideas (Hamari et al., 2015). Additionally, gamification may create negative consequences, such as increased competition and pressure among entrepreneurs (Hamari et al., 2015). These risks may be particularly pronounced if gamification is not carefully designed and implemented, or if it is not aligned with the specific needs and goals of the ideation process (Hamari et al., 2015).

In order to fully understand the effects of gamification on the ideation process for nascent entrepreneurs, it is important to consider both the potential advantages and risks of gamification, as well as the individual and situational factors that may influence these effects (Amabile, 1996; Hamari et al., 2015). Ideation theory provides a useful foundation for researching these effects and for guiding the design of gamification interventions that can optimize the ideation process for nascent entrepreneurs (Deterding et al., 2011; Hamari et al., 2015).

3 Methodology

In the methodology chapter that follows, the choices for the execution of this study are presented. Research strategy, research design, literature selection, sampling, data collection, data analysis and reliability, validity & ethics are explained. Every chapter also explains why each method has been chosen and what implications these may bring.

Gamification is effective when game components are based on what genuinely inspires and maintains players' interest (Dale, 2014). To study the role of gamification in ideation, a quasi-experiment (Cook and Campbell, 1979) was conducted on nascent entrepreneurs, including 6 university students and 3 employees of VentureLab, the student startup incubator at Lund University. The participants were selected based on the criteria that they were individuals engaged in the creation of a new project or venture, current university students or graduates, and had previous experience with ideation. Their previous methods and experiences with ideation served as a benchmark for the gamification method and the study as a whole.

3.1 Research strategy

To better understand the function of gamification in the ideation process, the following research question was formulated: What is the role of gamification on ideation for nascent entrepreneurs?

Thereupon the research process began, allowing for the articulation of the entire research design and a deeper comprehension of the connection between gamification and ideation. In order to address the research issue, two specific goals were established: i) Apply gamification in the idea generation phase ii) identify the role gamification may have in the process of forming ideas.

This study aims to address the lack of empirical research on the effects of gamification on the ideation phase by conducting a quasi-experiment using a deductive logic of inquiry. The research in this paper can be considered qualitative because it tests previous theoretical literature on a specific topic by collecting data regarding people's thoughts, feelings,

experiences, and perspectives on that topic and then comparing it to that literature (Bryman et al., 2019). The research was conducted using the main steps of qualitative research, as outlined by Bryman et al., (2019): (1) Identifying knowledge gaps and formulating general research questions→ (2) Selecting suitable participants that fits in with the purpose of the study and deciding on a preferable location to conduct studies→ (3) Collecting relevant data in a manner that suits the purpose of the research, in this case semi-structured interview→ (4) coding and interpreting the collected data through transcription and analysis → (5) engaging in conceptual and theoretical work by comparing the findings to previous literature in the analysis chapter.

Furthermore, qualitative research allows for authors to recalibrate and "tighten up" the specification of the research question as the study progresses. This is due to the open-ended nature of qualitative research that allows participants to bring up subjects and ideas that may not have been initially anticipated by the researchers The process can thus be seen as iterative, since the analysis and collection of data is done in parallel to a certain degree, and may result in the need to refine the remaining stages of analysis and data collection. A potential drawback that should be kept in mind however, is that when conducting this type of study there might be some difficulty in generalizing the results and applying them to the wider population. It may be difficult for the researcher to justify the wider application of the findings due to the limited sample size, especially when compared to a quantitative study with a larger sample size (Bryman et al., 2019).

This study is considered a quasi-experiment because it has many of the characteristics of a traditional experimental design, but does not meet all the requirements for internal validity. A true experiment is a study in which the researcher manipulates an independent variable to observe the effect on a dependent variable, while controlling for other extraneous variables. Quasi-experiments do not involve manipulation of an independent variable and do not have a control group. Instead, quasi-experiments rely on naturally occurring differences or pre-existing conditions to study the relationship between variables. In particular, the lack of random assignment of participants in this study may lead to groups that are not equivalent to one another, which may reduce the internal validity of the study. However, the purposeful selection of participants in this study has allowed for comparisons and parallels to be drawn based on their varying backgrounds and experiences. While a quasi-experiment may not have the same level of internal validity as a traditional experiment, it can still provide valuable

insights and should not be considered useless (Bryman et al., 2019). Quasi-experiments are thus useful in situations where it is not feasible or ethical to randomly assign subjects to different conditions, such as in studies of naturally occurring groups or in studies of public policy interventions (Cook & Campbell, 1979). By using a quasi-experiment, the study can evaluate the output and efficiency of ideation for nascent entrepreneurs, which is a complex process that takes into account multiple interrelated factors. This approach allows the study to contribute to the understanding of gamification in the ideation process for nascent entrepreneurs (Bryman et al., 2019).

As previously stated, the methodology follows a deductive logic of inquiry as the design of the research and the collection of data is driven by the specific research questions that stem from theoretical interests that have been set by the authors. Furthermore, it crudely follows the process of deduction as presented by Bryman et al., (2019). The deductive process of research involves consuming relevant theory→ forming a proposition→ collecting data→ revising findings→ analyzing data and confirming or rejecting the proposition→ and then revising theory. This is a simplified and linear representation of the deductive process, which rarely plays out exactly as described in actual research. It is important to note that this study involved more iteration and back and forth than the model suggests, as is characteristic of qualitative research. The deductive process may lead to the discovery of data that does not fit the original proposition, which may result in shifts in research questions and/or hypotheses. These possibilities are not reflected in the process model, however the authors of this paper still deem the model to be the most accurate representation of the logic of inquiry used in this study.

By narrowing the field of research to a qualitative study done through a quasi-experiment with a deductive logic of inquiry, the format of the project got more focused and unique. Although it is not intended for generalization to a larger public, the study is expected to allow other researchers to generalize their findings in similar given contexts.

3.2 Research design

The research design followed a comprehensive research process using a combination of methods during the course of 3 weeks. The methods included 3 group workshops, with three people in each group, in which the game "Ventures & Unicorns" was played and where

semi-structured interviews were held before and after every session (Table 1). Since the purpose of collecting data was to get the participants honest impressions of the gamified process, semi-structured interviews with a number of open-ended questions were used. The questions used followed an interview guide, as can be seen in 3.5.1. According to Bryman et al., (2019), open questions provide the opportunity for more truthful answers and minimizing bias by the interviewer. In order to make sure that usable data would be able to be collected from all workshops, the open-ended questions were accompanied by more specific questions that would be asked in cases where the analysts perceived that the information gained from the open-ended ones would not be enough to contribute in answering the research question itself (Bryman et al., 2019). The conversations were recorded and transcribed to minimize misinterpretations and facilitate the work of making the empirical evidence as similar to reality as possible (Bryman et al., 2019).

Table 1. Workshop groups

Activities	Informants	Participants
Gamification Workshop I	Group A	3
Gamification Workshop II	Group B	3
Gamification Workshop III	Group C	3

3.2.1 The game

The gamification tool "Ventures & Unicorns" was developed for the purpose of this project. It is a board game that is meant to engage participants in the ideation phase. The game was designed by utilizing the structures and references that could be found within the MDE gamification framework (Robson et al., 2015). The game's structure is also influenced by two previous games used in gamification of innovation. The first one is called "Ideachef", which is a game that focuses on further development of ideas in a game setting. In "Ideachef", players try to come up with solutions to problems and write their ideas down on post it notes, similarly to Ventures & Unicorns (Patricio et al., 2020). The second one is called "tiles", which focuses on ideation for the Internet of things (IoT). It uses support cards connected to the ideas to develop them further, similarly to the add-on cards implemented in Ventures &

Unicorns (Mora et al., 2017). Ventures & Unicorns is also influenced by the board-game "Monopoly", to make the game more familiar and enjoyable in the eyes of the players.
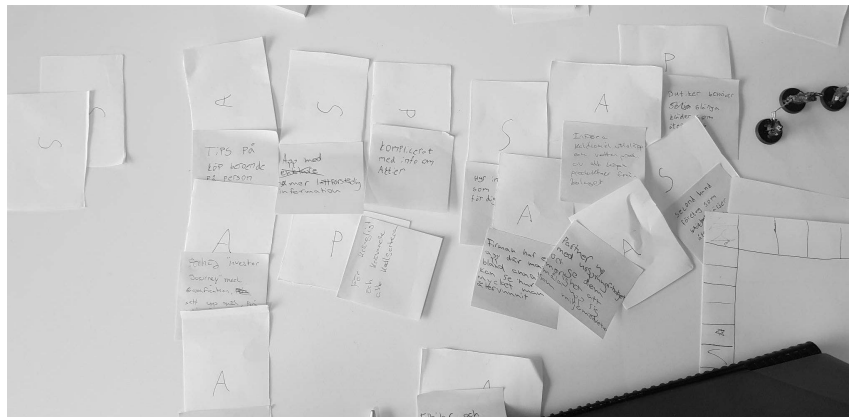
Figure 3, first draft Ventures & Unicorns

Ventures & Unicorns aimed to offer a challenging and engaging ideation experience. As seen in Figure 3, the first draft of the game was tested by the researchers with sticky-notes where players got rewarded by finding solutions on a diverse set of problems. Although it didn't immerse the researchers into the flow state, the draft gave practical insights in how the game could be improved. By implementing small changes, playing round-after-round and constantly iterating, the game got better through time. The completed version of the game is presented below, following the MDE-framework (Mechanics, Dynamics, Emotions). This final version was later on used in the three workshops.

Mechanics

Setup mechanics:

It can be used by up to five people with a minimum of three. A play board, currency called sparkles (Sp), personalized sticky notes, a timer, pencils, two dice, star cards, promotion cards and problem cards were all included in the kit that was required to identify and develop a chosen idea for a certain challenge.

Rule mechanics:

1. The board is divided into four sections as seen in figure 4. The first row (top area), focuses on environment and sustainability-problems. The second row (right area) focuses on health and wellbeing-problems. The third row (bottom area) focuses on social-problems. The fourth area (left area) focuses on convenience and comfort. On

each row, there will be 6 problem spaces and one star space. The six problem spaces are divided into two pairs of three. Each of these pairs of threes are connected to one problem card that is turned upright for every player to see. If the player wants to exchange one of the problems for one of their own, they can discuss around the table and add thet instead. The first corner where the players start, shows a door and is called the garage. The second corner represents jail. The third corner represents a skateboard. The fourth corner represents the consumer agency.

2. Before the game begins, the players get a couple of minutes to look at the board and the face up problem cards.

3. The players move by hitting two six-sided dice. If they land on a problem space, the player will present a solution to the problem presented on the problem card that is laying face up in front of it, and stick a post-it note beside the problem card that summarizes the solution in one to three words. There are four different problem cards connected to the four areas on the board.

4. If a player lands on a star space, that player may pick up a star card and do what it says.

5. If a player lands on the skateboard, that player can put their character anywhere on the board, and play that round as if they landed there.

6. If a player lands on the consumer agency, they will be sent to jail, and have to skip their next turn.

7. If a player lands on a spot where a solution has already been presented, thay have two choices. They can either come up with something to improve the solution (add-on) and stick a post it note beside it with the idea. Alternatively, the player can challenge the solution, or one of the add-on cards (can only be two at a time per solution). If so, the players get one minute each to convince the other players that their idea should stay. Afterwards, the other players vote on which one wins. If the challenger wins, they swap the loser's idea for their own, and receive the money earned from the player who lost (if they don't have enough, take the rest from the bank).

8. Sparkles (Sp) are given like this:

   Add-on - 300 Sp (Can only be played when there is a solution already played)

   New solution - 600 Sp

   Going past the garage - 200 Sp

9. Sparkles (Sp) are used like this:

For 1500 Sp, a player can buy a promotion. They then take a promotion card and get some benefits for the rest of the game. When a player buys a second promotion card, they keep the benefits from the first promotion. The game is over when they buy their third promotion for 1000 Sp and become CEO.

Progression mechanics:

The currency system that is explained in the rule mechanics are there to give the players a sense of progression by getting more sparkles the better they play. The promotions are also included to give the players a sense of progression. The option to challenge other people's suggestions is there to discourage the participants from putting forward lackluster suggestions and focus more on the quality. The challenge option is also there so players always have a chance to turn the game around so they don't feel stuck.

Dynamics

As mentioned in chapter 2.2.1, individual games can lead to undesirable outcomes as players may conspire, cheat and bluff. By introducing a system where points (sparkles) are partly dependent on votes from other players, the desire is that this problem will be negated. The desire is also that the participants that come up with good ideas would do better than those who do not. The voting system is in the game to ensure this as well. In every game, there will also be a moderator present that can stop a participant's answer if it is too unrealistic.

Emotions

Lastly, the game is also developed with the emotion aspect from the MDE framework in mind. The main desired range of emotions that will stem from playing Ventures & Unicorns, are feelings of accomplishment from getting sparkles and getting promotions, urgency from the time limits and other players' advancement, disappointment from losing sparkles, excitement from the unknown variables in the form of dice and face-down cards, and enjoyment from humorous star cards.
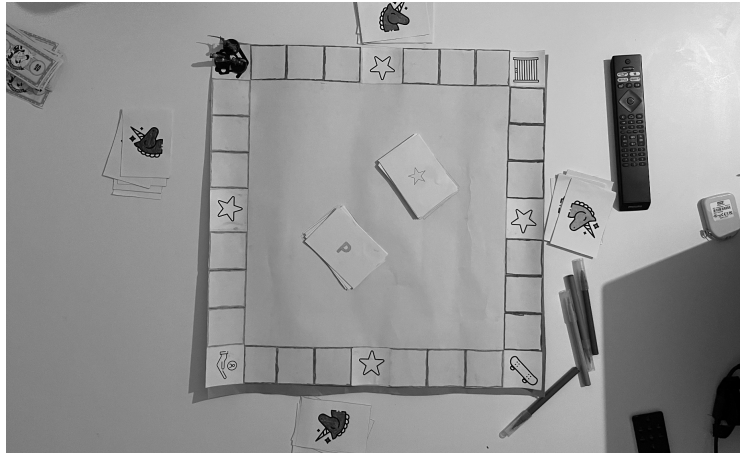
Figure 4, Final version Ventures & Unicorns

The gamification workshops lasted 1,5 - 2,5 hours with the following schedule and duration: a) Pre-workshop interviews 5 - 15 minutes b) Setup and instructions 20 minutes c) playing the game; identifying problems, generating ideas, giving feedback etc. 60 - 120 minutes d) Post-workshop interviews with participants 10 - 20 minutes. The time differences between the workshops does not result from different rules or any other design elements that could have had such an effect. It is rather a result that to some degree was dependent on the outcomes of random game elements (such as star cards), and the intensity with which the participants played the game. The first and last part of the process was naturally affected by how long the individual participants took to answer the interview questions.

The authors created, organized, and led all the consequent gamification workshops by acting as GM's (game master) and analysts. The role of the GM was to present the rules of Ventures & Unicorns, as well as to encourage participants to actively engage in the meetings to facilitate and provide structure in each session. The responsibility of the analysts was to collect data through interviews during and after each meeting. However, the researchers did not have any influence upon the participants' individual thoughts during the interviews and only intervened upon request or if a rule was broken.

After the workshops and interviews were completed, the data was transcribed and coded as can be seen in the transcription protocol, in the appendix. The transcribed data was thereupon closely revised and put in plain text so as to highlight the differing experiences and views that resulted from the workshops, as can be seen in chapter 4. In the analysis that follows, in chapter 5, the findings that resulted from the workshops are compared and analyzed together

with the previous literature from chapter 2. The result of the analysis, and the paper as a whole, is then presented in chapter 6 where the conclusions drawn from the study are presented along with the managerial implications as well as our limitations and recommendations for future research.

3.3 Literature selection

After having formulated a research topic, the literature search began with a review of the most cited peer-reviewed articles in regard to gamification and its potential use in relation to innovation in general. The search platforms that were mostly used were LubSearch and Google Scholar. Bryman et al., (2019) highlight three questions to ask when using literature from the internet: Who is the author, what type of website is it, and how recently was the page updated? Therefore, well known and newer sources were often chosen over lesser known, older ones when the possibility of choice was given. Bryman et al., (2019) describes that it's not seldom that a large amount of research has been done on a specific area within a subject, but that there is limited research when it comes to certain angles. This research paper is no exception, and thus, after having gathered a rather broad collection of articles, the collection of articles were narrowed down further in order to more specifically find information that addressed gamification in combination with the ideation part of innovation, although this turned out to be rather difficult since there turned to be somewhat of an information gap when trying to find literature that combine the two.

Nonetheless, this increasingly narrower search process was conducted by looking at the sources which had been used by the original authors of the literature in the above-mentioned, "broad collection" of articles, and then getting more narrow and specific with the search queries as more relevant information emerged. These sources were then examined and revised, and the most relevant and reliable ones were chosen. After having done this, we had gained access to relevant knowledge within the subject, about things like who the most prominent authors were, what suggestions there were regarding future research, and what type of terminology that's usually used to best describe the things that we were actually looking for. This allowed us to make further, more specific and relevant search inquiries which allowed us to find even more relevant articles that were of use.

As a whole, the search for appropriate literature was an iterative process that not only included the subject "gamification in ideation" but also gamification by itself as well as ideation by itself. Connections could then be drawn between the two, as it was discovered that most of the previous research surrounding "gamification in ideation" is rather lacking in both quantity and quality. The process of going through sources of this type went on all through the writing process, and finally resulted in a single research question of which the literature collected would fit in with the research design, and that it could be satisfactorily analyzed in combination with the findings from the data collection.

This way of going through potential sources made the essay writing easier, as the material which would be worked with was made clear. It also lowered the risk of choosing topics that were of low relevance, or on the contrary, that had already been researched to exhaustive extents (Bryman et al., 2019).

3.4 Research sample

When choosing participants for the study, a diverse group of people who had personal experience and knowledge in the subject area were carefully selected. They were chosen deliberately to ensure they could provide valuable insights and information based on their own experiences. In order to gain access to this data, the questions asked were directly related to the subject of the study that had been deemed relevant and applicable when it comes to answering the research question presented in 1.2 (Jacobsen, 2002). As the participants were not chosen on random basis, nor were they selected solely on basis of convenience, the sample process could be characterized as purposive in nature (Bryman et al., 2019).

While varied results would be obtained from different groups, this is seen as an opportunity to explore whether gamification has the potential to make varying contributions depending on the context and individuals involved.

In order to make it easier for the reader to follow the conclusions that are drawn based on the backgrounds of the participants, the participants have been categorized by the three workshop groups that they participated in (A, B, C). The selection of people for this study includes: i) People who have worked with ideation previously in a more professional and structured setting, i.e. VentureLab (Group A). As well as ii) students who are, or have been engaged in the creation of a new project or venture (Group B & C). The common denominator between

all participants however, is that they currently are or previously have been interested in starting a new business venture, i.e. nascent entrepreneurs. This is crucial as engagement only can be attained when the participants are genuinely inspired and fully absorbed in the task (Dale, 2014).

In terms of ideation, nascent entrepreneurs are particularly well-suited as a sample for this project. They are in the process of starting a new business, which means they are actively engaged in the ideation process. This makes them valuable sources of information and insights related to the topic. Van Osnabrugge and Jansen (2006) found that nascent entrepreneurs, or those in the early stages of starting a business, were more likely to engage in activities related to idea generation and problem solving, such as seeking out new information and experimenting with different approaches, compared to established entrepreneurs or non-entrepreneurs. This suggests that nascent entrepreneurs may be particularly inclined to generate ideas and solve problems. In addition to the proactive and resourceful nature of entrepreneurship, research has shown that entrepreneurial individuals tend to possess certain personality traits, such as creativity, risk-taking, and self-confidence (Timmons, 1999), which can help them generate ideas and solve problems effectively.

The interviewees have different academic backgrounds, including different levels of education and fields of study. However, all of them are current or former university students. This was ensured by design, as the authors of this paper deemed it to be an appropriate constant factor that would allow the study not to yield too varying results. It was also thought that the university affiliation would ensure that the participants would have some kind of previous experience of either conducting or participating in studies of similar type, which would allow the study to be conducted more fluidly. It was also thought that their "belonging" to various fields of expertise in knowledge-intensive academic institutions could result in them being able to bring more nuance to the table, as they've studied a number of different subjects in various sectors.

In addition to being nascent entrepreneurs, the participants from VentureLab were also selected on the basis that they coach students day-to-day in generating and developing ideas (Venturelab, 2022). Consequently, the incubator was chosen for two other key reasons: First, the incubators interest in the implementation of gamification strategies, and their ability to mobilize individuals who's more likely interested in taking part in a variety of activities like

gamified workshops and interviews; second, the incubator's intention to find new ways to improve entrepreneurs abilities to ideate. After meeting with one of the representatives they agreed to try and rally a number of innovation developers through their common channels. They were given a concise rundown of what the experiment would entail, along with reasons for why this might be in their interest and how it would help in the project.

3.5 Data collection

In this study, semi-structured interviews were conducted to gather data that would be comparable to the literature on which this study is based on. To ensure that these interviews were conducted effectively, an interview guide was created, based on the recommendations of Bryman et al., (2019). This guide was centered around three main outcomes: hedonic (e.g., playfulness and enjoyment) (Cardador et al., 2017), utilitarian (e.g., usefulness and cognitive) (Gatautis et al., 2016), and social outcome dimensions (e.g., recognition) (Hamari and Koivisto, 2015). These outcomes are crucial to understanding the motivations behind using gamification and guide the reader throughout the paper.

To collect the data, face-to-face interviews were conducted with participants before and after each workshop. This made it possible to not only analyze their verbal responses, but also their body language. Additionally, the interviews were recorded in order to transcribe them later, rather than taking notes by hand. This helped to ensure that the interviews flowed smoothly and minimized disruptions. All participants consented to being recorded for the duration of their interview. To minimize the "contextualization effect", the impact that the environment can have on the outcome of the interviews (Jacobsen, 2002), participants were asked if they were comfortable with the proposed setting or if they would prefer a different location.

The questions asked were open-ended, allowing participants to answer in their own words. Follow up questions were also asked if needed, either to clarify a response or to encourage more detail. No leading or misleading questions were asked, and the criteria for effective interviewing outlined by Kvale (1996) were followed, such as giving participants time to think and finish their answers and clarifying and summarizing responses as needed.

3.5.1 Interview guide

An interview guide, also known as a semi-structured interview, is a method used to collect data from a subject. According to Bryman & Bell (2019), this type of interview involves asking questions that are relevant to specific areas of the subject's expertise, in order to gather information that aligns with the research goals of the interviewer. The questions are semi-structured, meaning that they are not entirely predetermined, but rather allow for some flexibility and improvisation during the interview. This approach enables the interviewer to delve deeper into certain areas of interest and gain a better understanding of the subject's perspective. The main reason for using an interview guide was that it would allow for a better structure whilst conducting the interviews, as well as that it made it easier for the authors to categorize the data that later on would be compared to literature that addresses the same subject. The interview guide that was used for this study is split up in two parts: (1) Pre-workshop & (2) Post-workshop. The purpose of the pre-workshop was to provide the authors and readers with a better understanding of the backgrounds and previous experiences of the interviewees in relation to gamification and ideation. The post-workshop phase was where the majority of information was gathered on the impact of game elements on the gamified experience compared to the interviewees' previous experiences. Through this process, the authors and readers were able to gain insights into how the use of game elements affected the overall experience.

Apart from splitting the interviews in two, the interview guide (both pre- & post-workshop) is structured to provide answers to questions within a certain set of research areas. As previously stated, this was done by categorizing the questions after the three "outcomes" that are central all through the paper; hedonic, (Cardador et al., 2017), utilitarian (Gatautis et al., 2016), and social outcome dimensions (Hamari and Koivisto, 2015).

Table 2. Interview guide

	Hedonic	Utilitarian	Social outcomes
Pre-workshop	In the process of generating ideas, have you struggled to stay motivated or focused? Have you experimented with non-traditional methods of ideation before to enhance the fun in the process?	How do you create and form ideas? What are some of the challenges with that?	In the ideation process, is it generally all by yourself or together with others? Do you wish there were better methods of collectively coming up with ideas? Any other thoughts or questions?
Post-workshop	How did you feel while playing Venture & Unicorns?	Did the gamification elements help you generate more and/or better ideas? If so, how? Were there any challenges or drawbacks to using gamification in the workshop? How could these be addressed in future workshops?	Were there any unexpected outcomes or impacts of using gamification in the workshop? Did you feel the game added any social element that you are not used to prior? Any additional comments?

3.6 Data analysis

After the completion of each interview, the transcription process of the interviews began with the help of the recordings which had been collected. All three authors of the paper were

active in the transcription process in order to even out the workload. The transcription was conducted to give the reader a better overview of the answers given by the interviewees, and also for the reason that it allows for easier categorization of information (Oats, 2006). It was also thought by the authors that adding the transcriptions to the appendix would give the study an extra layer of transparency that would allow the readers to better understand how the data was interpreted in the findings, and on what basis the discussion and conclusions were built upon.

The transcriptions were then analyzed using thematic analysis (Braun & Clarke, 2006). This method involves identifying and coding for recurring themes within the data. The authors identified themes through a deductive approach, starting with a close reading of the transcripts and noting any patterns or recurring ideas. These initial codes were then discussed and refined with the whole team until a final set of themes was agreed upon. Once the themes were identified, the authors organized the data within these themes and began to look for patterns and relationships within and between the themes. This process allowed the authors to better understand the experiences and perspectives of the interviewees and to identify any trends or commonalities within the data.

When analyzing data in a qualitative study, it is common for some of the collected data not to fit neatly into the predetermined categories based on past literature. This is a natural part of the process and can actually lead to the development of new theories. However, it is important to recognize that these kinds of studies with a relatively small sample group are not typically groundbreaking, and therefore any new insights should be approached with skepticism (Bryman et al., 2019). This paper will consider new potential outcomes of using gamification, but it is important to keep in mind that these findings should be carefully evaluated and not blindly accepted.

3.7 Reliability, validity & ethics

3.7.1 Reliability

For a study to be considered reliable, its results must be both trustworthy and easily understood, according to Jacobsen (2002). This can be ensured by comparing the results of similar studies and ensuring that they yield the same results. Additionally, if someone were to

replicate the study, they should also obtain the same results. In more specific terms, Bryman et al., (2019) divide reliability into *external reliability,* which refers to the ability to replicate the study and obtain the same results, *and internal reliability*, which refers to the agreement among the researchers on how to handle and interpret the collected data.

External reliability may be difficult to demonstrate in this study due to the lack of previous research on this specific subject and the limited time available to conduct the study. Gamification, particularly in relation to ideation, has only been studied for a few years and new approaches to the subject continue to emerge. While there are some studies that use similar methods to this one, they have different goals and cannot be directly compared to this study. To address issues of trustworthiness and readability, the interview questions were based on existing literature and a comprehensive interview guide was created to ensure that the answers to the question in the interviews were relevant to the research topic and consistent with previous work on the subject. All interviews were also recorded and transcribed as accurately as possible to minimize the risk of corrupting the data, which could affect the reliability of the study (Bryman et al., 2019).

To meet the requirements of internal reliability, as defined by Bryman et al., (2019), all three authors of this paper were present at every interview and workshop and had access to the recorded material. A consensus was also reached on how to analyze the data through open discussion with a focus on avoiding misunderstandings or misinterpretations of the data.

3.7.2 Validity

Jacobsen (2002) states that validity is concerned with the relationship between the collected data and its truthfulness. Like reliability, validity can be divided into *internal* and *external validity.*

Internal validity refers to the validity of the collected results and the importance of *intersubjectivity*. Intersubjectivity means that for information to be considered correct and truthful, more than one person must agree on its meaning, which was purposely established between the researchers of this paper (Jacobsen, 2002). Furthermore, in order to examine the ideation process from various perspectives, the study includes participants with both academic and practical experience in launching ventures. By including individuals with

diverse backgrounds, the study can consider potential differences that may impact the discussion and conclusion, adding to the validity of the research.

External validity refers to the extent to which the results of a study can be generalized to other populations, settings, and time periods. It is concerned with the generalizability of the findings beyond the specific sample that was studied. In other words, external validity is the extent to which the results of a study can be applied to people, settings, and situations outside of the specific study. (Jacobsen, 2002). As mentioned above, the participants in this study have different backgrounds and reasons for wanting to ideate, which gives this study a better representation of the wider population, as people in general often do similar things for different reasons. This study does however have a rather small number of people participating, which will have a negative impact on the degree to which one could say that it meets a high standard of external validity.

3.7.3 Ethics

The study was conducted with ethical considerations and implications. One ethical principle that Bryman et al., (2019) mention is the physical and psychological safety of participants, which includes protecting their personal integrity. Therefore, measures to ensure that no confidentiality breaches occurred were implemented. To mitigate this risk of this happening, the participants are presented anonymously to protect their personal integrity and their companies (if applicable). Participants were provided with clear information about the purpose of the study and what was expected from them. This is in line with Bryman et al., (2019), who warn against *false pretenses*, where respondents are not given truthful information about the purpose of a study. Participants were informed about the purpose of the study and why they were chosen to participate. They were also told that they could request to have any statements they made removed from the protocol, to make them feel as comfortable as possible and avoid the risk of publicly making statements that they may not stand behind if taken out of context.

To ensure the accuracy of the depiction of the interactions within the scope of the study, the interviews were transcribed as closely to word-for-word as possible. To do this, the participants, who are all native Swedish speakers, were asked if they would be comfortable being interviewed in English. They all agreed, which made it possible to transcribe their

words without the risk of inadvertently altering them during the translation process. There may be some minor differences between the transcription and the actual interview if one were to listen to the recording. These differences are rare and only serve to make the interview easier to understand, such as when grammatical errors occur as a result of speaking English instead of Swedish. Changes were only made in cases where a sentence was deemed incomplete or where the meaning was heavily implied. These changes were made only to clarify the meaning and make it cohesive, and never to manipulate the content of the dialogue. Therefore, the information should not be seen as manipulated but rather "tuned up" into complete sentences on certain occasions. Finally, participants were given the option to receive a copy of the transcription and a copy of the finished paper upon completion of the study.

4 Presentation of empirical data

In the beginning of the chapter, every participant present in the workshops and interviews are briefly introduced. The participants are divided into three groups, A, B and C, depending on which workshop they partook in. Under the introduction, the data from the interviews collected from the workshop are presented. The data is divided into the three positive outcomes from using gamification. Hedonic (playfulness, enjoyable learning experiences, and engagement), Utilitarian (Cognitive, functional, creative problem-solving, time to action, utility, and usability), and Social (recognition, social influence, and self-esteem). (see chapter 2.2.1).

The word-for-word transcription of the interviews conducted may be found in table 3 of the appendix. Along the way, several key themes emerged that will be addressed in detail in the analysis section. Nine people have taken part in the three workshops and for their privacy, they will be presented anonymously.

Ps	Age	Background
A1	28	Bachelor in Economics and Manufacturing Technology and a master in Entrepreneurship & Business Design from Chalmers. Currently an Innovation Developer at Venture Lab - coaching students and researchers with their ideas. Has worked with non traditional methods for ideation before to enhance the fun in the process. Usually work with ideation in a group setting. Come up with ideas by starting with a problem and having brainstorming sessions.
A2	28	Have studied biomedicine. Currently an Innovation Developer at Venture Lab - coaching students and researchers with their ideas. Has not worked with non traditional methods for ideation before to enhance the fun in the process. Usually does not work with ideation in a group setting. People who come to him/her usually come up with their ideas by brainstorming by themselves.

A3 29 Bachelor's degree in business development and a Masters in entrepreneurship, and social change. Currently an Innovation Developer at Venture Lab - coaching students and researchers with their ideas. Has not worked with non traditional methods for ideation before to enhance the fun in the process. Usually does not work with ideation in a group setting. Comes up with ideas by thinking outside the box about what has not been done before.

B1 27 Bachelor's degree in informatics (systems' science). Test Engineer at a software company in Lund. Has thought about starting a clothing brand as well as a consulting firm. Has worked with non traditional methods for ideation before to enhance the fun in the process. Usually does not work with ideation in a group setting. Comes up with ideas by starting with a problem and then brainstorm.

B2 20 Studying international business with focus on Entrepreneurship and Innovation. Has not worked with non traditional methods for ideation before to enhance the fun in the process. Usually does not work with ideation in a group setting. Comes up with ideas by examining a specific market and trying to find areas of improvement.

B3 26 Studying law & business administration as well as political science. Working as procurement administrator at European Spallation Source ERIC. Has a software company that's on hold for the moment and has thoughts about starting a consulting firm. Has not worked with non traditional methods for ideation before to enhance the fun in the process. Usually does work with ideation in a group setting. Comes up with ideas by looking at personal past experiences and finding areas of improvement.

C1 23 Studying law. In the process of starting a consulting firm for high school students. Has not worked with non traditional methods for ideation before to enhance the fun in the process. Usually does not work with ideation in a group setting. Comes up with ideas by starting with a problem and then brainstorm.

C2	24	Master's degree in engineering. In the process of starting a crowdfunding platform. Has not worked with non traditional methods for ideation before to enhance the fun in the process. Usually does not work with ideation in a group setting. Comes up with ideas by starting with a problem and then brainstorm.
C3	23	Bachelor's degree in economics. In the process of starting a trading firm. Has worked with non traditional methods for ideation before to enhance the fun in the process. Usually does not work with ideation in a group setting. Formulates ideas by starting with a problem and then brainstorming.

4.1 Hedonic outcomes

The data collected from the study suggests that ideation can be a challenging process for some individuals, particularly when they face obstacles or negative feedback on their ideas. This is particularly true for those who are new to the process of ideation, as they may become demotivated when they realize the challenges and risks involved. Some participants reported struggling to stay motivated or focused during the ideation process, while others found it difficult to come up with ideas on the spot. B3 stated, "sometimes you lose sight of the ball. You forget what the core of the idea is and what you're trying to do. You may start on pathways that might sound interesting but might not be as feasible in relation to the original idea". C3 stated, "I have struggled to stay motivated and focused on the process of systematically finding solutions to complex problems." B2 stated, "when I have tried to focus on ideation, it's fairly hard to come up with ideas on the spot."

However, the data also suggests that there are individuals who can generate ideas relatively easily, even in the absence of structured ideation methods or techniques. These individuals may be more motivated and focused, or they may simply be more comfortable with the ideation process. Everyone from VentureLab were examples of this. For example, when asked about the challenges of staying motivated during ideation, A1 stated that, "In the beginning it's easy to stay focused as everyone is excited about their new project. But when you understand what is required to get started or when they face their first challenges, they often get demotivated. A2 stated, "I would not say that I am a person with my own ideas, and no, no real struggles. I think I'm quite good when I have ideas to just try them out." A3

stated, "No not myself, but I guess I've seen others struggle with motivation." Besides the participants from Venture Lab, only C1 found that he/she did not have a problem staying motivated during the ideation process by stating when asked, "Not really. I most often come up with ideas when I'm in a relaxed state of mind, running, sauna or before bed."

Before the game, some participants reported experimenting with non-traditional methods of ideation in order to enhance the fun and creativity of the process. These methods included theme-based workshops, mind maps, and gamification. A1 stated "We mostly conduct theme-based workshops where participants are brainstorming different ideas. Afterwards we do a NABC on the chosen problem or solution." B1 stated, "Ehh, the furthest I've ever gone is like mind maps but nothing else." C3 stated, "I've tried charade games where you are expected to take the role of a person and find solutions to problems those persons can face." It is worth noting that some participants, like A1 and B1, reported that these methods helped to boost their creativity and motivation, while one participant, as seen with participant C3, did not find them particularly effective.

After playing the ideation board game "Ventures & Unicorns," the data suggests that the use of gamification had a positive impact on the ideation experiences for all the participants. All participants reported enjoying the game and having fun while playing it. For example, A1 stated "It was fun! It generated more ideas than I thought." B2 stated that he/she felt, "Delighted, enthusiastic, superb, energized and stimulated." C2 commented "The gamification elements helped me generate more and better ideas. It was fun to come up with creative solutions to the problems presented in the game, and I found myself thinking more outside the box than I usually do."

Highlighting the competitive nature of the game, the participants had mixed feelings. For example, A2 stated, "It felt like a very competitive game, which was both good and bad. It makes the game fun, but it could derail you from the purpose of the game. I noticed that I sometimes thought more about winning, than just coming up with good ideas." B2 commented, "Competing against others challenged me to come up with more innovative ideas on a short timeline."

4.2 Utilitarian outcomes

Data collected during the semi-structured interviews showed that many of the participants had different methods of coming up with ideas. These methods include starting with a problem, examining personal experiences, and researching specific markets. A1 stated, "Mostly from the different sessions we do here at Venture Lab by starting with potential problems that we see in our everyday life." B2 stated, "I would say the way I formulate ideas usually comes from analyzing a certain market and looking at if there is anything I can improve within that market or category". C3 stated, "I typically create and form ideas by brainstorming, researching, and taking inspiration from other sources." B3 stated, "when we come up with ideas that could be useful, we've been looking at mostly our past experiences."

Most of the participants reported that the board game was helpful in generating new ideas and stimulating creativity. For example, participant A1 stated, "It generated more ideas than I thought. I thought a lot of the cards offered insight into potential challenges that could be further developed." B3 stated, "I thought it was a fun game and it really pushes you to think about your ideas, flesh out your ideas and make them make sense to your competitors." A3 stated, "usually when it comes to ideation, I think when in a group, you don't want to feel like... I mean you want to make the ideas better, but you also don't want to make the other people feel bad by criticizing their ideas. But here it is a game, so it's kind of the point, and it makes it easier to challenge others' ideas without making them feel bad or going against them."

There were however participants who did not think the game helped them create better ideas. These were participants A2, and to some degree A1. A2 stated, "I noticed that our ideas were not that unique, kind of low hanging fruit. Many of the ideas were very broad. I believe that every idea would need a challenge, like "what would you do in this economy". A1 stated, "One thing that we didn't have in the game, compared to our previous ideation workshops, we were not given the opportunity to co-develop the ideas with the other participants. The competitive nature of the game for sure made it more fun to ideate, but it could be good to have some type of discussion in the middle of the game to harness the power of collaboration."

There were also some other areas for improvement identified in the feedback. These included

a short time limit, the ability to downvote a proposal indefinitely and focusing more on winning than generating ideas. A1 stated, "I felt like the minute you got to come up with a valid solution to the problems could be quite challenging. It depends on what results you are expecting but, in some cases, there wasn't enough time to think of a great idea." B1 stated, "So I think like, if you would use it in more of a company setting or professional setting, I think that some people and their proposals could be pretty downvoted. So, I think it might be good to make rules about how much you can down-vote people." Participant C3 stated, "One challenge with using gamification in the workshop was that some players may have been more competitive or focused on winning than on generating ideas."

Another suggestion for improvement was to provide more in-depth explanations or instructions on how to play the game and use the various components. A few participants mentioned that they had some initial confusion about the rules and objectives of the game, which could potentially have impacted their ability to fully engage in the ideation process. Providing clearer instructions and guidance could help to ensure that all participants are able to fully understand and participate in the game. For example, A3 stated, "It would be good to have some printed rules maybe and some more clarification when it comes to which field of the board is which. I mean it was quite clear but like if you turn it into an actual board game in the future, I think that would be a good idea."

4.3 Social outcomes

Before having tried the game, two out of nine participants stated that they most often try to formulate their ideas together with others from the get-go. A1 stated, "Mainly in groups. It would be nice to have better methods, but also important to have something that doesn't take too much time or is too complicated." B3 stated, "Mostly in a group of people. You can come up with an idea by yourself, but in order to flesh out that idea, it helps to have that "back and forth" with someone to strengthen and validate the ideas." However, all participants did in some way, or another, say that they value the input of others and/or that they wish that they had better possibilities and/or ways to ideate together with others. For example, B2 stated, "It's almost always by myself and I mean, I do wish there were better methods for formulating group ideas, the only problem is that it is hard to trust anybody with your idea. But if there are people that I can trust, I would be open for a more collaborative ideation process." The most frequently mentioned benefit that might be gained from this is a fresh, or

several fresh perspectives as most of them recognize that one might be a bit biased when it comes to looking for possible negatives within one's own idea.

All the participants said that they enjoyed at least some of the collaboration aspects of the game. The positives brought up were that it is a good way for nascent entrepreneurs to get to know each other, it opens up for discussion, it makes it easier to criticize others' ideas, it made the participants try harder than usual and it helped to narrow down ideas. A1 stated, "I think it's a great way for nascent entrepreneurs that don't know each other so well to break the ice in a playful and relaxed manner within the ideation process." A2 stated, "I believe it is a great tool to open up discussions." A3 stated, "Yeah, I think that it really added a competitive aspect to it. When we have ideation it's usually not really… You don't compete against anyone, you just compete against yourself like trying to improve your idea and you don't really challenge anyone, like I said before because you don't want to make anyone else feel bad. It's not the point of ideation to put down others but to create, here however you can still improve on each other's ideas without making each other feel bad. This is because, you know, it's a game, it's fun… so that is probably the best aspect of it. There really is something in it that I haven't experienced before. It is challenging and more competitive when I compare it to what I am used to. And that also pushes yourself to be better than the others, in a whole other way than you usually do when it comes to ideation." B1 stated, "Yeah, I think it made me try harder to be more creative, even though it was really hard at times. I do also think that if you've played it a couple of times it would get easier to really get the mind flowing. But I think that it helped with mindfulness, like I mean to really get the mind thinking and to better react to stuff that happens within the confines of the game." B2 stated, "working with a group definitely allows you to narrow down your best ideas and throw out those that don't make any logical sense." C1 stated, "It was interesting to see how everyone's ideas meshed together and how we were able to build on each other's ideas to come up with even better solutions."

5 Analysis

In this chapter, the answers collected during the interviews are analyzed with the help of the theories from chapter 2.

Just as the falling blocks in Tetris can be manipulated and rearranged to create different patterns and shapes, the use of gamification can help entrepreneurs rearrange their ideas to create new and innovative solutions. The use of gamification was found to enhance the ideation process, particularly for those individuals who struggle to stay motivated or focused, making it more interactive and enjoyable for participants and helping to keep them motivated and focused. This aligns with previous research on the positive effects of gamification on motivation and engagement (Hamari et al., 2014). In addition, it appears that the ideation experiences of the study's participants were influenced by a combination of domain-relevant knowledge, creative-thinking skills, and intrinsic task motivation (Amabile, 1996).

5.1 Hedonic perspective

Intrinsic task motivation is defined as the doing of an activity for its inherent satisfaction rather than for some separable consequence (Amabile, 1996). A link between the hedonic outcomes (enjoyment and similar feelings) and Intrinsic task motivation can therefore be observed. Some participants reported struggling to stay motivated or focused during the ideation process while using traditional methods of ideation eg. brainstorming, mind mapping etc., while others found it easy to generate ideas. The use of gamification seemed to have a positive impact on the intrinsic task motivation of many participants, with all of the participants stating that it made the process more enjoyable and engaging, and helped them to stay motivated and focused.

By analyzing the data collected from the semi-structured interviews, a conclusion can be drawn that gamification has a strong positive correlation with intrinsic task motivation. This, however, had a negative application for some of the participants, as hypothesized in chapter 2.3, where the proposition states that gamification may have negative effects on the quality of the ideas generated (Hamari et al., 2015), as the entrepreneur may be persuaded to generate a magnitude of low grade ideas in order to accrue points and win the game, instead of

generating a few but high-quality ones. This was observed to be a problem for some of the participants, and most notably for one, as he/she was dissatisfied with the solutions that was presented by another player, and was saying that the ideas in question were not feasible to even the slightest extent. It is worth noting however, that some of the participants came to the opposite conclusion where they stated that they were more focused than usual and experienced that they came up with ideas of higher quality in a shorter time window than they otherwise would. It is possible however, that the engagement and focus some of the participants felt did not solely come from playing the game, but from the setting the games were played, and the authors of this study. The designated game master (one of the authors), encouraged the participants during the games and this could potentially have influenced their experience.

This leads to the observation that Ventures & Unicorns, as well as gamification in general, can make the process of ideation more enjoyable. This could lead to nascent entrepreneurs putting more time and effort into the ideation process, resulting in a more focused and engaged approach. However, it is also possible that the ideas generated through this method may be of lower quality compared to those generated through traditional ideation methods, as they may be more surface level in nature. On the other hand, analyzing the quality of ideas generated through Ventures and Unicorns or other forms of gamification can be difficult, as it is subjective and dependent on the specific goals and needs of the individual. Some ideas may be deemed of higher quality due to their potential for success in the market, while others may be considered more valuable due to their originality or the problems they aim to solve. Additionally, the quality of an idea may not be fully realized until it is developed and implemented, making it difficult to accurately assess the value of an idea in the early stages of ideation.

5.2 Utilitarian perspective

In terms of domain-relevant knowledge, which is a central component in ideation (Amabile, 1996), some participants mentioned that they typically start the ideation process by identifying a specific problem, or untapped potential within a certain market, suggesting that they have a good understanding of their field and are able to apply that knowledge to generate ideas. This aligns with what is said by Baron (2006), who states that prior expertise is one of five factors that influences an entrepreneur's ability to identify opportunities. It is clear that

domain-relevant knowledge played an important role for some players in regards to how effectively and successfully they played the board game in the workshop. Those who had previous experience with ideation in a semi-structured setting, such as the VentureLab employees, seemed to particularly benefit from the game and were able to more effectively generate a wider set of solutions to the presented problems when put in comparison to those who had never done anything even remotely similar before.

Others mentioned that the use of research and inspiration from external sources was a way for them to generate new ideas, and one participant said that he/she often communicates with friends and acquaintances who's active in other fields than his/her own in order to gain insight and to see if any business opportunities may exist in places that are perhaps more seldomly looked at. This also corresponds with what's suggested by Baron (2006), where he presents knowledge and expertise as one of his five factors that leads to opportunity identification.

Creative-thinking skills is also a component in the ideation process. Some participants mentioned that they struggled to come up with ideas on the spot, while others found it relatively easy and stated that the game helped them to think outside the box and narrow down their ideas. In a similar manner, the use of non-traditional methods, such as theme-based workshops and creative visualization techniques, seemed to have a mixed effect on the participants' creative-thinking skills, with some finding them helpful and others not. This may be due to differences in their inherent creative-thinking skills and personal ability to generate ideas under pressure. However, in the cases where participants found it easy to come up with ideas as a result of playing the game, one could make the case that this aligns with what is said by Gatautis et al., (2016), where they state that gamification may result in faster time-to-action as well as better creative problem-solving. As some participants had positive experiences while others didn't, this points to the possibility that external factors indeed play an important role when it comes to the potential outcomes that gamification may have on participants when implemented to stimulate ideation, specifically in regard to creative thinking as well as time-to-action. The participants who stated that the game didn't stimulate their forming of new ideas both had previous experience with different forms of ideation as it is a part of their everyday work, which could possibly explain their skepticism. It could be that because they have a broader knowledge base in terms of other ideation methods that may have worked better for them in previous, similar situations, that they more actively compared

their new found experience to previous ones. However this cannot be concluded, as the data is not specific enough to allow for a deduction that points to this fact as the sole reason for their diverging experiences of the game in relation to the rest of the participants.

Overall, the feedback suggests that the board game was successful in stimulating creativity and facilitating ideation for the participants, but there are also opportunities for improvement to the game by examining the time limits, the voting system, and providing clearer instructions and guidance. A stronger focus on idea generation without taking away the fun aspects could also be an option. Incorporating these suggestions could help to further optimize the game and enhance its effectiveness in the ideation process for nascent entrepreneurs.

5.3 Social perspective

The findings would suggest that gamification may have a positive effect on participants in terms of self-esteem and social influence, at least when applied to the ideation process. This corresponds with what Hamari and Koivisto (2015) suggests when speaking of the social implications that may result from the implementation of gamification. A rather fitting example of this was when a participant who had had extensive experience concerning the subject, said that this type of game made it a lot easier to give constructive criticism without feeling like they were imposing their own ideas or being too critical. The participant also mentioned that the game helped to level the playing field and allowed for more equal participation and contribution from all members of the group.

Collaboration was seen as beneficial for the ideation process, as it allowed for the input of fresh perspectives and the validation of ideas. This aligns with Ideation theory, which posits that individuals are more likely to come up with creative ideas when they have domain-relevant knowledge and the opportunity to engage in collaborative thinking (Amabile, 1996). Collaboration was also seen as a way for nascent entrepreneurs to get to know each other and build trust, which is important for the opportunity recognition process according to Opportunity recognition theory (Baron, 2006). This theory suggests that individuals are more likely to identify business opportunities when they have strong network connections and the ability to collaborate with others.

On one hand, the competitive aspect of gamification was shown to increase motivation and engagement, as found by Deterding et al. (2011). As a result, participants tried harder to be more creative in order to win. This same competitive aspect led to negative outcomes, where one participant stated that the competitive aspects of the game could "kill" others' ideas in order to win, rather than focusing on developing the best ideas. This negative outcome may be dependent on the personality traits of each participant (Baron, 2006), as mentioned by a participant "But here it is a game, so it's kind of the point, and it makes it easier to challenge others' ideas without making them feel bad or going against them". In addition, these findings align with Brown's (2020) discoveries, who also found that the use of gamification may have a negative effect on the quality of ideas generated, though this was dependent on the specific goals and needs of the individual. In contrast, Cheng and Chen (2018) found that the use of gamification in the ideation process can lead to the generation of more novel and original ideas, which was the case for some of the participants in the study. Overall, it appears that the effects of gamification on the ideation process may be mixed, with the potential for both positive and negative impacts depending on the specific context and goals of the individual. In summary, the effectiveness of gamification in the ideation process depends on how it is designed and implemented, and it is important to consider both the potential benefits and potential drawbacks when using this tool.

5.4 Forth outcome emerges

According to participant A1, the cards used in the gamification process offered insight into potential challenges that could be further developed. Participant C1 commented on the unexpected outcomes of the game "I learned a few things, specifically from devastating stats presented by the challenge cards. On top of that, you get different perspectives from the other players that in some of the cases was enlightening for me". Participant A1 also noted that the wide range of problems and topics covered in the game were relatable and easy to come up with solutions for.

In addition to the established outcomes of utilitarian, social, and hedonic, the study suggests that a fourth outcome, knowledge and understanding, may emerge as a result of the gamification process. The comments from participants suggest that the use of gamification helped them to better understand the problems and challenges being addressed, as well as the potential solutions that could be developed. This aligns with the findings of improved

learning by Kim & Kim (2019), which found that gamification can be an effective tool for enhancing learning and knowledge acquisition.

One of the key benefits of gamification in this context is that it allows for the exploration of complex issues in a fun and engaging environment. As participant B3 noted, it can be challenging to fully understand the nuances of a problem, especially when working on it in isolation. By working through challenges in a group setting and receiving feedback from other players, participants may be able to gain a more holistic understanding of the problem and potential solutions.

Taken together, these findings suggest that the benefit of gamification in the ideation process goes beyond simply increasing motivation and engagement. Gamification not only fosters ideas, but can also improve learning and understanding in a variety of domains at the same time.

6 Conclusion

In this chapter, the conclusions drawn from the analysis are presented. First, the theoretical contributions are discussed, then the managerial implications and lastly the limitations and future research in 6.3.

6.1 Theoretical conclusions

The study adds to the existing literature on gamification and ideation by exploring the impact of gamification on the ideation process for nascent entrepreneurs. The findings suggest that gamification can be an effective method for enhancing the ideation process, particularly for individuals who struggle to stay motivated or focused. This aligns with previous research on the positive effects of gamification on motivation and engagement. However, the data also suggests that the effectiveness of gamification may vary across different entrepreneurial contexts and individuals, highlighting the importance of considering the individual characteristics and needs of entrepreneurs when using gamification for ideation.

When comparing our findings with the hypotheses, it is suggested that gamification can have both positive and negative effects on the ideation process for nascent entrepreneurs. On the positive side, gamification was found to increase the quantity and for a majority, the quality of ideas generated, as well as intrinsic task motivation and engagement. This aligns with the hypotheses that gamification has the potential to positively impact the ideation process by increasing the use of domain-relevant knowledge and creative-thinking skills, leading to more novel and useful ideas. However, our findings showed that gamification actually led to a range of diverse ideas, contrary to the proposition that it may result in a narrow focus on certain types of ideas. Additionally, our findings showed that gamification can create negative consequences, such as increased competition and pressure among entrepreneurs.

To further understand the impact of gamification on ideation, the study employed the MDE-framework (mechanics, dynamics, emotions) to provide insight into how gamification can be used effectively. The mechanics of gamification, such as game rules and rewards, can help to structure the ideation process and provide a sense of progress and accomplishment. The dynamics of gamification, such as social interaction and competition, can foster

collaboration and enhance motivation. The emotions evoked by gamification, such as enjoyment and flow, can facilitate creativity and idea generation.

The use of gamification in the ideation process has also been found to have several positive outcomes beyond simply increasing motivation and engagement. According to participant comments, the gamification process in this study helped participants to better understand the problems and challenges being addressed, as well as potential solutions. Gamification also allows for the exploration of complex issues in a fun and engaging way, and can improve learning and knowledge acquisition. In addition, working through challenges in a group setting and receiving feedback from other players may lead to a more holistic understanding of the problem and potential solutions. These findings suggest that gamification is a valuable tool in the ideation process for not only fostering ideas, but also improving learning and understanding.

In conclusion, the use of gamification in the ideation process can be a powerful tool for entrepreneurs looking to boost motivation, engagement, creativity and potentially learning. By considering the individual characteristics and needs of entrepreneurs, and by integrating gamification seamlessly into the ideation process, organizations can effectively use gamification to generate innovative ideas and drive successful outcomes. Gamification is a promising area of research that warrants further investigation, and the findings of this study provide a foundation for future research on the best practices for gamifying ideation and driving success in the entrepreneurial world.

6.2 Managerial implications

In terms of best practices for gamifying ideation, the study suggests that it is important to tailor gamification to the specific context and goals of the ideation process, and to consider the preferences and motivations of the participants. Gamification may not be effective for all individuals, and it is important to tailor the gamification approach to the specific context and goals of the ideation process, as well as the preferences and motivations of the participants. Gamification should also be integrated seamlessly into the ideation process, rather than being treated as an isolated activity. This can help to ensure that gamification is effective in enhancing the ideation process, rather than disrupting it. For example, by adopting gamification techniques, incubators and accelerators can tap into the natural competitive and

achievement-oriented drive of entrepreneurs to encourage them to find solutions to complex challenges. This can be especially effective in markets that the incubator or accelerator wishes to disrupt, as the gamification can create a sense of urgency and motivation for founders to come up with innovative solutions that can drive change in the industry.

6.3 Limitations and future research

There are several limitations to the study that should be considered when interpreting the findings. First, the study was conducted with a small sample of nascent entrepreneurs, which may not be representative of the larger population of entrepreneurs. Further research with a larger and more diverse sample of entrepreneurs is needed to strengthen the findings of this study.

Second, the impact of gamification on ideation was assessed through self-report measures, which may be influenced by biases such as social desirability bias. To more accurately evaluate the effects of gamification on ideation, it would be useful for future research to utilize objective measures, such as the number of ideas generated or the quality of the ideas. One way to assess the quality of ideas generated through gamification is to compare them to those generated through traditional ideation methods in terms of novelty, value, and feasibility, and to consider the sustainability of the ideas over time. By examining these factors, researchers can gain a deeper understanding of the potential benefits and limitations of using gamification for ideation, and help organizations to effectively leverage gamification as a tool for driving successful outcomes.

Third, the study only evaluated the short-term effects of gamification on ideation, and it is unknown whether these effects are sustained over time. To further understand the potential of gamification as a tool for enhancing ideation, it is necessary to conduct research on the long-term effects of gamification. This could involve examining how gamification impacts the implementation and success of generated ideas, as well as the motivation, engagement, and creativity of entrepreneurs over an extended period of time. Through this research, it will be possible to determine the sustained effectiveness of gamification on ideation and to identify strategies for maximizing the value of gamification in the entrepreneurial context.

Forth, the board game used in this study was developed specifically for this research because no existing gamification tool met the desired research objectives. The possible limitations

from creating a gamification tool, is that the game has not been tested to a desired extent and it can be seen as a quasi-experiment. It should also be mentioned that the authors do not have any prior experience in game development. This study attempts to minimize these limitations by going over prior theories on game development and gamification, taking inspiration from other games, as well as including participants who have worked with ideation before so that they can be compared with their prior experiences. Ventures and Unicorns has also gone through two test groups before implementation to search for desired and undesired outcomes.

Finally, a potential factor that may have influenced the level of engagement and focus of the participants in the study was the presence and encouragement of the designated Game Master, who was also one of the authors of the study. It is possible that this factor, in combination with the setting of the games, contributed to the participants' experience. It is important to consider the potential influence of these factors in the study.

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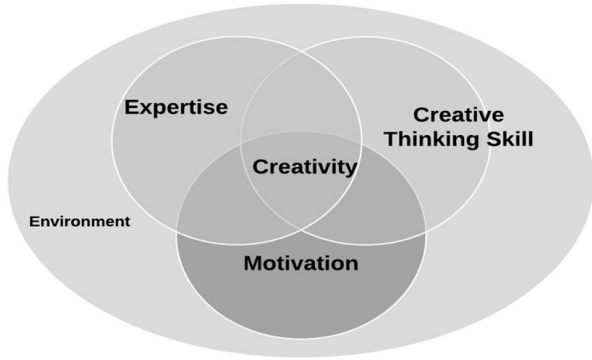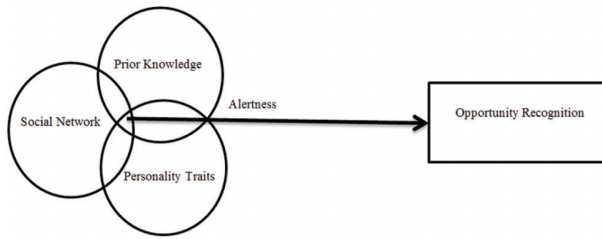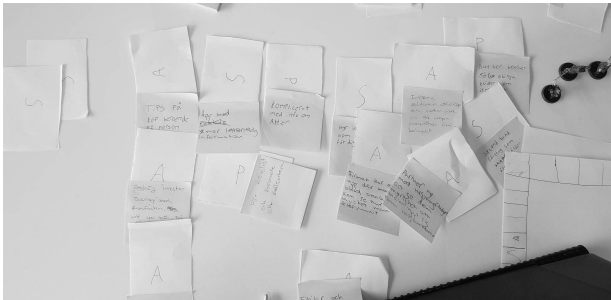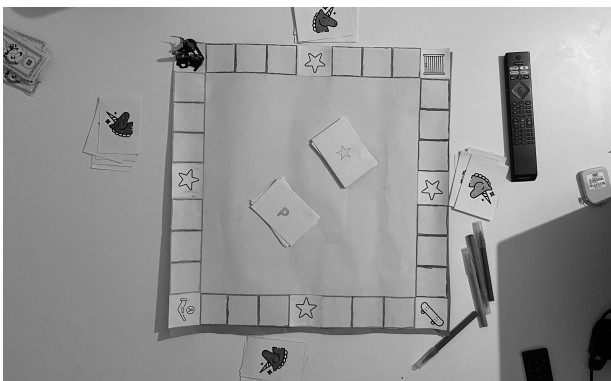
Appendix

Figure 1.

Figure 2.

Figure 3.

Figure 4.

Table 3.

Pre Workshop	Age and education
Participant A1	28 years old. Bachelor in Economics and Manufacturing Technology and a master in Entrepreneurship & Business Design from Chalmers. Currently an Innovation Developer at Venture Lab - coaching students and researchers with their ideas.
Participant A2	28 years old. Have studied biomedicine. Currently an Innovation Developer at Venture Lab - coaching students and researchers with their ideas.
Participant A3	29 years old. Bachelor's degree in business development and a Masters in entrepreneurship, and social change. Currently an Innovation Developer at Venture Lab - coaching students and researchers with their ideas.
Participant B1	27 years old. Bachelor's degree in informatics (systems' science). Test Engineer at a software company in Lund. Has thought about starting a clothing brand as well as a consulting firm
Participant B2	20 years old. Studying international business with focus on Entrepreneurship and Innovation.
Participant B3	26 years old. Studying law & business administration as well as political science. Working as procurement administrator at European Spallation Source ERIC. Has a software company that's on hold for the moment and has thoughts about starting a consulting firm.
Participant C1	23 years old. Studying law. In the process of starting a consulting firm for high school students.
Participant C2	24 years old. Studying engineering. In the process of starting a crowdfunding platform.
Participant C3	23 years old. Has studied economics. In the process of starting a trading firm.
	In the process of generating ideas, have you struggled to stay motivated or focused?
Participant A1	In the beginning it's easy to stay focused as everyone is excited about their new project. But when you understand what is required to get started or when they face their first challenges they often get demotivated. When you understand what it takes to bring the idea forward it can be quite hard to keep the motivation going. Also, as a student you have a lot of other things that you are involved with, which can be a distraction.

Participant A2	I would not say that I am a person with my own ideas, and no, no real struggles. I think I'm quite good when I have ideas to just try them out.
Participant A3	No not myself, but I guess I've seen others struggle with motivation. Usually when they have an idea for a project, they are often initially very motivated, but then they become less motivated when they realize that it's not that easy. Often, it's when they realize that just because an idea sound very good to them personally, it does not mean it sounds good to others. It's when they get someone else's perspective on their idea, and perhaps some negative feedback, it's a lot harder for people to stay motivated all by themselves.
Participant B1	I usually look around alot in google, googling around you know, and look for company ideas. And then I came up with a few ideas that I feel are like "sufficient", like when I was studying I was planning on going into solar panels, like going into sort of an import business for solar panels. I never started though because I lost interest after a while. I think it's like because it's too big of a risk to start a company and also because I lost motivation after a while.
Participant B2	Oh definitely I would say that idea generation is very random and comes out of nowhere, but when I have tried to focus on ideation, its fairly hard to come up with ideas on the spot.
Participant B3	I would not necessarily say unmotivated, but sometimes you lose sight of the ball. You forget what the core of the idea is and what you're trying to do. You may start on pathways that might sound interesting but might not be as feasible in relation to the original idea.
Participant C1	Not really. I most often come up with ideas when I'm in a relaxed state of mind, running, sauna or before bed.
Participant C2	I am an engineer by trade, and I often find that my training in logical and analytical thinking can be a double-edged sword when it comes to ideation. On one hand, it allows me to approach problems from a structured and systematic perspective. On the other hand, it can make it difficult for me to think outside the box and come up with truly creative solutions.
Participant C3	Yes, I have struggled to stay motivated and focused in the process of systematically finding solutions to complex problems. But ideas come in all shapes and forms so, ideas popping up in everyday situations isn't really a matter of motivation or focus.
	Have you experimented with non-traditional methods of ideation before to enhance the fun in the process?
Participant A1	We mostly conduct theme-based workshops where participants are brainstorming different ideas. Afterwards we do a NABC on the chosen problem or solution. In order to boost creativity, we do workshops where participants should come up with the most silly ideas possible,

	for example pitch the idea of a flying shoe. It's beneficial for practice pitching but also allows nascent entrepreneurs not take themselves too seriously.
Participant A2	Normally when we talk to students in the early stages, through ideation sessions, we use a NABC, brainstorm different problems. We go through the need part for 5 min, then focus on the problem, then go to the solution, and then we end up with something somewhat of a game. I know we have some board games, but I can't remember the games. We haven't put the time in to check it out.
Participant A3	Hmm, nah, no, I think I've just done it the regular or "standard" way.
Participant B1	Ehh, the furthest I've ever gone is like mind maps but nothing else. No recreational drugs or anything like that but I've read about it, hehe.
Participant B2	Well, nothing comes to mind as an alternate method for idea generation, usually the only thing I would do to spark ideas would be to just exercise to get my mind flowing, maybe a walk to stimulate creativity, but that's basically it.
Participant B3	Well no, not really. It can help make processes be more efficient by brainstorming ideas in a group tho.
Participant C1	I have not experimented with any non-traditional methods of ideation prior, not what I can think of at least.
Participant C2	I have not experimented with non-traditional methods of ideation before, but I am open to trying new things to enhance the fun in the process. I tend to approach problem-solving in a very linear and methodical way, and I think that incorporating more creative and spontaneous methods of ideation could be beneficial.
Participant C3	I've tried charade games where you are expected to take the role of a person and find solutions to problems those persons can face. Didn't feel it helped in creating ideas though.
	How do you create and form ideas? What are some of the challenges with that?
Participant A1	Mostly from the different sessions we do here at Venturelab by starting with potential problems that we see in our everyday life.
Participant A2	People usually come to me with their ideas that they have already brainstormed on their own. I would say that normally the problem I see is that the ideas are too broad, it's difficult to narrow them down, you want to solve all problems at once, and you can't see where to start.
Participant A3	I would try to think outside the box, I'd also try to think not only what my perception is but also to think about others perception. I would also try to see what ideas are out there and try to think about how mine is

	better or how it compares to others. So trying to improve… or to think more that… Just because my idea is good it does not mean that it can't be better. I try to think of it that way, always try to improve.
Participant B1	I look at problems, and I find that there are solutions missing in the market. And sometimes I try to talk with people within different professions in order to find out what they might be missing. Like an example, a friend of mine is working as a nurse, and he is working in a lot of different hospitals and he found that there is a severe lack of communication between different hospitals. It's like actually in the law that they cant be connected… but they really should be connected, or even better, run on the same system.
Participant B2	I would say the way I formulate ideas usually comes from analyzing a certain market and looking at if there is anything I can improve within that market or category. Other than that, I could not tell you.
Participant B3	In the past, when we come up with ideas that could be useful we've been looking at mostly our past experiences. Where we've been working earlier, what was inefficient etc. Just in general, what could be a solution to a problem we've experienced. The challenge I'd say sometimes is, you might have some insight from your perspective of the problem, but you don't actually have full insight about what the problem entails. So when you start working on something, you start getting a bit on the way, you might realize you're actually on the wrong path and not validated your idea enough.
Participant C1	That's a good question, I'm not sure I've reflected on that. I would say just being updated about what's happening in the world and problems related to certain areas or people are a huge inspiration. Additionally listening to podcasts, being out running and talking with people can help one create and form ideas.
Participant C2	I create and form ideas by brainstorming and working through potential solutions to a problem. One of the challenges I face is staying focused and not getting stuck in a rut of thinking about the same thing over and over. I find that it can be helpful to take regular breaks and to challenge myself to come up with a certain number of ideas within a set time frame.
Participant C3	I typically create and form ideas by brainstorming, researching, and taking inspiration from other sources. Some challenges with this process can include not having enough information or resources to fully develop an idea, or struggling to come up with original ideas.
	In the ideation process, is it generally all by yourself or together with others? Do you wish there were better methods of collectively coming up with ideas?
Participant A1	Mainly in groups. It would be nice to have better methods, but also important to have something that doesn't take too much time or is too

	complicated.
Participant A2	Most students that come in, come in individually with their own ideas, but I see that those that come in a group can talk with each other which is great and it's easier to go to the next step, so I would say I prefer the group setting.
Participant A3	I would say that... I try to get other people's perspectives on it and sometimes it's hard to maybe … there's not a good method to ideate in a big group. But I would be open to something like that, but usually I just try to go back and forth with people when talking about ideas, yeah.
Participant B1	Hmm, yeah i usually start with an idea by myself and then i think about it for a week or two. Then I usually speak with somebody about it, it goes on for a while, and then it dies. So it's like yeah. It would be nice to have another way to like.. get your idea going, like one idea where you could find somebody similar by typing in your idea somewhere and then get a match for someone who thinks in similar ways.
Participant B2	It's almost always by myself and I mean, I do wish there were better methods for formulating group ideas, the only problem is that it is hard to trust anybody with your idea. But if there are people that I can trust, I would be open for a more collaborative ideation process.
Participant B3	Mostly in a group of people. You can come up with an idea by yourself, but in order to flesh out that idea, it helps to have that "back and forth" with someone to strengthen and validate the ideas. I think collective ideation would be more efficient in terms of generating quality ideas.
Participant C1	Yeah, maybe it would be nice to find better methods of collectively coming up with ideas, as it can sometimes be difficult to get everyone on the same page.
Participant C2	In the ideation process, I usually work by myself. However, I have found that working with others can be beneficial as well. Collaborating with others can provide fresh perspectives and can help to generate more and better ideas.
Participant C3	In the ideation process, I usually work on my own, but I do enjoy collaborating with others and coming up with ideas together. I do think that there could be better methods of collectively coming up with ideas, such as using gamification or other interactive techniques.
	Any other thoughts or questions?
Participant A1	Nope.
Participant A2	I would say the part with the next step is important, sometimes people when they get into a creative mode, they are like "oh this is so cool, but what now?", like the part after ideation to get motivated to actually do

	something.
Participant A3	No, no, I'm just excited to try this out and to see what it's all about.
Participant B1	I guess I really want to have a good idea in the future and follow it through, it's like a plan of mine. I guess a lot of people don't prefer having an 08.00-17.00 job, I want to have the freedom of being my own boss. I think you can create a much stronger bond with what you're doing in life if you get to that point. It would also just be more fun, since you're working for yourself and for your own idea, especially if you think that you can improve on it and create something better than what's already out there.
Participant B2	No, not really.
Participant B3	No, I think I'm good.
Participant C1	Not for now.
Participant C2	No.
Participant C3	I am curious about the board game Ventures & Unicorns and how it might help with ideation.
Post Workshop	**How did you feel while playing Venture & Unicorns?**
Participant A1	It was fun! It generated more ideas than I thought. I thought a lot of the cards offered insight into potential challenges that could be further developed.
Participant A2	I thought it was a very fun game, but I am also a person who loves board games, so I think it's fun. It felt like a very competitive game, which was both good and bad. It makes the game fun, but it could derail you from the purpose of the game. I noticed that I sometimes thought more about winning, than just coming up with good ideas.
Participant A3	I thought it was good, it was challenging, though! The questions were not too difficult but difficult enough to get you thinking. I think it… it was… To a point it was more optimal not to challenge but to try to save money and to… to do add-ons instead of challenging. Mostly because I felt the time was a bit short and that it was hard to come up with a good challenge. More if you want to challenge an idea, I felt that only a minute was a bit too short. But it was fun, a very fun ideation-based game.
Participant B1	I really enjoyed it and I think that the time flew by really fast. It was an overall fun experience and during the gameplay I really had to think a lot. It was sometimes really hard to come up with answers though. Like when we were playing and you got one idea from one of the questions

	then you really want to go back to that spot, but you were stuck somewhere else on the board.. but then again, that gave me more time to keep on thinking about it, so yeah.
Participant B2	Delighted, enthusiastic, superb, energized and stimulated
Participant B3	I thought it was a fun game and it really pushes you to think about your ideas, flesh out your ideas and make them make sense to your competitors.
Participant C1	While I did enjoy playing the game, I did find that it was sometimes difficult to balance the fun aspects of the game with the serious business of generating ideas. There were a few challenges, such as some participants not taking the game as seriously as others, which could be addressed in future workshops by setting clear expectations and goals at the beginning of the game.
Participant C2	I enjoyed playing Venture & Unicorns! It was intense in the beginning but got clearer the more we played..
Participant C3	While playing Ventures & Unicorns, I felt engaged and excited to generate ideas and see what other players came up with.
	Did the gamification elements help you generate more and/or better ideas? If so, how?
Participant A1	One thing that we didn't have in the game, compared to our previous ideation workshops, we were not given the opportunity to co-develop the ideas with the other participants. The competitive nature of the game for sure made it more fun to ideate, but it could be good to have some type of discussion in the middle of the game to harness the power of collaboration. I liked the money part, by getting gratified for ideas and engaging in the game, it felt good to contribute.
Participant A2	I would say it was positive in the way that it made it more fun, but I noticed that our ideas were not that unique, kind of low hanging fruit. Many of the ideas were very broad. I believe that every idea would need a challenge, like "what would you do in this economy". Other than that, it was very fun so I would like to do it again.
Participant A3	I think so, because usually when it comes to ideation, I think when in a group, you don't want to feel like.. I mean you want to make the ideas better, but you also don't want to make the other people feel bad by criticizing their ideas. But here it is a game, so it's kind of the point, and it makes it easier to challenge others' ideas without making them feel bad or going against them. It's just a game you know? If it wasn't a board game but kind of the same process, it could have a bit more bad feelings. Now it's a game so it's fine, although it's still kind of the same. So it really gamified it in a good way, if you could say that.
Participant B1	The gamification allowed me to like get more into the process and the

	questions, if you know what i mean. Otherwise, if we would have only discussed the questions, I think it would have been quite a short discussion, no matter the topic. Even though there were a lot of big topics, and we didn't always have a lot of knowledge about them, the game was laid up in such a way that it kind of allowed us to develop ideas around them together that are probably better than anything i could have come up with myself, and that made it really interesting. The gamification part gave me more play and I think that it made me listen to the other players more intensely than I would have in a normal meeting.
Participant B2	Definitely. Competing against others challenged me to come up with more innovative ideas on a short timeline.
Participant B3	I think that it helped, 'cuz when you get these problems or challenges that you have to think about, it really forces you to think about what the potential solutions might be and how these could be implemented. So basically just to flesh it out, so yeah i think that this gamification idea could definitely be helpful for many.
Participant C1	It was interesting to see how everyone's ideas meshed together and how we were able to build on each other's ideas to come up with even better solutions.
Participant C2	The gamification elements definitely helped me generate more and better ideas. It was fun to come up with creative solutions to the problems presented in the game, and I found myself thinking more outside the box than I usually do.
Participant C3	The gamification elements of the game definitely helped me generate more and better ideas. The game provided structure and prompts that helped guide my thinking, and the competition aspect added a fun and motivating element to the process.
	Were there any challenges or drawbacks to using gamification in the workshop? How could these be addressed in future workshops?
Participant A1	I felt like the minute you got to come up with a valid solution to the problems could be quite challenging. It depends on what results you are expecting but in some cases there wasn't enough time to think of a great idea. It was easier in the beginning, but when you've done it for some time you get quite tired of generating additional improvement or ideas on the same problems.

Would be great to be given the opportunity to write down the ideas after you've pitched the idea orally. As the notes were presented in front of us, we naturally started writing instead of using the minute to present our idea. |
| Participant A2 | No, that's basically my thoughts. I was thinking if the game would be better if we sat and worked together, but I don't know if it would have |

	made the game better.
Participant A3	I think that maybe it should be longer than a minute for the challenges and the add-ons. Because as the game progressed, the ideas became more and more evolved and better. So it's harder to come up with add-ons or better ideas, but the time is the same. So maybe it could be like a shorter time at first, and longer as the game progresses. Just so that you can actually take time to think through it. Sometimes it was like "oh what is this idea, I don't remember, I have to read It again" and sometimes the topics got a bit hard. Also, the add-ons and ideas are also like evolved, and harder. You have to read and think... I think a minute is a bit short I think. I also think it would be fun to have more star-cards, or slots. A bit more "now I can do this", maybe like... I guess, maybe have some more "jail" or ... just not have the jail just because it doesn't do anything, and so just replace it with something else. Something random and different, I felt like it didn't do anything. It felt like it could be used for something else and more game-y.
Participant B1	So I think like, if you would use it in more of a company setting or professional setting, I think that some people and their proposals could be pretty down-voted. So I think it might be good to make rules about how much you can down-vote people. Or like you know, how much you can "stop" their proposals. Like if there is a final level or something that you can reach so that people can no longer down-vote your ideas or something. But that's the only case I can imagine, otherwise I think it was great.
Participant B2	Yes, just because of the time limit. I wish I had some more time to think sometimes. But how could it be addressed in the future? Maybe just a little more brainstorming time to think some more about the questions.
Participant B3	I think that one potential issue is that you might start to see it more as a game rather than a cooperative type of thing in which you try to come up with ideas together. So sometimes you may be more focused on getting points rather than actually wanting to come up with the best idea together
Participant C1	While there were a few challenges to using gamification in the workshop, I think they could be addressed in future workshops by setting clear expectations and goals at the beginning of the game.
Participant C2	A challenge was that some participants did not take the game as seriously as others. I'm not sure how you could prevent this from happening in the future.
Participant C3	One challenge with using gamification in the workshop was that some players may have been more competitive or focused on winning than on generating ideas. However, this could be addressed in future workshops by emphasizing the importance of collaboration and idea generation over competition.

	Were there any unexpected outcomes or impacts of using gamification in the workshop?
Participant A1	I noticed time passed by very quickly as it was a lot of fun to play. In addition, I got very focused on the game and was not distracted by things around us which was helpful to say the least in the mission to come up with great ideas. I really liked the concept of the add-ons where you were able to "build on each other's ideas" which I will apply in our future workshops.
Participant A2	Not exactly, I don't think I will be working on any of the ideas that we came up with. I do believe however, that it is a great way to open up discussions for ideas. Like you really must think why ideas work or don't.
Participant A3	Not really, I thought it was... I didn't have any expectations so thought it was good. Absolutely a fun way to create ideas. I do think though that the rules should be.. there should be some rules against like mythical and like non-doable ideas. Because for me, if you want to create an idea it has to be doable in some manner, not just magic solutions because anyone can come up with that and of course they will be better than a real one, so I think that to some reality aspect as a rule would be good right? No magical creatures you know? Even though it's a game it makes the game a bit more silly. It should be serious to a certain degree. Everything can be solved with magic, but that no applicable to a real problem. That the main thing I reacted to. But otherwise, there wasn't anything I reacted to that much.
Participant B1	I think people had to answer questions that they don't really ever usually think about, or have an opinion about, but still came with good ideas to settle, or solve the problem, and that's a good thing! I really enjoyed it, and I think it has like three purposes. First, like an established company game. Second, like a game that you use when trying to start a company with friends. And third, I think you could tweak it a little to turn it into a party game.
Participant B2	I just think it boosted my creativity in a short amount of time. It really helped me come up with something innovative faster and usually I can't do that in such a short amount of time. So yeh, very cool to bring a competitive aspect to the process..
Participant B3	Hmm, i think i will have to go back to what i just said, that the idea itself is quite good itself as it makes you creative, it makes you think, it makes you try to flesh out the ideas that you've got and that you propose. But since it's a game, it can also get really competitive and sometimes you lose sight of what the game is supposed to achieve i guess.
Participant C1	One unexpected outcome of using gamification in the workshop was that it made the structured ideation process feel less like work and more

	like a fun and engaging activity. Another one was that I learned a few things, specifically from devastating stats presented bt the challenge cards. On top of that, you get different perspectives from the other players that in some of the cases was enlightening for me.
Participant C2	Time went flying while we played the game which may be a sign that I enjoyed it, way more than I expected to be honest. I was surprised by the combination of competitiveness and collaboration which the game enabled.
Participant C3	One unexpected outcome of using gamification in the workshop was that it helped to create a more social and interactive environment, which encouraged players to share and discuss their ideas with each other.
	Did you feel the game added any social element that you are not used to prior?
Participant A1	I think it's a great way for nascent entrepreneurs that don't know each other so well to break the ice in a playful and relaxed manner within the ideation process. It's quite competitive, so you might start to "kill" others' ideas in order to win instead of perhaps developing the best ideas.
Participant A2	Yes, as I said on the previous question, I believe it is a great tool to open up discussions.
Participant A3	Yeah, I think that it really added a competitive aspect to it. When we have ideation it's usually not really… You don't compete against anyone, you just compete against yourself like trying to improve your idea and you don't really challenge anyone, like I said before because you don't want to make anyone else feel bad. It's not the point of ideation to put down others but to create, here however you can still improve on each other's ideas without making each other feel bad. This is because, you know, it's a game, it's fun… so that is probably the best aspect of it. There really is something in it that I haven't experienced before. It is challenging and more competitive when I compare it to what I am used to. And that also pushes yourself to be better than the others, in a whole other way than you usually when it comes to ideation.
Participant B1	Yeah, I think it made me try harder to be more creative, even though it was really hard at times. I do also think that if you've played it a couple of times it would get easier to really get the mind flowing. But I think that it helped with mindfulness, like I mean to really get the mind thinking and to better react to stuff that happens within the confines of the game.
Participant B2	Yeh, it was fun, and it challenged you because others were questioning your ideas and made you think twice about the concepts you bring to the table. And working with a group definitely allows you to narrow

	down your best ideas and throw out those that don't make any logical sense.
Participant B3	Well I feel like I've, like I said before, that when we've tried to come up with ideas before we've usually done it in a group, but this game really sets up a better structure and makes the process of coming up with good ideas more efficient. But with the potential drawback that you could lose sight of the actual end goal and might see it more as a game i guess.
Participant C1	Overall, I think using gamification in ideation workshops can be a valuable tool for generating ideas and engaging participants.
Participant C2	Yes exactly as I said prior, the social element of collaborating in building ideas but competing in winning the game.
Participant C3	The game added a social element that I am not used to prior, as it allowed for collaboration and idea sharing with other players.
	Any additional comments?
Participant A1	I felt you included a wide range of problems and topics which most people can relate to which makes it easier to come up with solutions on those problems as you, as a player, most likely have experienced some problems related to those topics in your daily life.
Participant A2	I believe it would have been interesting to see what would happen if you could have more add-ons, or more ways of developing the ideas. Other than that, I just want to highlight the fun I had. Games are a great format.
Participant A3	I don't think so, I thought the game was good! It would be good to have like some printed rules maybe and some more clarification when it comes to which field of the board is which. I mean it was quite clear but like if you turn it into and actual board game in the future, I think that would be a good idea. But I don't think I have anything else to give as input. I think it was a good game, it was challenging, and it was fun. Overall very good, and if you could choose your own topics, I think you could really come up with some good stuff by using the game. So yeah, much fun.
Participant B1	I think the game layout was perfect, it's really good. Some of the questions were perhaps too big and some were maybe a bit harder than others to relate to a possible company. But overall i think it was a great game, like my expectations were actually not this high, so it was better than i thought it would be for sure, very fun.
Participant B2	Super fun game, I really enjoyed it and I think you could probably commercialize the game if you just add some more graphics, but the basis of the game could be sold, and I hope you pursue that further.

Participant B3	Just that in general maybe, that it could be more clear if the point is to solve societal problems or if it's just to create a flourishing company with a goal of making money. Or not necessarily to make money, you could go +-0 but like if it should be an idea that at least has the possibility to make money, like a company that could be sold for something.
Participant C1	Not more than I enjoyed playing the game and wish you the best on your thesis!
Participant C2	No thank you.
Participant C3	Overall, I found Ventures & Unicorns to be a fun and effective way to generate ideas and engage with others. I would definitely consider using it in future ideation workshops.