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SPRIG: Serious Privacy Game Workshop

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Abstract

The world relies more and more on information technology, for everything from emails, to turning on lights. Huge amounts of data are created every moment, and much of it is related to one or more people. Among this increased use information technology and amounts of data, it is hard to know what information is collected and stored about you. Reading and understanding terms of agreements are hard, and even if you understand them, you might not be aware of the consequences of sharing data that can seem innocent. There is effort such as the General Data Protection Regulation that tries to clarify for the user what data is collected, for what purposes, and for how long it is stored. However, it is still up to the consumer to make a decision. Raising the general population's awareness of privacy issues should, therefore, be a priority.

The goal of this project is to create a tool for raising awareness of privacy issues in children and young adults. This was done through developing a workshop that introduces the participants to serious games and privacy issues. The workshop creates an arena were children, and young adults can acquire knowledge about privacy issues and through collaborating on designing a serious game, discuss the issue and how to raise awareness of that issue.

The workshop was run with lower and upper secondary school students as well as university students. 38 students were involved in the preliminary work, 11 were involved in the pilots executed. Two classes with 32 students from upper secondary school and 28 university students were part of evaluating version 1 of the serious privacy game workshop. Three classes with 70 students in total were part of evaluation version 2 of the workshop. In total, 141 students and their teachers have been involved in this project in some way.

The Workshop is based on the Triadic Game Design Workshop described in Harteveld and Kortmann (2009), and combines, reality, meaning, play, and technology to create serious games based on privacy issues. The workshop has four parts reality, meaning, play, and technology. The workshops consist of a board with covers that hides the parts of the workshop not yet started. The covers have instruction for the part it hides. In addition to the board does the workshop have three types of category cards that contain information about privacy issues, awareness raising, and technologies. The workshop also has a set of question cards, one for each part of the workshop, functioning as a worksheet that helps facilitate the group's discussion and provides a means to communicate the group's ideas.

The results show that the participant's awareness of privacy issues was raised after the workshop. The workshop also produced a relevant serious game concept for raising awareness of privacy issues.

Sammendrag

Verden bygger mer og mer på informasjonsteknologi, for alt fra e-post, til å skru på lys. Store mengder data opprettes hvert øyeblikk, og mye av det er relatert til en eller flere personer. Blant denne økte bruken av informasjonsteknologi og datamengder er det vanskelig å vite hvilken informasjon som samles inn og lagres om deg. Det er vanskelig å lesing og forstå vilkår for bruk, og selv om du forstår dem, er du kanskje ikke klar over konsekvensene av å dele data som kan virke uskyldige. Tiltak slik som General Data Protection Regulation forsøker å klargjøre for brukeren hvilke data som samles inn, og til hvilke formål og for hvor lenge den er lagret. Det er imidlertid fortsatt opp til forbrukeren å velge hva som deles. Å øke den generelle befolkningens bevissthet om personvernproblemer bør derfor være en prioritet.

Målet med dette prosjektet er å skape et verktøy for å øke bevissthet om personvern hos barn og unge. Dette ble gjort ved å utvikle en workshop som introduserer deltakerne til serious game og personvern. Workshopen skaper en arena hvor barn og unge voksne kan skaffe seg kunnskap om personvern og gjennom samarbeid om å designe et serious game, diskutere problemet og hvordan å øke bevisstheten om det aktuelle problemet.

Workshopen ble gjennomført med ungdomskole og videregående elever samt studenter i høyere utdanning. 38 studenter var involvert i forarbeidet, 11 var involvert i pilot versjoner av workshopen. To klasser med totalt 32 studenter fra videregående skole og 28 universitetsstudenter var del av evalueringen av versjon 1 av det serious privacy game workshopen. Tre klasser med totalt 70 studenter var en del av evalueringsversjon 2 av workshopen. Totalt har 141 studenter og deres lærere vært involvert i dette prosjektet på en eller annen måte.

Workshopen er basert på Triadic Game Design Workshop beskrevet i Harteveld and Kortmann (2009), og kombinerer, virkelighet, mening, spill og teknologi for å skape serious games basert på personvern. Workshopen har fire deler virkelighet, mening, spill og teknologi. Workshopen består av et brett med deksler som skjuler deler av workshopen som ennå ikke er startet. Dekslene har instruksjon for den delen den gjemmer. I tillegg til brettet har workshopen tre typer kategorikort som inneholder informasjon om personvern, bevisstgjøring og teknologier. Workshopen har også et sett med spørsmålskort, en for hver del, som fungerer som et arbeids ark som bidrar til å legge til rette for gruppediskusjonen og gir en måte til å formidle gruppens ideer.

Resultatene viser at deltakernes bevissthet om personvernproblemer ble økt etter deltagelse i workshopen. Workshopen produserte også relevant serious game konsepter for å øke bevissthet om personvernproblemer.

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Chapter 1

Introduction

1.1 Problem definition

The amount of data collected from users grows as the popularity of digital services increases. Many users do not know how much they share, with whom, or what the businesses they share information with can do with the information they collect. The General Data Protection Regulation (GDPR) seeks to improve this by forcing businesses inform the user of what data they collect, and how the collected data will be used[add ref].

GDPR will make it easier for the consumers to understand what information they give up, while it's still up to the consumer to decide what to share. This is necessary as Terms of Service(ToS) are often hard to read and and understand. inspiring services such as "Terms of Service; didn't read", who provides brief bullet summaries of ToS noa. Data privacy requires ownership of the data Gates and Matthews (2014), and GDPR strengths the users ownership of data.

However, GDPR does not protect the consumer when businesses get hacked. Their information can still get leaked and used to hurt the consumer.

In the UN's Universal Declaration of Human Rights, privacy is a human right, stated in Article 12. Privacy might not seem important, but it is a serious topic that affects us as both humans and communities. For instance, the leaks of profiles on the dating site Ashley Madison(a married dating app) has resulted in multiple suicides Lee by affected users.

Looking at how to raise the awareness of young users at the point where they are getting started using digital services, appears like a good investment as what children share at a young age can affect them for a long time. School has been looked to as place to educate young users about online safety. Many of the programs developed focus on Internet safety in general, and therefore does not include some of the risks that using

social media can give Vanderhoven et al. (2014).

1.2 Research Questions

Privacy is a complex and abstract issue. This thesis seeks to raise awareness of privacy in a classroom setting, by creating an artifact that can be used by teachers to teach students about privacy. Thus, the artifact creates a situation that facilitates discussion about privacy issues, and helps emphasizing their importance. A group activity fitting the setting, and serious games seemed like a good way of presenting the complex and abstract problem of privacy.

RQ 1: How can co-design of serious games be used to evoke children and young adult's awareness about privacy?

RQ 1.1: Can co-design of serious games about privacy with children and young adults result in relevant game concepts, given the participants receives an introduction to privacy?

RQ 1.2: Can participating in a co-design workshop raise awareness of privacy in children and young adults?

Including children and young adults in the creation of serious games not only has the potential of increasing the participant's awareness, but also of creating viable ideas for serious games that can be used to promote awareness for others.

1.3 Context

This project was done under the project Awareness Learning Tools for Data Sharing Everywhere (ALerT)[1]. A project that will develop tools for evoking awareness about personal information in digital environments.

Preliminary work, pilot and the first version of the workshop described in this thesis was developed in collaboration with Erlend Berger and Torjus Hansen Sæthre. The following chapters contains work written as part of this collaboration: Chapter 3, Chapter 4, Chapter 5, Chapter 6. Their work is published as "Serious Games: A Tool to Raise Privacy Aware- ness" Berger and Sæthre (2017).

1.4 Approach

This project uses the Design Science research paradigm Hevner and Chatterjee (2010). The Design Science Research paradigm is highly relevant to information systems. The

[1] https://www.forskningsradet.no/prosjektbanken/#/project/NFR/270969

Design Science research paradigm is pragmatic since it supports the creation of innovative artifacts to solve real-world problems. Design Science can be explained with the below three research cycles and seven guidelines.

- **Relevance cycle** understanding and defining the requirements of the artifact that is to be created, as well as testing the artifact in its relevant environment.
- **Design cycle** selecting requirements to fulfill, design and evaluate the artifact in cycles, until it is ready to be introduced into the application environment.
- **Rigor Cycle** retrieving existing knowledge to understand how the artifacts requirements can be solved, and contributing new knowledge to the knowledge base.

The researcher iterates within the cycles and goes back and forth between them when needed. Starting in the Relevance cycle and ending in the rigor cycle.

Within these three cycles can seven research activities be identified based on the Design Science checklist also provided in Hevner and Chatterjee (2010). These activities are shown in figure 1.1.

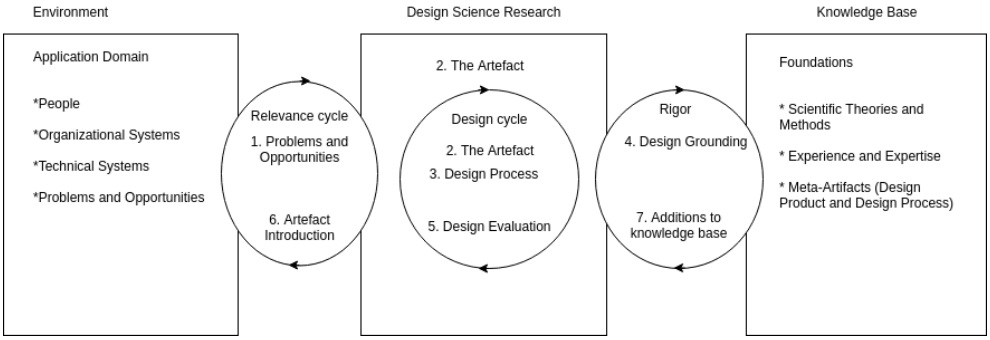

Figure 1.1: Diagram showing the Design Science cycles and research activities.

1. Problems and opportunities

The first research activity is understanding the problem and creating a research question that tries to answer a problem. In this project understanding the domain was done in multiple ways;

- Helping facilitate the Tiles workshop Mora et al. (2017)
- Looking into an existing workshop for creating serious games
- Looking into GDPR

- Gathering information about secondary school students attitude to privacy as well as what kinds of services they use.

These activities was done in the autumn in collaboration with two other master students. The gathered knowledge was used in a workshop tested on some secondary high school students. Original the plan was to use this information to create a serious privacy game that could be used to raise awareness of privacy issues to the same target group. The workshop ended up being an interesting contribution in itself, and thus the focus shifted to further developing the workshop.

2. The Artifact

The next activity is to identify what the artifact is. In this case, it is a co-design workshop of privacy-related serious games that provides a context to educate about privacy.

3. Design Process

The next step is to identify the design process that will be used to build the artifact. The process used to build the artifact was creating the first version of the workshop based on the understanding of the environment and then evaluating it by running the workshop in different contexts gathering feedback that was feed into the next iteration of the workshop. The workshop was executed six times with classes ranging from 14 to 26 students each. In addition to running the workshop, feedback was gathered from an experienced workshop facilitator, a focus group consisting of seven participants from one of the workshop execution, and feedback from the co-creators.

4. Design Grounding

Next is supporting the artifact and design processes with knowledge from the knowledge base. This was done through reviewing state of the art to understanding the problem and opportunities.

5. Design Evaluation

Next is identifying how evaluations are performed during the design cycles, as well as what improvements are identified during each design cycle. Evaluation in the design cycle was done by gathering feedback from workshop executions. The improvements identified during each design cycle were mainly related to simplifying the process of the artifact, as well as improving its communication of knowledge of privacy issues. This was done by looking at the game ideas generated and the feedback collected from the workshop evaluating difficulty level and enjoyment.

6. Artefact Introduction

Next is how will the artifact be tested and how are its utility and improvement measured. Again this was done by executing the workshop and gathering feedback from a standardized survey. The survey was modified between the different versions, to balance the amount of data collected and the relevant information gathered. The ideas generated by the workshop were also collected and evaluated so as to evaluate the artifact's utility and improvement(s).

7. Additions to The Knowledge Base

Finally what new knowledge is added to the knowledge base and in what form. The knowledge gained from this work is presented in this report as well as on the website of the workshop supporting teachers wanting to facilitate the workshop created for their classes.

1.5 Instantiation of the Design Science research cycles

The activities done as part of this project can be seen in Figure 1.2 with an explanation of the different research activities in Table 1.1

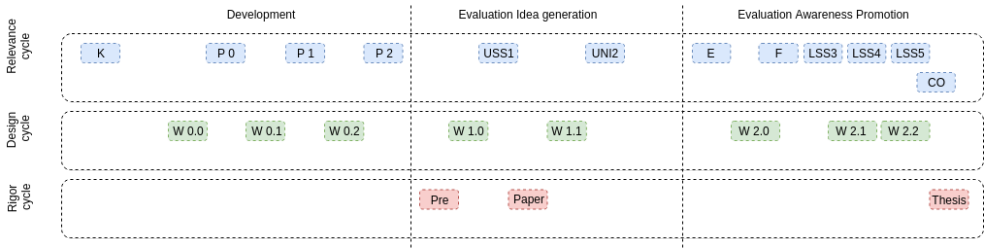

Figure 1.2: Diagram showing the research activities done in this project.

ID	Description
K	Kahooth! to collect teens attitude towords privacy issues. Further described in section 4.1.
P0	Pilot 0 of the workshop. Short execution to make sure the instructions were clear. Described in section 5.3 .
P1	Pilot 1. Workshop execution with 3 students in the intended age group. Described in section 5.4.
P2	Pilot 2. Second pilot to test changes to workshop artifacts and improved process and instructions. Described in 5.5.

USS1	Workshop execution with two upper secondary school classes. Described in section 6.1.
UNI2	Workshop exectution with students at NTNU as part of a course were the students created serious games with focus on privacy and communication. Described in section 6.2.
E	Feedback from an experienced workshop facilitator. Described in section 6.3.
F	Focus group help with students that participated in UNI2 (6.2). Described in 7.1
LSS3	Execution of workshop version 2 with lower secondary school students. Described in 7.2
LSS4	Execution of workshop version 2 with lower secondary school students. Described in 7.3
LSS5	Execution of workshop version 2 with international lower secondary school students. Described in 7.2
CO	Feedback from discussion with co creators after some runs of version 2 that they had not been involved in. Described in section 7.5
W0.0-2.2	Workshop versions see table 1.2 for a list of characteristics and evaluation.
Pre	Common chapters describing the work done in the fall was was delivered as part of the co-creators specialization project.
Paper	A paper describing the workshop was submitted to Internationlal Conference on Entertainment Computing (IFIP-ICEC'18) ifi. The paper can be read in Appendix A
Thesis	The last activity in the rigor cycle is the delivery of this thesis; SPRIG: The Serious Privacy Game workshop.

Table 1.1: Project research activities

1.6 Overview of Workshop Versions

In table 1.2 are characteristics and evaluation for each version of the workshop described.

ID	Characteristics	Evaluation

0.0	The workshop had two boards. One with instructions and one with questions to answer. Reality, Meaning, Play, and Technology cards were part of the workshop. Redraw of cards were allowed. Each art of the workshop is independent and the parts are merged in the last part. A presentation introducing privacy and why it was important started the workshop followed by a Kahooth! as a warm-up activity.	Tested the workshop in 30 minutes by using some university students at hand. Focusing on understandability of instructions and pieces. See 5.3 for more.
0.1	Two boards. One board to place the selected cards, one with questions as before, but with added covers to hide the questions and instructions on the inside of the covers. No changes to cards. Reality card were chosen the rest of the cards were randomly drawn. Presentation and warm-up activity as before.	Tested with three upper secondary school students. Focusing on understandability and ideas generated. See 5.4 for more.
0.2	One board with questions and covers that contains instructions. Removed all but "Attitude and Awareness" Meaning card. Added diagram to explain the steps.	Executed with two groups of 3 upper secondary school students. Focused on understandability and idea generation. See 5.5 for more.
1.0	Board, cards, and process unchanged. Some improvements to instructions and text on cards.	Executed workshop with two classes of 30 students in total. Focused on generated ideas and awareness raising. See 6.1 for more.
1.1	Board with covers but without questions. Questions moved to lose cards to make it easier to write and present. Cards and process unchanged.	Executed with 28 university students to evaluate idea generation. See 6.2 for more.
2.0	Board unchanged apart from updates to instructions. Play cards removed. Each of the workshops four parts build on the previous. Technology cards is selected not random.	Run with lower secondary school students. Focus on idea generation and awareness promoting. See 7.2 for more.
2.1	Board, cards, process and presentation unchanged from last run. Kahooth! removed as warm-up activity.	Run with lower secondary school students. Focus on idea generation and awareness promoting. See 7.3 for more.
2.2	Workshop translated to English. News articles relevant to each Reality card were added to the presentation.	Run with international lower secondary school students. Focus on idea generation and awareness promoting. See 7.4 for more.

Table 1.2: Characteristics and evaluation of the different versions of the workshop.

1.7 Outline

This chapter has given an introduction to the problem definition, research questions, context and research method. The next chapter presents the state of the art of serious games and co-design workshops. Chapter 3 describes the workshop developed in this project and how to execute it. Chapter 4 presents the preliminary work done. Chapter 5-7 presents the three iterations of the workshop and its evaluation and discussion. Finally , chapter 8 presents the conclusion, limitations, and future work of this project.

Chapter 2

Related Work

2.1 Triadic Game Design Workshop

Triadic Game Design(TGD) is model for designing Serious Games(SG) balancing the three worlds of Reality, Meaning and Play. Harteveld and Kortmann (2009)

Games has always a relation to reality and in a serious game this relation is often even stronger. To simplify this connection a subject matter such as diplomacy or health. Harteveld and Kortmann (2009)

All games has meaning and they can effect society by affecting our attitudes and behavior. In serious games are the meaning of the game more important in other games. The game is created for a specific purpose such as improving the players coordination or to raise awareness about a problem.Harteveld and Kortmann (2009)

The last world play looks at how to achieve immersion, fun and engagement in a game. Games comes in many genres among them are First Person Shooters and Horror games. Harteveld and Kortmann (2009)

The TGD workshop builds around the concept of TGD and has four assignments, ice-breaker. Reality, Meaning, Play. The workshop is run in groups of 3-5 people and provides the groups with work sheets and reality, meaning, and play cards. In assignment 2, the groups randomly picks a theme from the reality cards. In assignment 3, the groups randomly picks a function from the meaning cards such as persuasion or social skills. In assignment 4, the groups pick a random genre such as role-play or shooter, and try to come up with a game design concept based on the previous two assignments. Between the assignments are the groups ideas pitches and the groups gives points making the workshop a game in itself. Harteveld and Kortmann (2009)

TGD builds on the triadic theoretical framework for serious games explored in Druin (1999), comprising the elements of play, pedagogy, and fidelity. TGD explores how to balance these aspects when creating a serious game.

2.2 Co-design

In co-design are cards often used to promote idea generation Vaajakallio and Mattelmäki (2014). In Mora et al. (2017) the authors have used cards and a structured workshop to promote co-design of IoT systems. A combination of physical objects such as cards and a structured collaborative process is also common in game design. Using cards makes focus change easier (Hornecker (2010)).

Using a game like process in collaborative design can improve idea generation and communication. The use of cards makes arguments less abstract during discussion. Physical objects can also speed up the process and help the participants focus while still allow for interpretation Hornecker (2010). Using a game like process seems to remove pressure to perform improving idea generation.

Outcome of a workshop is affected by how familiar the group members are with each other, how familiar they are to creative processes, and their knowledge of the domain. Hornecker (2010)

2.3 Serious Games

Games has been an important part of societies for several thousand years. Some of these games can be considered serious as they had serious intent, educating about accounting. Laamarti et al. (2014) Serious Games are games that has a deliberate educational intent and not trying to only entertain the player. To achieve this the games should deploy constructivist pedagogical strategies(CPS)Ravyse et al. (2017). CPS as described by Osterman (1998) should: engage the learned; provide opportunities to explore, articulate, and represent knowledge; challenge existing conceptual views and heighten awareness of problems; and allow students to test the efficacy of new ideas. In addition to these strategies are specific strategies for serious games that should be taken into account; nothing happens without player input; earlier problems encourage the player to build hypotheses, which could be applied to later problems; lateral exploration and thinking allow players to understand their goals in new ways; new types of problems is thrown at the players at regular intervals restarting their cycle of masteryRavyse et al. (2017).

Some challenges when creating serious games are balancing fun and learning, keeping the game entertaining while still transferring knowledge or skills efficiently. How detailed the games needs to be to transfer knowledge well is also under debate with studies showing that there is not necessarily correlation between fidelity and knowledge transfer. Much of recommendations, guidelines, and assessments of serious games are given based on single games created for a specific field. Ravyse et al. (2017).

2.4 Related Serious Games and Privacy Tools

Multiple serious privacy games has been made. Friend Inspector is a game focusing on teaching about privacy settings on Social Networks. Other tools analyze your public profile on social media and give personalized recommendations. Some games such as Realistic Facebook Security Simulator queries the players privacy preferences based on a set of fabricated personal data. Friend Inspector uses data from the user Facebook profile to ask the players privacy settings to relate on a more personal level. Cetto et al. (2014)

2.5 Game Analysis

2.5.1 Awareness Games

McDonald's Video game

McDonald's Video game is a satirical business simulator. In the game, the player is a business manager of a McDonald's, trying to make the business run successfully. The player is presented with options that are good for business but bad for the customers, the employees, and the environment. Some of the bad choices comes back to the player.

The game is an anti-advergame for the fast food industry. Allowing the player to see the benefits and costs of doing decisions that benefits the business but cheats everyone else. The game is available at `http://www.mcvideogame.com/index-eng.html`.

The Uber Game

The Uber Game gives the player the experience that some of Ubers drivers has. Taking decissions to earn enough for a living. The game is a text-based adventure game. The game communicates the stress of individuals trying to make a living as drivers for Uber Kaser (2017). The game created as a suppliment of *Financial Times* story "Uber: The umcomfortable view from the driving seat" Hook (2017). The game is available at `https://ig.ft.com/uber-game`

2.5.2 Privacy Games

Privacy Pirates

Privacy Pirates is a game that teaches young children aged 7-9 about online privacy, focusing on what is appropriate in different contexts. In the game the players get asked questions about online privacy. Correct answers gives pieces of a treasure map. This is done to introduce that prsonal information has value. In the game the player has access to a "mentor" character that provide advice if requested, to communicate that when i

doubt, ask a trusted adult. The game was developed by Media Smarts, Canada's centre for digital and media literacy with founding from Google.

The games website:
http://mediasmarts.ca/game/privacy-pirates-interactive-unit-online-privacy-ages-7-9

Interland

Interland is a project by Google to prepare children to take smart decisions online. Interland consists of teaching material along with a game consisting of a set of minigames. Interland focuses on 5 fundamentals; Share with Care, Don't Fall for Fake, Secure Your Secrets, It's Cool to Be Kind, When in Doubt, Talk It Out. Trough these fundamentals, awareness of; critical thinking, protecting oneself from online threats, being smart about sharing, being kind and respectful, and of asking for help.

Interland consists of 4 mini games aimed at young children. Each game discusses one of the fundamentals, asking for help being common to all games. Each game allows the user to do bad, good, and less good decisions. The different solutions gives constructive feedback and is reflected in the players progress.

Interland can be explored at: https://beinternetawesome.withgoogle.com/

Friend Inspector

Friend Inspector is a quiz game that connects to you Facebook profile and uses data from your Facebook account to create question about online privacy in social media networks. The player is asked to guess the visability of a item the user has shared himself, within a limited amount of time. After playing the game the user gets a score based on how well they answered the questions, and how long time they used to answer. This score can be shared on the players profile Cetto et al. (2014).

The game can be played at: http://www2.open.ac.uk/openlearn/privacy/game/

Privacy and Security Awareness Training Game

Privacy and Security Awareness Training Game: Spot the Privacy and Security Risks, is a risk spotting game where the player identifies privacy and security issues in an office. The player clicks on points he things are a privacy or security risk and at the end of the level gets a feedback of how many were correctly identified and how many were not security or privacy risks. The player gets feedback about each risk, learning more about each issue. The game is for an older audience.

The game is a commercial product. Its website can be viewed at: https://www.teachprivacy.com/spotrisks/

Chapter 3

Workshop

This chapter was written in the collaboration described in Section 1.3 with additions and modifications to reflect the latest version of the workshop. The modification involves the change of target group from 15-19 to 13-19, the removal of Kahooth! as ice-breaker activity and complete rewrite of guide to running the workshop in Section 3.3. Additions include Section 3.2.6, play cards and Section 3.2.3, process Further details of the changes are given in the relevant sections.

There are multiple possible purposes for a game design workshop. Developing a full game, letting the participant learn about a problem or just developing ideas for games are some of the possible purposes. This workshop focuses on developing ideas for game, but the participant also has to think and discuss a problem, they may therefore learn about the problem from the other participants or by reasoning about the problem in a new setting.

The participants this workshop is aimed at, our target group are students in secondary school. So students from 13 to 19 years old. The reasoning behind this target group is that the student in that age group are old enough to have used digital platforms for some time and also be old enough to understand some of the challenges. The target group of the workshop Triadic Game Design that this workshop is based on have also affected the target group. Further simplification and possibly a translation of the game parts to Norwegian will make this workshop more relevant for students in the age of 13-15.

The workshop has 4 parts focusing on the three parts of the Triadic Game Design, Reality, Meaning, Play, and a fourth part introduced by the authors, Technology. The Triadic Game Design is introduced in the next section 3.1 Triadic Game Design.

The workshop has been adopted to work better with Norwegian students in secondary school. This group is the target group of the author's master projects and having

secondary school as target group does not limit the workshop from being run with older subjects. Most significant changes are connected to shortening the workshop and to simplify the language and process to make it more intuitive for the participants as some of the structure was lost with the shortening of the workshop. More about the modifications to the Triadic Game Design Workshop can be seen in the section "Changes to Accommodate Privacy".

The workshop needed to be shortened as it was designed for a half day for adults. The setting for the modified workshop is in a classroom with groups of Norwegian secondary school students. The output of the workshop is mainly idea generation. Apart from idea generation is the participants understanding of game genre, motivational factors and understanding of a privacy related problem collected. The workshop facilitates discussion of privacy related topics and in so it may also promote awareness of privacy related problems on itself.

3.1 Triadic Game Design

The underlying foundations of the workshop are based on the Triadic Game Design by Casper Harteveld.

Further studying literature about the triadic game design made it clear that the workshop did not have a fixed number of steps, but could differ. In order to provide a concise explanation of the workshop, the following part will in majority use the article previously mentioned as a basis.

The main idea of Triadic Game Design is built on three core elements: play, meaning and reality. In order to make a successful serious game, these three elements must be balanced against each other. The first core element only considers play and how to make an entertaining game. Only considering this element would be the same as designing a regular game made for entertainment. The second core element considers meaning, and can be closely related to the definition of a serious game. The game designed should provide a value beyond play itself like educating or raising awareness. The third and final element involves reality and looks to bring in a real world subject. Together, these three elements can complement each other or be conflicting, and there are these trade-offs the participants will experience and have to consider throughout the workshop.

Harteveld suggests that the workshop has "a flexible format and can be adjusted in several ways"[1] and further proposes alterations such as choosing a theme or changing the order. To begin with, the participants of the workshop are divided into groups of three to four people and given an icebreaker assignment. The task is to create a construction with three spoons on top of three cups placed a spoon-length apart, that can

[1] http://www.northeastern.edu/casperharteveld/tgd/suggestions.html

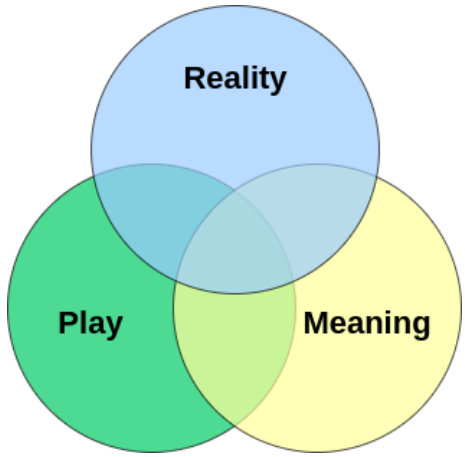

Figure 3.1: Triadic game design consists of Reality, Play, and Meaning

balance an object in between. This represents the three core elements and how they have to be balance up against each other in order to function. Additionally it works as a fun activity to loosen up and get the group to work together.

Thereafter, the first real assignment begins focusing on the first core element; play. The groups are asked to design a million dollar blockbuster game based on a theme that is common to most entertainment games, like platform, shooter etc. Participants are encouraged to think outside the box and come up with a unique game concept that stand out in the crowd of games.

The second assignment involves the meaning element. Here the participating groups draw an existing entertainment game from a pile with the task of making this game into a game with a meaningful experience. They have to implement a serious message into the gaming experience, which might deem it necessary to alter one or more core element of their given game.

The third assignment is about validity and asks the groups to identify the model of reality behind a game. In short, what this part is looking for is for the groups to come up with a real world problem or another serious subject, and then further specify their take on the domain and relate it to the real world.

For the final assignment the groups are asked to use the three previous parts and combine them into one successful serious game. Groups may choose to drop some part of each assignment or bring in some new ideas, but the main task here is to see how these three core elements complement each other or clash, and look at trade-offs to create the next best serious game. Finally, the groups are asked to present their game before the workshop is ended with a short evaluation.

The Serious Game Design Workshop attempts to both give the participants experience and knowledge skills about serious games and its design process. It focuses on the

creation of concepts rather than technology or visuals, and can very well be used for crowdsourcing ideas for a serious game.

Each of the part in the workshop has a set of worksheets to be filled out. The depth of the questions in the worksheets vary from part to part but are all quite detailed. This is done to guide the participants in creating a game.

3.2 Changes to Accommodate Privacy

The Triadic Game Design workshop is well designed for coming with game design ideas for serious games in general. However it isn't specific enough if one wants to focus on a specific area, for instance privacy. Therefore there were made several changes to the workshop to accommodate for a different target audience, focus (privacy), goal and timeframe. The core elements from the Triadic Game Design workshop with triad of Reality, Meaning and Play as the criterias for a successful serious game remain, though tweaked in several ways. A summary of the initial changes made to accommodate for privacy can be seen in Table 3.2.

Scope	Change
Target Audience	Do discussion and pitching in Norwegian
Focus (privacy)	Update Process Replace existing Reality cards with privacy-related Reality cards Remove Play Cards
Goal	Add Technology cards to allow co-design
Timescope	Remove ice-breaker activity Remove "worksheet" - replace with a board

Table 3.1: Table chowing changes from the Triadic Game Design workshop

3.2.1 Target Audience

The target group described in this chapter was originally 15-19, but has been updated to 13-19 as version 2 of the workshop tried to include secondary school students as well.

In the workshop of Harteveld the target audience is adults with English as their first language. In the Privacy Game Co-Design Workshop the target audience is Norwegian teenagers (age 13-19) who speak English, but not on the highest level. Reading basic English isn't a problem, so the cards with difficult language were simplified. The discussion and pitching is performed in Norwegian to have dialogue flow easier and not adding an extra constraint.

The teenagers are digital citizens who have a high technical understanding, and most likely play and know a lot about games. Therefore they are a perfect target group for the workshop, especially considering that the serious game that they are "designing" is targeted towards teenagers as well, making it extra relevant.

Due to the age of the participants some of the game examples on the cards had to be updated to more recent game examples.

3.2.2 Time Scope

The time planned for the workshop of Harteveld is at least half a day. The privacy workshop is supposed to be able to be performed in a classroom setting with considerably less time on hand. Therefore several changes were made, most importantly the removal of the worksheets used in the original workshop. The language in the worksheet was too difficult to be used on the target group, and would take too much time to conduct. Therefore instead we incorporated it into a board to be used by each group.

Instead of involving an initial ice-breaker activity from Hartevelds Serious Game Workshop, the focus is on putting the participants into the context of internet privacy. This is done with the Kahoot! quiz explained in section 4.1, and a short presentation by the workshop leaders on internet privacy covering the topics of: What is privacy? What is online privacy? Risks of sharing personal information with other people/friends, and Risks of sharing personal information with companies or organizations through usage of services. Doing the Kahoot! and presentation saves time, serves the purpose as a fun activity and lighten the mood, as well introducing the participants to the topic of internet privacy.

3.2.3 The Process

This section was added for this report

In the Triadic Game Design Workshop, the participant is take trough three iterations of diverging and converging. Starting with a reality problem, continuing with meaning and lastly play. This takes the participant trough cycles of ideation allowing them to think about each part separately. The different parts of the Triadic Workshop did not have to build on each other and were combined in the end of the workshop. During the Triadic Game Design workshop the participants also drew cards that they had to work to include.

In the Serious Privacy Game workshop this process has been changed as it seemed hard for the participants to keep focus on privacy while diverging and converging in the other parts of the workshop. The process therefore dictates that the participants has to build on the last part as well as keeping the privacy problem in focus of each part.

Drawing cards were also removed from the process as the cards drawn could at times make it hard to focus on privacy.

3.2.4 The Board

The removal of the worksheet means that the participants need a different place to put down their thoughts and ideas. This ended up being a board that each group receives and can write on. To have a board in a workshop can be beneficial and help the participants structure their work. The board can be seen in Appendix B. For each part the group writes down what kind of card they drew, read three Guidance Questions to help facilitate the thought process and writes down their thoughts.

Having a board helps to manage the many different aspects of the game, as well as reducing the number of components needed to conduct the workshop. Especially with easily distracted teenagers as the target group this is beneficial. The participant gets associations towards a fun board game, as well as having less distractions.

3.2.5 Reality Cards

The Privacy Game Co-Design Workshop focuses on privacy as the model of reality, whereas the Triadic Game Design Workshop focuses on a wide array of realities to focus the serious game on. For this workshop we don't want that. For that reason all the reality cards were replaced with new, privacy related, cards. They are still quite broad, so that the participants are supposed to further specify them into something they find relevant and interesting.

The reality cards related to privacy are:

- Location Sharing
- Smart Cities
- Health Devices
- Activity Trackers
- Social Media
- Mobile App Permissions
- Loyalty programs

These are broad enough to be interpreted in different directions, but still specific enough to be sure that the participants end up focusing on internet privacy, and not something entirely different. All the cards used for the workshop can be seen in Appendix B.

In addition to having a privacy related reality card the group of participants can choose to angle this towards privacy related problems on sharing with other people, or whether the problem is related with sharing too much with a corporation. This way the participants can choose to make it even more connected to their own reality.

3.2.6 Play Cards

This section was added for this report

The Triadic Game Design workshop included a set of Play Cards describing different game genres. These were removed to streamline the process and save time. The groups choose a game to work with earlier in the workshop and will just be inspired from this game instead of drawing a Play Card requiring more time and taking the focus from the goal of the workshop.

3.2.7 Technology Cards

Another adaptation that has been made is to add "Technology Cards". These are cards that specify what kind of technology the serious game will be utilizing. This is to help facilitate the thought process further for the participants. Having a specific technology to design the game for opens a lot of opportunities, and may help the participant to move away from the typical PC games. It can be argued that introducing yet another card complicates the workshop process further, but the positives outweigh the negatives. Additionally, using technology cards requires that the participants have a good knowledge of existing technologies - which is well suited for teenagers as participants.

The technology cards are introduced in the final phase of the workshop, when the participants are combining all the previous phases into one successful serious game. The technology cards are shaped as a T, and have the following titles:

- Augmented Reality
- Virtual Reality
- Mobile
- Computer
- Console
- Interactive Surfaces
- Interactive Devices

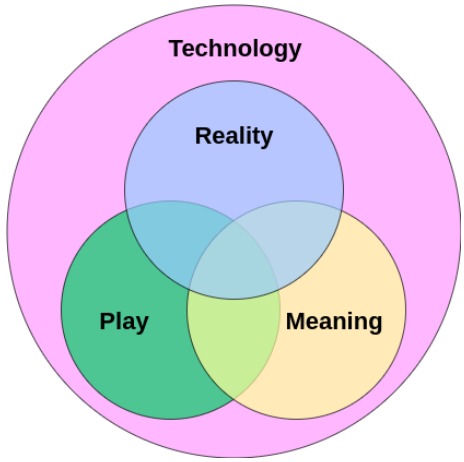

Figure 3.2: The triadic game design within the context of technology

3.3 Guide to running the workshop

This section describes the approach used in the final run of the workshop, LSS5, as described in section 7.4.

3.3.1 Workshop Pieces

The workshop consists of a board split into the four parts of the workshop, Reality, Meaning, Play and Technology. In addition the the board, the workshop has two types of cards; category cards and question cards. All assets can be found in Appendix B.

Category Cards

The workshop has three types of category cards; Reality, Meaning, and Technology cards. The Reality cards presents privacy issues. There is only one Meaning card, Awareness, presenting how to raise awareness through a game. The last type of category card is Technology card. These cards presents some technologies the game can be created for. Some of the category cards can be seen in Figure 3.3

Figure 3.3: Category cards used in the workshop

Question Cards

There is one Question Card for each of the four parts of the workshop. The cards provides a place for the groups to write down their thoughts. The cards also provides some guidance questions to help the group process. The question cards can be seen in Figure 3.4.

Figure 3.4: The question Cards used in the workshop

Board

The board is split into the four parts of the workshop, and has covers that hides the cards for each part. The covers provides a way of controlling the groups progress and adds a game-like feeling to the workshop. On the inside of the covers, instructions for what to do in the current part is given. The board can be seen in Figure 3.5.

Figure 3.5: The workshop board with instructions

Poster

To show of the game ideas in the final presentation, the question cards can be taped to the question cards forming a poster. This gives the groups something to show and a

goal for the workshop, to complete the 5 pieces of the poster. An example of a poster can be seen in Figure 3.6.

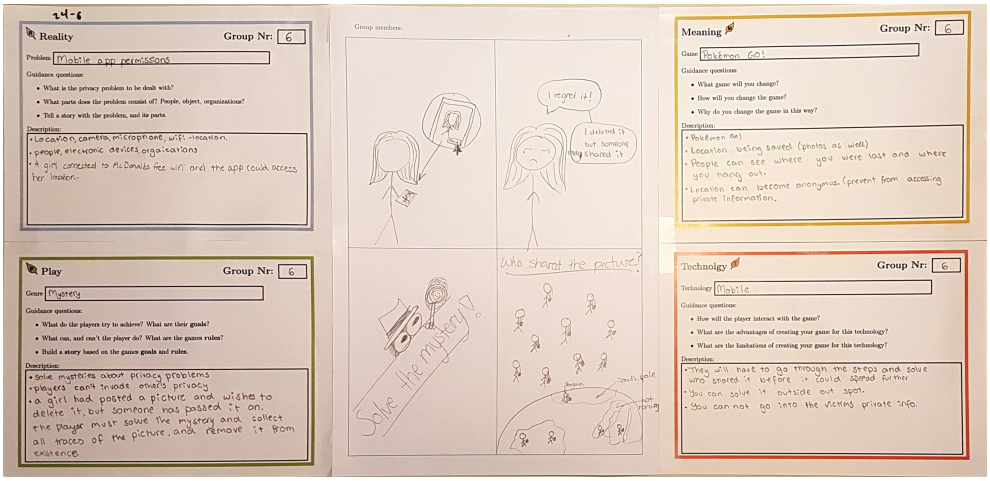

Figure 3.6: The workshop poster put together from the question cards and drawing.

3.3.2 Workshop Schedule

This section introduces the suggested schedule and gives an introduction to each activity. The schedule is designed for classes of 16-24 students with groups of 2-3 students. It is suggested to run this workshop with groups of 2-3 students to avoid "freeriders", but facilitators familiar with the groups they execute this workshop with should chose groups based on their own judgment.

The schedule should be adjusted to need. It is desirable to maintain the presentations as it allows a look into the groups thoughts, making guiding the groups easier. If time is limited executing the workshop over two days should be possible with the first presentation as a natural point of stopping the first session.

Each group will spend different amount of time on each part. The facilitator must take the groups progress into account and either give the groups more time or move on earlier than planned. If it is necessary, can the groups start working on the next part while the other groups finishes up the last part.

Introduction

Estimated time 15 min

To give the students some basic knowledge and understanding of privacy issues, a short presentation should be held before the workshop. This can be done as a short 15 minute

presentation just before the workshop, or if possible, by having a lecture about privacy issues before the workshop. The introduction should present what privacy is, what it looks like online, and why it is important. In Appendix C is an example presentation. It includes two short videos explaining privacy and news articles related to each of the Reality cards.

If a lecture about privacy is given as a separate lecture, it is still recommended to present the privacy cards with news articles just before the workshop is held. Alternatively, the students can be given an assignment to read a news article and thing of a privacy issue as homework or class activity before the workshop.
Some resources for presenting privacy:

- Daniel Solove has written an article detailing ten reasons why privacy matters[2], it is recommended to have a look at it.
- GDPR has defined a list of special categories of personal data[3]. They can also be called sensitive personal data, including data such as health data, sexual orientation and other sensitive data.
- UN's Universal Declaration of Human Rights Article 12 is about privacy [4]
- The website of Serious Privacy Game workshop [5] can also be consulted for activities and material related to privacy.

Part 1 - Reality

Estimated time 25 min

In the first part of the workshop, Reality, the groups shall identify a privacy issue. This issue will be used during the rest of the workshop. To help the students select an issue, privacy cards are given to each groups and the students can select one of them. The groups should already have been presented with the issues and some examples of the issues.

The goal in this task is to create a situation / scenario that illustrates the privacy issue and can be used to build a game. The students are therefore allowed to combine or create own issues in addition to the issues on the Reality cards.

The question card tries to guide the groups by thinking of what creates this issue.

This part is longer than the others as it normally takes longer to get started and because creating a good privacy issue affects the rest of the workshop. If the groups have problem selecting a card, they should be instructed to make a decision within 5

[2] https://teachprivacy.com/10-reasons-privacy-matters/
[3] https://gdpr-info.eu/art-9-gdpr/
[4] http://www.un.org/en/universal-declaration-human-rights/
[5] http://sprigwork.shop/

minutes of this task to avoid that they spend all their time doing this choice. The groups should have started writing down something to the question cards within 15 minutes of starting this part as to force them to make their ideas more concrete.

Part 2 - Meaning

Estimated time 20 min

Part 2, Meaning looks at how to raise awareness of the groups privacy issue by modifying a game the group enjoys. As in the first task the groups should have selected what game to modify within 5 minutes, and started writing within 15 minutes. After this part there should be a short presentation, it is therefore necessary to remind the groups of presentation 5 minutes before the presentation. The presentation should shortly explain the groups privacy issue and what changes they made to a game to raise awareness of this issue.

The changes done to the game should result in changed interaction by the player. Adding a warning before playing the game is not what we are looking for in this task. Changing something so that the player has to think of privacy to avoid penalties or gain points by exploiting the issues is closer to what we want. The groups should be allowed to change the games how they like, but they should be facilitated so that the changes results in a "new" version of the game they change.

Presentation 1

Estimated time 10 min

In the first presentation each group should percent their privacy issue and how they modified a game to raise awareness of the issue. If the workshop is run to create ideas for games that will be created or for an older audience, having two and two groups present their ideas and give feedback, can be an alternative activity. The presentation should be short and the groups can use their questions cards to present, but they do not have to read everything on them. Presenting the ideas fast so the facilitator know the status and to give the other groups some more ideas to play with is what is important. Presentation time depends on number of groups.

Part 3 - Play

Estimated time 15 min

In part 2 the groups modified an existing game. In part 3 the groups will create their own game focusing on the privacy issue. It can be further development of the previous

part, or it can be something completely different. The game should focus stronger on the privacy issue than the last part and will therefore often be less fun. This might be hard for the students to compromise on this.

To make the games easier to explain, providing the groups with a piece paper divided into four or more parts. This paper can be used to draw a "story board" or "cartoon strip". This allows the students that likes to draw to express themselves, as well as it makes the ideas less abstract and easier to communicate. This paper combined with the question cards can be used later to craft a poster of the groups idea.

If there is time this step could be extended. The groups can do much in this step. But the next part will allow the group to work the idea a bit more so the estimated time should be enough.

Part 3 - Technology

Estimated time 10 min

In the final part, the groups figures out how their game should be played. In this part technology cards is introduced to suggest some platforms the games can be created for. The groups can choose a combination or something else. The groups can create analog games such as card, or board games if they would like.

This part allows the groups to finalize their ideas and figure out how the player interacts with the game.

During this part, tape can be handed out to the groups to start assembling the poster before the presentation. As there is a presentation after this part, notifying the groups of the presentation 5 minutes before can help them use their time better.

Presentation 2

Estimated time 15 min

In the second presentation the groups should repeat their privacy issue, it might have been changed slightly during the workshop. After repeating the privacy issue the groups should present their game idea and why it raises awareness of that issue. The poster gives the groups something to show of while talking.

Chapter 4

Preliminary

4.1 Kahooth

This section, except for discussion, was written in the collaboration described in Section 1.3.

To understand what secondary school students know about privacy and how much they care, a Kahoot! accompanied by a questionnaire was designed and run.

Kahoot! is an engaging game platform for running multiple choice questions[1]. The participants use a computer or a mobile device to play the game. The questions is shown on a big screen and up to four options is shown on the participant's devices buttons for each option is shown. Part of the game is to answer as quickly as possible. The participants gets less and less points as time goes. There is normally a short time limit of 15 seconds to answer the questions. After the time runs out or all students has answered the correct answer is shown and how many answered the different options is also shown giving the one running the Kahoot! a possibility to explain the answer. After the answer is show, the top participants is shown.

The kahooth and questioner was run at School A connected to another workshop and again in the pilots of the privacy workshop.

4.1.1 Purpose

The purpose of the Kahoot! and the questioner was to understand more about what secondary school students knows about privacy, and how much they care. The combination of Kahoot! and questioner was chosen as trying to engage the students was important for the team. The team did not want to give the students page after page

[1] https://kahoot.com/what-is-kahoot/

with questions. The Kahoot! also gave the team the possibility to explain the questions that many got wrong and answer relevant questions.

To make an engaging Kahoot!, the team did not want to design scale questions or other questions gathering background information. It is not interesting for the students to see the results, they don't learn much from it and there is nothing to really explain about the questions. The Kahoot! questions were therefore designed to understand what the students knew about privacy by asking questions connected to privacy.

The Kahoot! itself also acted as a prototype of a serious game about privacy. Observation of the participants engagement and challenges with the Kahoot! were therefore recorded.

The questioner was added to gather background information of the participants. What types of digital services they use and about how much they care about privacy.

4.1.2 The Questions

The purpose of the Kahoot! and its accompanying questionnaire is to study what secondary students know about privacy and their attitude towards it. The questions chosen for the Kahoot! cover different aspects of privacy. Some questions cover what is okay and not to share with friends on social media, i.e what type of pictures to post (Q9, Q10, Q11). This is something we expect the participants to already know. Another question, Q6, looks at how much the participants know about what companies are able to do with their information, to test the participants knowledge on this area.

Some questions checks how much the participants know about how and what information companies can gather from the user. These are interesting questions, that hopefully can surprise the players with how much information actually can be collected (Q2 Q5 Q8 Q12). One question, Q3, asks about terms and conditions and Q4 asks the players about the definition of privacy. These questions, in companion with Q7, are questions about privacy in general.

The intent is not to make the Kahoot! too easy, nor too hard. The questions, and their order is intended to not always make it obvious which answer is the correct one - and that not always the most "scary" answer is correct.

4.1.3 Procedure

The kahoot! is run on a big screen visible to all participants. The participants enters the Kahoot! with a computer or mobile device using an anonymous id generated from repeatable base information. The first questions is just to make sure all participants have understood the game. After each questions too many chose the different options is shown on the big screen and the answer is explained and related questions is answered. The question - explanation cycle is repeated until all questions have been asked.

After the Kahoot! the participants get the questioner and spends 5 minutes filling out base information.

These activities were used as an icebreaking activity in the privacy workshop as the participants in these workshops are students that knows each other. An activity that requires participation and thinking about privacy were therefore deemed suitable.

4.1.4 Participants

The participants of the Kahoot! and questionnaire were all secondary school students from the Trondheim area.

In the first run there were 38 students participating. In the pilot workshops there were 3 students in the first and 6 students in the second.

4.1.5 Results

The results from the Kahoot! shows that overall 42% of the questions were answered incorrectly. The question with fewest correct answers was question 6: "Can snapchat sell your pictures and location?", where only 25% answered correctly. According to the privacy policy of snapchat any content provided to them by using their service can be distributed to third parties without them having responsibility for how the third-party uses the data.

The question with the second fewest correct answers with 36% is question 8: "Does Facebook know what (other) websites you visit?". However this is only so because the majority believe facebook is aware of all web-pages visited on the internet.

Generally the participants show a good understanding of what type of information shouldn't be posted on social media through images, know that the terms and conditions of a service is binding, and how mobile applications have access to location information.

Full results, and questions of the Kahoot! can be found in Appendix D.

During the Kahoot! the authors observed that the students were very engaged and seemed to enjoy the game. In an interview after the Kahoot! one of the participants said that: "I think it was very good that you explained [the questions] afterwards. It made it more educational".

Another participant chimed in: "You won't learn anything if you don't make any mistakes"

The answers from the questionnaire following the Kahoot! shows that 61% of the participants think they know enough about privacy, and that 62% isn't interested in learning more about it. Surprisingly 34% reply that they don't share personal data online, when even a person's IP-address can be considered personal data[2].

[2] https://www.datatilsynet.no/om-personvern/personopplysninger/dynamiske-ip-adresser/

Finally, 46% of the participants respond that they have learned something from playing the Kahoot!, whereas 32% are unsure. When asked “Do you think you will be more aware about privacy in the future?” 40% respond yes, and 33% maybe.

The results of this Kahoot! indicates that the majority of the participants knows that facebook under certain conditions know information you do not tell them directly, such as what phone you use. The majority also thought that Facebook knows all websites you visit on the internet. They seem to understand that terms of conditions are binding. The results also indicates that the participants have an understanding of how app permissions works. What applications can do with the information collect was less understood by the participants. There seemed to be some understanding of information not to share through images. The majority understand that even though you might be anonymous to others you are not anonymous to the services you use. And that they can under certain circumstances relay your information to authorities.

4.1.6 Discussion

This section was written as part of this thesis and not of the collaboration.

The Kahooth! created engagement in the class it was executed. Some students were surprised by the answers. In general the students seems to know what happens when they install apps, and have some understanding of how terms of service use works, based on the results to a question about posting a statement revoking Facebooks right to the content you post on Facebook. The students also seemed to understand that they are never really anonymous on the Internet. They did not seem to know what services like Snapchat and Facebook can do with the data they collect.

There were some problems with using Kahooth! to collect data, and the questions in general. Some answered to soon because of the time limit. We know this as they stated so just after answering wrongly. Some of our questions were vague, or long to read, or more related to security than privacy.

The Kahooth! can be viewed as a game in itself, and in such was our first try at a game designed to raise awareness. This did to some degree succeed. The students seemed to learn something. But, what they got from the Kahooth! were more related to security than privacy. This was because it was hard to create questions related to privacy issues that could be presented in a Kahooth!. Our understanding of privacy also affected the questions.

Doing a short lecture then follow it with a Kahooth! could have been more effective. This would have made it easier to create good questions related to privacy issues.

Chapter 5

Pilots

This chapter was written in the collaboration described in Section 1.3. Section 5.1, Purpose, and Section 5.2, Data Collection, was added to frame the chapter.

5.1 Purpose

To test the changes made to the original workshop, the team wanted to run pilot workshops in order to evaluate the implemented alterations. Using a sample size of the intended target group let the group assess feasibility, time usage and the knowledge and interest of the participants. For the researchers, the pilot also functions as practice and training for future executions. The pilot was expected to uncover new desired changes prior to a full-scale workshop in an attempt to avoid waste of time and money. It is important to note that even though pilot testing is an established method for evaluation, results should be interpreted with caution.

5.2 Data Collection

To make purpose of the pilots towards altering the workshop, it was important to collect data during the executions. Data was collected across four dimensions; a questionnaire, an audio recorded group interview, observations made by the researchers and results written on the board by the participants. All three researchers were part of running the workshop and made parallel observations that later were combined with written results and discussed in the team. It was important to have the participants do the questionnaire right after the workshop ended and before the post workshop discussion, in order to let each participant share their personal thoughts before being biased by other participants. The questionnaire consists of 10 questions in total, asking about the

participant's learning outcome, how entertaining they found the different parts (a fun-rating of 1-5) and the difficulty of the workshop. The last step of the data collection was an audio recorded interview where all participants joined in. The researchers sought to have a free flowing group discussion, without a structured set of questions in order to lower the threshold for input and not constrain what the participants might say, as discussed in repacking privacy. After each pilot the researchers sat down together and combined the data before making a qualitative analysis, that resulted in suggestions for changes.

5.3 Pre Iteration

Before running the first pilot, some feedback on the workshop was gathered from fellow students. Two students were asked to follow the steps in the workshop quickly. This was done to see if there were any major problems with the board or the other pieces and see if the information we were planning to give was enough to understand what to do in the workshop.

5.3.1 Workshop pieces

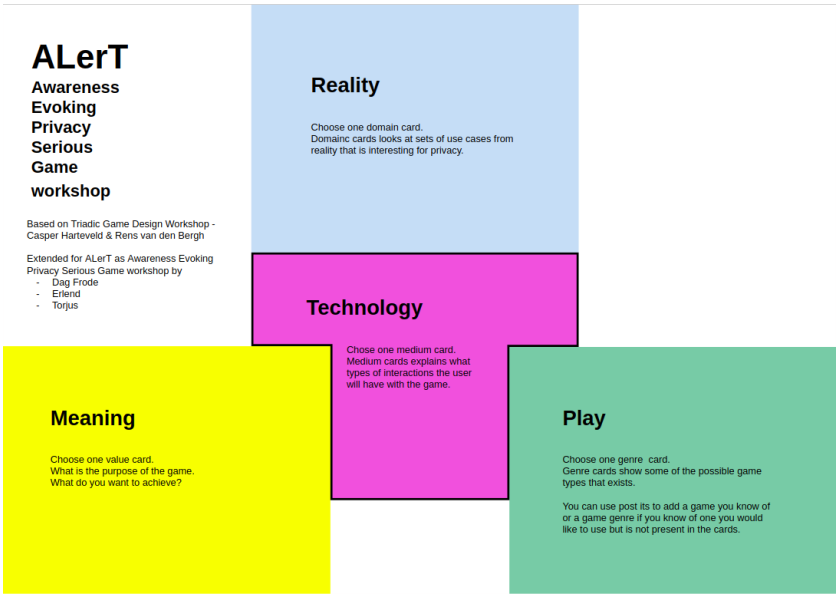

Figure 5.1: The first iteration of the instruction board.

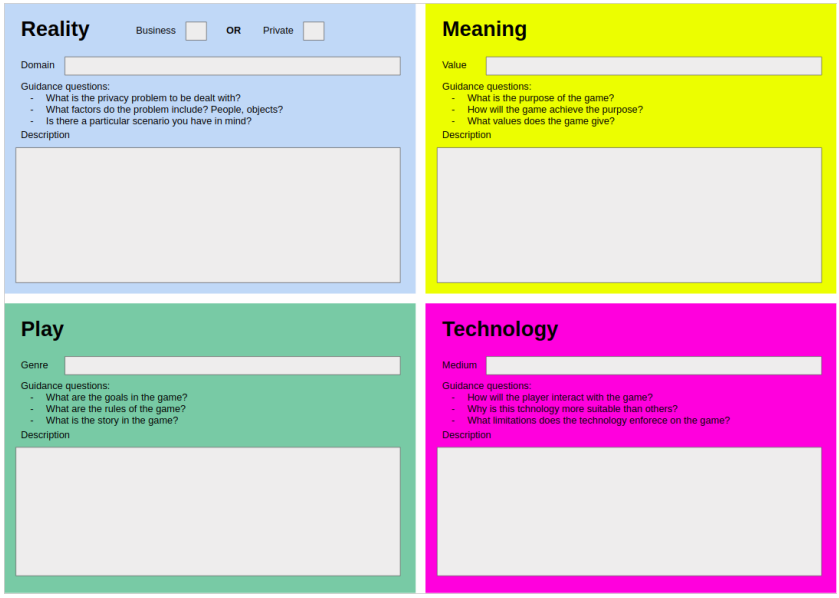

Figure 5.2: First iteration of workshop question board.

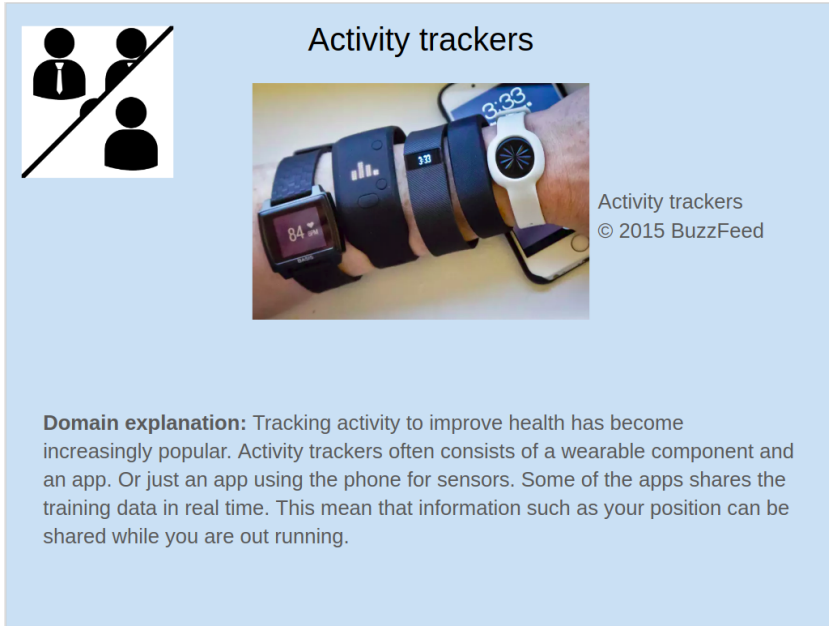

Figure 5.3: First version of Reality cards

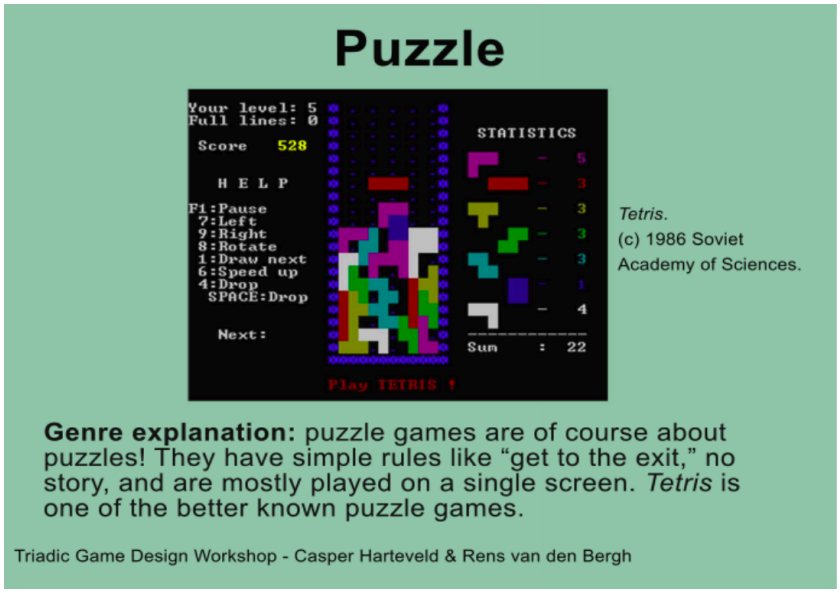

Figure 5.4: Play cards continued from the Triadic game design.

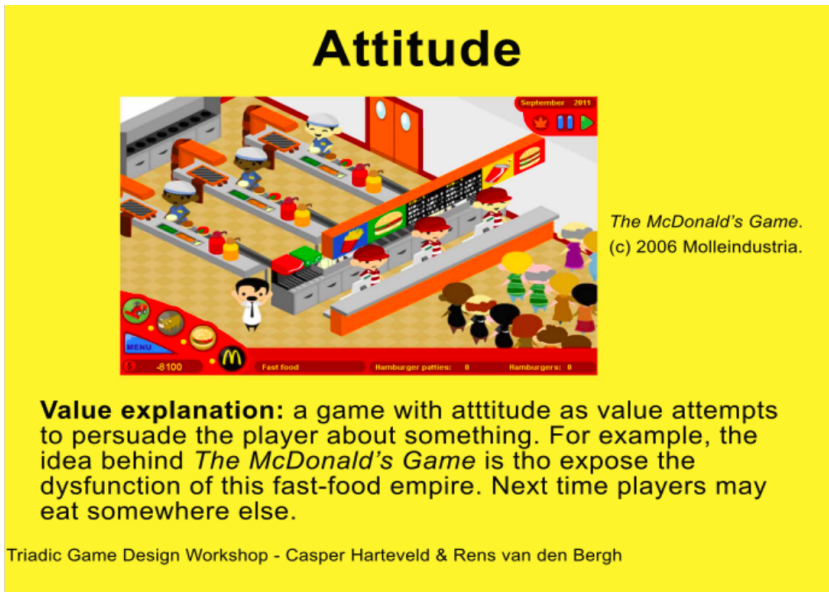

Figure 5.5: Updated Meaning Card, based on TGD

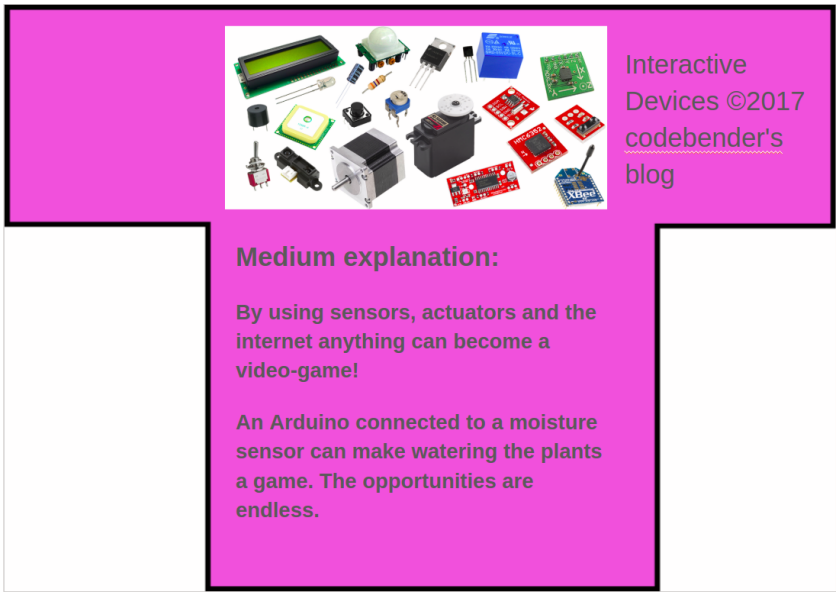

Figure 5.6: First iteration of technology cards.

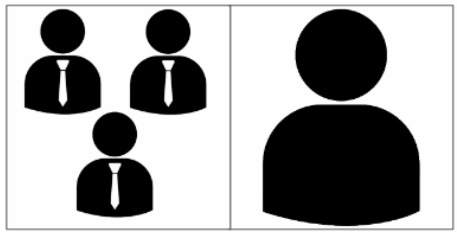

Figure 5.7: Business / Private modifier for reality card

At this point the board had two parts; The workshop instruction board where the instructions of each part was displayed and where the selected and draw card were to be placed, and the workshop question board where the notes from the workshop were to be written down. A blank A3 sheet was cut into 4 and taped to the workshop question board and numbered from 1-4 corresponding to the different parts. The participants had to open each part at a time as they were going through the workshop.

5.3.2 Results and Observations

The feedback collected here was that they understood the instructions and the workshop pieces well enough. They did not get an introduction to privacy before the workshop and spent about 20-30 minutes completing the workshop. The participants seemed

to find it fun and liked that it made them think. The participants stated a lack of connection through the workshop and the questions on the workshop question board. Placing the cards on the instruction board was inconvenient as it blocked the instructions. The instructions on the workshop instruction board could be clearer. The participants suggested that an introduction to privacy would be useful. This was already planned to be a part of the workshop, but not part of this test as it were to be kept short and identify major problems. This request confirmed that such an introduction would be useful.

5.3.3 Changes

As a result of the direct feedback and observation of the participants several changes were made to the workshop:

Change	Reason for change
Move the workshop instructions to the pieces covering the workshop question board.	The instructions was covered when the participants placed the card on the workshop instruction board.
Update the questions on the workshop question board. Making the first question related to privacy.	The participants reported a missing thread through the workshop.
Made the workshop instructions clearer and added a workshop cycle.	The participants were a bit confused about the instructions and the flow of the workshop. The instructions were therefore reworked to be clearer and a workshop cycle was added to explain the steps do be done for each part of the workshop.

Table 5.1: Changes made to workshop version 0.0

5.4 First Iteration

The first pilot workshop was ran with three participants from the second level of Norwegian high school students (VG2). As there was only three participants they were all put into the same group.

5.4.1 Workshop pieces

The updated workshop pieces are shown and named in figures 5.8, 5.9, 5.10.

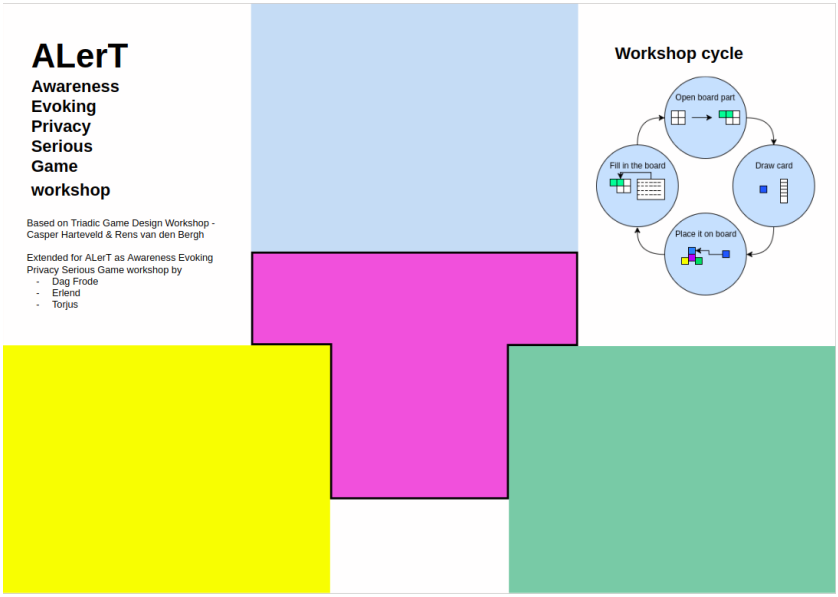

Figure 5.8: Card placement board

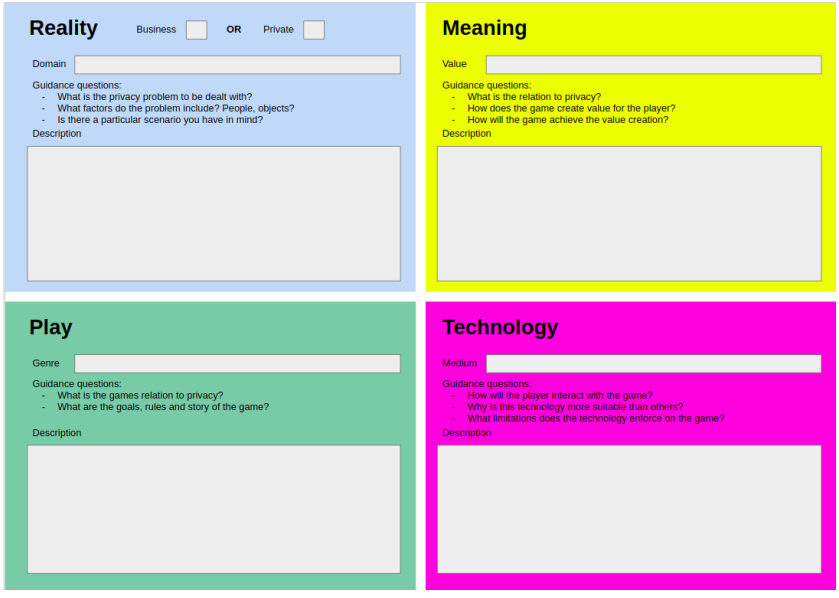

Figure 5.9: Improved question board

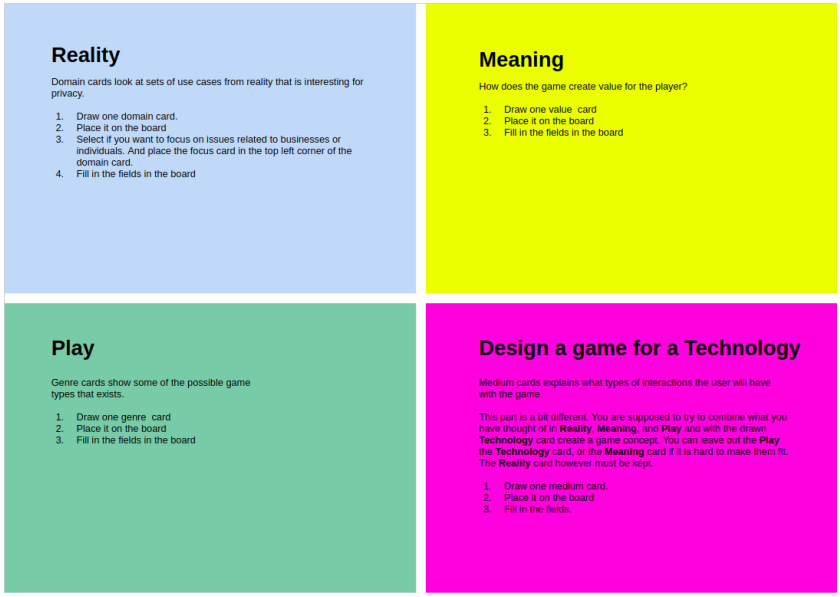

Figure 5.10: Question board cover with instructions.

5.4.2 Results and Observations

For part 1 (Reality) the participants drew the card Application Permissions. The group had trouble understanding what they were expected them to come up with, and were more concentrated on figuring out the privacy issues of Application Permissions. They seemed very locked to the examples and questions written on the card. Observations made indicates that this part was one of the hardest, and this is reflected in the questionnaire where it scored lowest on entertainment value.

In part 2 (Meaning) the group drew the Attitude/Awareness card and came up with a game based on the actual game Grand Theft Auto, they gave the game meaning by focusing it on corruption in society. The player's actions would affect how the story develops in a tree of possible stories. In hindsight the drawn card was rather fortunate for two reasons; the workshop looks to give ideas to awareness-raising serious games, and the other cards were difficult to combine with privacy.

In part 3 (Play) they drew Shooter, but decided to re-draw as it was to broad and got Simulator. The group decided on creating a walking simulator, with as few rules a possible where you can interact with "everything". The game would use comedy as a factor to engage the player.

In Part 4 where they were supposed to combine the three previous parts they drew their technology to be Virtual Reality. They found it difficult to combine app permissions into the walking simulator game. After some discussion they decided to have the

player be the attacker who tries to exploit other people and get their information. In the questionnaire two out of three participants stated that they had a hard time combining all parts.

The participants did get stuck on several occasions on different parts, where they were helped along with questions to start them thinking. This would be a lot harder was this pilot run in a classroom with several groups. They also got very caught up in the examples presented on the cards, and had a hard time detaching their ideas from the examples.

Questionnaire results shows that the participants enjoyed the workshop, giving each part 2, 3 and 4 between 3.66 and 4.33 out of 5 in the fun-rating. Their answers suggests part 1 (Reality) was the most boring, with a fun rating of 3.33, and most the most difficult to combine with the other elements. They all stated that they had sufficient time for each part, and that they are more aware of privacy after the workshop.

Group Discussion

The final step of the first iteration was an open discussion with the participants which was recorded. Their thoughts reflected the observations made during the workshop. The main concern of the participants was the difficulty to put together all the previous steps in the final game, especially the scenario from the reality part was difficult to include. They felt that it was too random of a combination of elements. The participants seemed positive to the idea of being able to chose their own reality card.

The participants were asked "What was the most difficult part [of the workshop]?":

"Combining everything! Definitely. Combining three of the parts wasn't difficult, but getting 'Reality' to fit in was very challenging."

When shown the other possible reality cards the participants said:

"I see that for instance 'Smart Cities' would be easier to create something interesting out of. The difficult part is to make the privacy an essential part of the game while still keeping it interesting"

Since the participants were "lucky" and drew attitude in phase 2 of the workshop, meaning, they were shown the other meaning-cards and asked how it would have been with them. The general consensus was that many of the other meaning-cards were too difficult to understand, and that "attitude" was the meaning-card best related to privacy risks. Many of the meaning cards wouldn't make sense in the given context.

5.4.3 Changes

As a result of the observations, questionnaire and discussion with the participants several changes were made to the workshop:

Change	Reason for change
Participants get to choose Reality-card.	Combining all the elements proved too difficult, and Reality the most difficult one to incorporate. By letting the participants choose reality card it will be something they understand, as well as providing information about what kind of scenario they find interesting and relevant.
All Reality-cards are presented at the beginning of phase 1.	By letting the participants choose Reality-card they need an introduction to all the cards, as they won't read all the information on all cards. This lets them make an informed decision and further teach different privacy risk scenarios.
Change Meaning card "Attitude" to "Attitude and Awareness" and re-write.	The participants in the pilot understood attitude to include awareness, and adding the word to the title and re-writing the card further drives home the point.
In phase 2, Meaning, the participants are given the "Attitude and Awareness" card, and can't choose anything else.	The previous version of the workshop was aimed at trying to give many different meanings, for instance improving "Motor Skills". Those are not relevant for this study, as it is mainly focused on raising awareness.
Remove elements from the board and modify layout.	Half of the board used in the initial pilot workshop was not utilized by the participants. Removing it and changing the layout of the board makes it smaller in size and have fewer loose items. Having the unused parts of the board covered hopefully helps the participant focus on the current phase and task. See Figure XX.

Table 5.2: Changes made to workshop version 0.1

5.5 Second Iteration

The second pilot was run with four students from level 1 and two from level 2 of the Norwegian high school (VG1 and VG2). They were divided into two groups, Group A and Group B, placing the VG2 students in separate groups.

5.5.1 Workshop pieces

Figure 5.11: Updated reality card. The individual / business selector was removed.

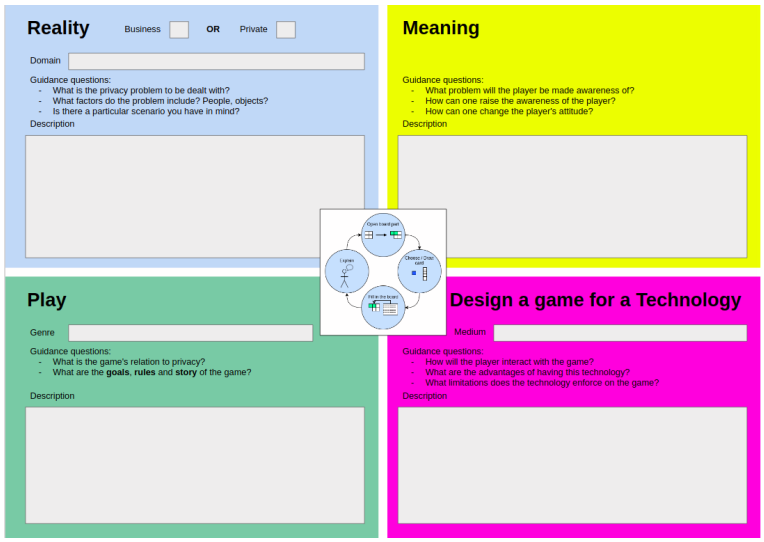

Figure 5.12: Workshop question board was updated with the workshop cycle in the middle as the workshop card placement board were the workshop cycle was before was removed.

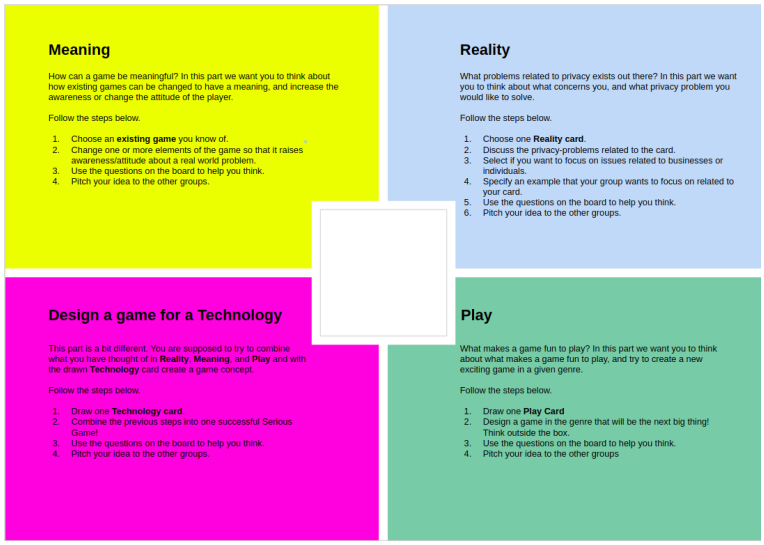

Figure 5.13: Workshop question board cover was updated based on feedback of the instructions as well as to tune how the participants were guided. A hole for the workshop cycle to be displayed through were also introduced(The board was flipped to make sure the hole were placed correctly).

5.5.2 Results and Observations

This time the participants got to choose their cards in part 1. Group A chose smart cities as their reality card, and the scenario they discussed was hacking of all the data shared, and the resulting fatal consequences. Group B chose social media, as they found it most relatable and easy to discuss, and opted for hacking and selling personal information as their scenario.

For part 2 in this iteration, both groups were given the new “Attitude & Awareness” card according to changes made after pilot 1. Group A came up with a restaurant game, where you can get xp from donating food to people in need. The group was very influenced by the picture of the example game on the card (The McDonald’s Game). Group B came up with a game where the player’s actions will change the story of the game, showing the player consequences of his actions. Their problem was sharing of data. Even though they did not need to involve privacy in this part they still did, showing that the task could be clarified further. The parts of the workshop are supposed to be separate, but the participants are not discouraged from considering privacy in every step if they choose to.

For part 3, group A drew “Strategy” and created a mafia game where you are the boss and controls an army of street thugs. Group B drew “Geo Location” game, chose to re-draw, and ended up with pet-raising simulator. They struggled a bit to understand

the re-draw, but came up with a “GTA-like” game where you are a dog that has to work his way through the day in a dog’s life. This part is not relevant to the problem, but like in pilot 1 it is very much enjoyed, and simplifies part 4 for the participants.

In part 4, group A drew “Mobile Phone” as game technology. They believed this would not restrict the game all too much with today’s powerful devices, and at the same time open up for playing the game wherever you are. They included all their previous parts by creating a mafia game, where you hack the smart city grid and use this information to make money by blackmailing and other illegal activities. The player must also be careful in sharing data as the smart city devices can detect his actions and movements and alert the police. That way the player will learn about privacy in smart cities, and be more aware of what he shares in real life. Group 2 created a social media simulator, where each action the player makes has consequences in a fake social network, where the story is always changing based on the choices the player makes. This teaches the player consequences of poor privacy actions. They had to be reminded to use the questions on the board to help them along.

All in all the observers felt that the second pilot ran smoother than the first, and that they had to help the participants with less questions to get them started.

The questionnaire reveals that in the second pilot all 6 participants claimed that they had learned something about privacy. Part 1 was once again the least popular with a fun-rating of 2.67, and the part they needed the most guidance to start thinking. The participants appreciated the presentation of each reality card before they started, as opposed to pilot 1 where they drew a card blindly. This time no one answered that part 4 (combining all previous parts) was hard as opposed to 2/3 in first pilot. The fun-rating of part 4 was also higher than on pilot 1. The groups felt they had sufficient time on each task, supporting the results from the first iteration. On a scale of ‘very easy’ to ‘very hard’ the responses were all somewhere in between, which is desirable.

5.5.3 Group discussion

The two groups were involved in an open discussion about how they thought the workshop worked which was recorded. The participants were in general positive to the workshop. They found that coming up with ideas and combining them in the final stage to be of an appropriate level of difficulty, which confirmed that the changes made from the first iteration seemed to make combining the elements easier. The participants said it was a fun challenge to combine all the previous elements with a technology in phase 4.

One of the participants stated that:

“It was nice to be able to choose [reality card]. It made it easier to come up with interesting angles. The ‘Play’ part was more difficult since the genres were untraditional and we had to think outside the box.”

The coordinators asked “Is that a bad thing?”

“No, creating yet another Call of Duty [1] would have been boring. It was fun, but challenging.”

The participants had the time to look at and go through all the cards, and gave feedback on words or formulations they found too difficult or out of place. When asked about phase 1 the participants seemed pleased to be able to choose Reality-card, and confirmed the belief that a brief introduction to each card/scenario was necessary because they would’t read through everything.

5.5.4 Changes

Workshop

Change	Reason for change
Small changes in formulation on some cards and board.	The participants went through the cards and marked words or formulations that they didn’t understand or like.

Table 5.3: Changes made to workshop version 0.2

Questionnaire

Change	Reason for change
Add an ID for each participant, which also indicates which group they belong to.	Doing the workshop with multiple groups illuminated the problem that it wasn’t possible to relate the questionnaires with which group the participant belonged to. To make this link may prove to be beneficial.
Add question(s) to the questionnaire about game habits of the participants.	Learning about the game habits of the participants will help map the correlation between game interest and workshop satisfaction.

Table 5.4: Changes made to workshop questionnaire version 0.2

[1] Foot note: Call of Duty is a very successful first-person shooter game franchise.

Chapter 6

Workshop version 1

6.1 USS1

Section 6.1.4, result and Section 6.1.5, discussion in this section was written within the collaboration described in Section 1.3

6.1.1 Purpose

The purpose of this first run was to run the workshop in the intended environment. We had already run it on the intended target group in small groups. It was time to find out what problems we had not tough of when running the workshop in bigger scale.

6.1.2 Participants

The workshop was run separately for two classes, first and second year ICT. Out of the 32 participants only one was female. The classes had had some privacy discussions before as sharing of unwanted pictures of teachers and students had been a problem. The classrooms had a standard layout with rows of pairs of desks with a board in the front of the room with a projector. The teachers of the first class came and went trough the workshop. The teacher of the second workshop stayed and asked questions and interacted a bit with his class.

6.1.3 Data Collection

Data was collected in the same way as in the pilots with the same questioners with just minor modifications to clarify the answers and to get additional information to some interesting yes/no questions.

6.1.4 Results

Demographic

The participants reported in a survey which digital services they utilize, and the results can be seen in Figure 6.1. The results give us an understanding of which digital services the participants use. The most popular are social medias, direct message / voice services, streaming and video platforms, and mobile payment services. This shows us that the participants are experienced digital users across multiple platforms.

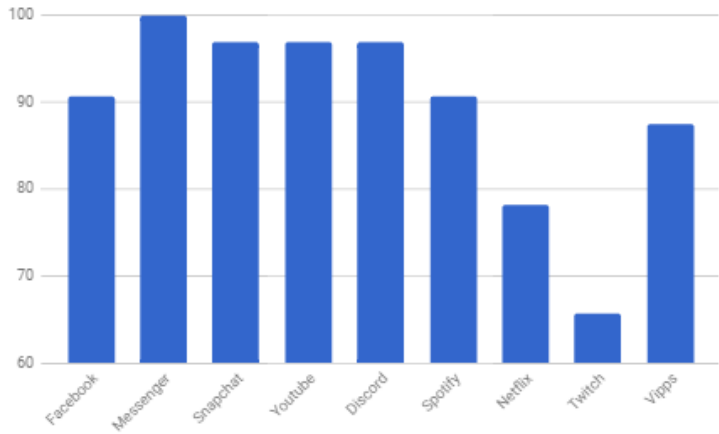

Figure 6.1: Top 9 most used services. Represented as % of participants.

The participants also reported whether they think they know enough about privacy. Only 1 out of the 32 participants state that he doesn't know enough about privacy (see Figure 6.2). The results from the Kahoot! to test their knowledge on privacy show that only 64% of the questions were answered correctly.

Overall Experience

After the workshop was completed feedback were collected from the participants to understand how the participants experience were. A score from 1-5, 1 Very boring, to 5 very entertaining were rated for each of the parts of the workshop and for the overall experience.

The participants seemed to enjoy the workshop and worked well with the tasks (see Figure 6.3). They had however to be frequently reminded to write down what they were thinking.

The pitches held after each part brought laughter to the students and it seemed that they both enjoyed telling about their ideas and listening to what the other groups did. Some of the students presented their ideas very well, explaining the context and idea

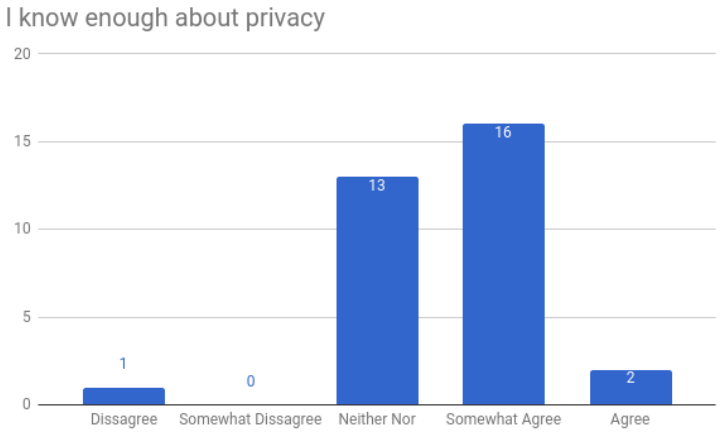

Figure 6.2: Responses to the question “I know enough about privacy”.

in a easy to understand way. Some of the presentations were a bit harder to follow with a bit to much focus on single parts and poorer explanation of the context. Questions were asked during the pitches to facilitate the pitching and clarify details. Some of the pitches only got some clarifying questions at the end while others got more questions during the pitch to facilitate the pitching.

The workshop seem to hit a good difficulty level based on the results displayed in Figure 6.4. With most of the participants reporting the workshop to be neither easy nor hard, while about 22% found the workshop to be easy or very easy, and about 6% found it to be difficult.

Evaluation of game ideas

Evaluation of the game ideas created in the workshop were done when the groups performed their final pitch. Each of the facilitators independently rated the groups across different rating criterion. The average of these scores can be seen in Figure 6.5. The aspects rated were:

Privacy Scenario, how well defined the problem statement / scenario was. Did they think of the different roles, why it is a problem, and give a scenario that illustrates their problem.

Raising Awareness, did the participants find a problem to promote awareness for? Did they find a game, and did they modify it in a meaningful way?

Entertainment Value, did they define goals, rules, and story for the game? Did it seem like a fun game to play?

Innovative, did the group come up with a creative new game concept? Did they combine existing concepts in an interesting way?

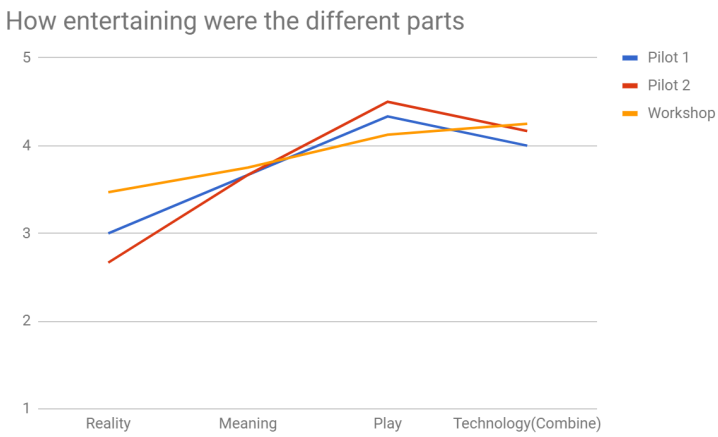

Figure 6.3: Fun-rating of the workshop parts were on a scale from '1: Very boring' to '5: Very Entertaining'

Overall Impression, the raters subjective over all impression based on the other aspects.

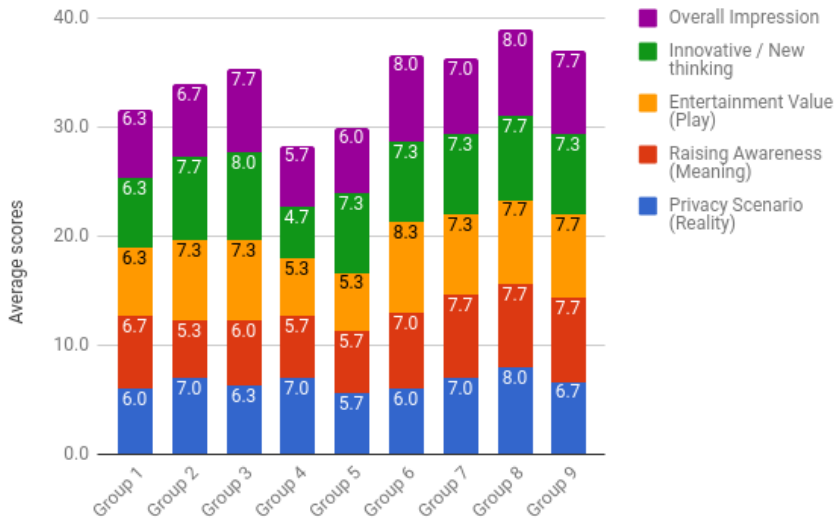

Figure 6.5: Graph showing the average scores for each group in the five aspects they were rated.

The maximum score was 50 points. The highest score given were 39 and the lowest just above 28. Most of the scores were in the mid 30's range. Most of the groups scored

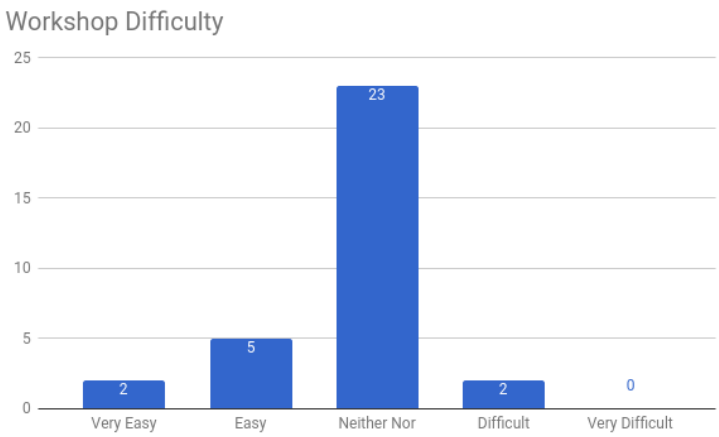

Figure 6.4: Self reported difficulty for the workshop.

high on innovative thinking with 7 of 9 groups with a score of more than 7 out of 10.

Cards chosen

In the workshop execution we observed that a majority of groups selected social media as their reality card, while smart cities and app permissions also were popular choices. There can be different reasons for choosing a certain card, as the participants might find it a very interesting topic they would like to learn more about, or that they feel knowledge in the area, simplifying the task to be done. See Table 6.1.

Awareness promotion

The participants were asked if they think they will be more conscious about privacy as part of a questionnaire following the Kahooth! before the workshop(Figure 6.6), and in a survey after the workshop(Figure 6.7).

Of the 17 that did not answer that they thought they would be more conscious about privacy in the future 10 changed their answers from no, I don't know, or blank to yes. 1 of the participants changed answer from yes to no.

Of the 8 that still is not going to be more conscious of privacy 6 state that they already are aware while 2 said they will continue as before or that they are not worried. The participants changing answer from yes to know stated that they are already aware of privacy.

Nr	Reality	Play	Technology	Game concept	Score
1	Social Media (Business)	Strategy	Augmented Reality	The player explores the real world, and using his phone with AR he can hack the information of virtual companies. To excel, this information can be traded for money and other goods.	31,7
2	Social Media (Private)	Shooter	Virtual Reality	Your job is to explore the world and detect fake profiles on Tinder. By using a shotgun you exterminate the fake users one by one.	34,0
3	Social Media (Private)	RPG + Adventure[1]	Technology	In a VR world the player takes pictures of objects and post them to social media. This can give the player fame, or have grave consequences if wrong picture is posted.	35,3
4	Smart Cities (Business)	Survival Horror	Survival Horror	The player must survive in a smart city using stealth to not be detected by the government or hacked.	28,3
5	App Permissions (Private)	Survival Horror	Computer	A puzzle game where the player give permission to all his personal information. If he doesn't finish the puzzle everything is posted to social media.	30,0
6	Smart Cities (Private)	Adventure, Survival Horror[1]	Console	"Revolution" is a game where the state has gathered a lot of personal data about the player in a post apocalyptic setting, and the player must prevent them from abusing it.	36,7
7	Health Devices (Private)	Platform	Computer	Open world game, player is prompted about sharing private information. Can interact with other people to learn from their mistakes.	36,3
8	Social media + Mobile App Permissions[1]	Adventure	Adventure	The player discovers that an SNS uses private information illegally, and must decide what to do in a decision based game.	39,0
9	Smart Cities (Private)	Action	Computer	First person stealth game, where the player attempts to infiltrate and take down an "evil" organization that abuses personal data without giving away data about oneself.	37,0

Table 6.1: Table showing what cards the different groups selected/drew, the game concepts they ended up with and the total score of the game evaluation represented in figure 6.5

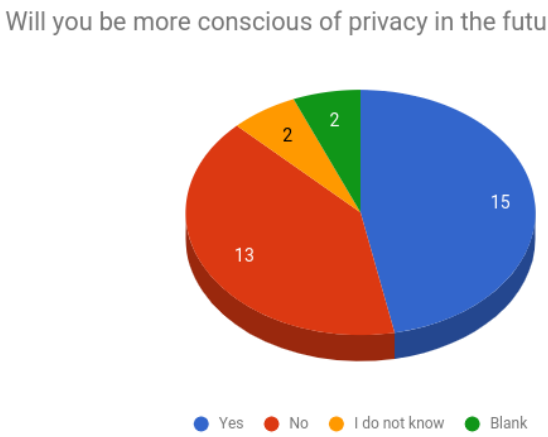

Figure 6.6: the results of the question “Do you think you will be more conscious of privacy in the future”(translated) asked after Kahoot! and before the workshop.

6.1.5 Discussion

The Privacy Game Co-Design Workshop proved to be an effective and successful process to support the co-design of serious games for privacy awareness. The results show that by utilizing the workshop, in a very limited amount of time, the participants were able to:

1. Specify a privacy-related scenario.
2. Give an existing game meaning.
3. Come up with a fun new game in a specific genre.
4. Reflect and combine the elements into one (successful) serious game for privacy awareness.

This shows that workshop is a tool to facilitate idea generation and creativity. In the following sections we will investigate strengths and weaknesses of the tool, identify the role of the workshop facilitators, explore how the Privacy Game Co-Design Workshop can be used in and by itself as a tool to raise privacy awareness, and how to follow up the game ideas.

Strengths of the Tool

The workshop is very flexible and can be customized to consider a specified domain by adding and removing cards. For instance if a particular game technology is desired, all other technology cards can be excluded. If the desire is not to raise awareness, but i.e to

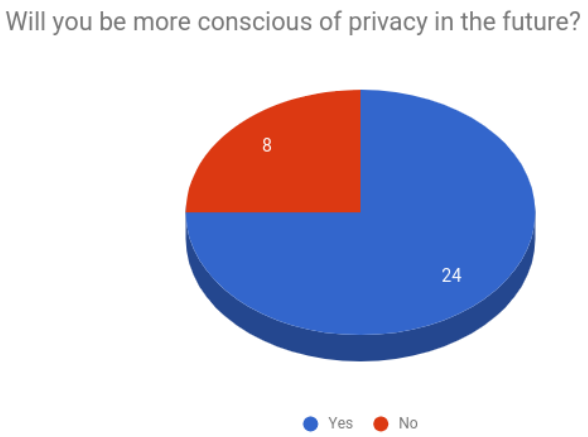

Figure 6.7: the results of the question “Do you think you will be more conscious of privacy in the future”(translated) asked after the workshop

increase motor skills, the meaning card can be replaced with one making sense in that context.

Having a structured process promotes creative ideas. As the results show, the participants found the difficulty level to be intermediate, being not too easy nor difficult which is desirable. In the pilot tests we experimented with letting the participants choose all their cards, as opposed to draw them, but feedback showed that this only lead to confusion. The participants were often excited to include different cards that did not seem to fit together, i.e Social Media, Virtual Reality and Role Playing Games. The resulting game idea was often very innovative and successful. That creativity permeate the entire process is also visible in the results since 7 out of the 9 final game ideas received high scores on innovation.

Based on the feedback the participants had enough time(Figure TIME). The exception were a group that quarreled. Allowing the participants to work for about 20 minutes and reminding them a few minutes before they had to pitch seems like a good time to get focused work. Only one participant reported that they had more than enough time. We are happy with this at the participants did not end up waiting for the other groups to finish or get too little time to feel that they finished the different tasks. We think this is reflected in the feedback of the different activities (Figure 6.3).

Limitations of the Tool

Observations and feedback from the user studies revealed that the participants did not use the board as much as intended, often forgetting about the guidance questions meant to help their creative process. Despite this, all participants came up with valu-

able ideas, and the authors were impressed with the way they were able to implement unfamiliar privacy challenges into valid serious games.

For the workshop to be effective the participants need an introduction to the field of privacy before starting the actual workshop itself. In the executions of the workshop, a quick intro presentation including a video was given to the participants in order to make them familiar with the main concepts of privacy as well as the privacy cards. Several participants commented on the presentation afterwards in the group interview, saying it was necessary to be introduced to the cards, as only reading them in English might not give enough information.

As with all creative processes ran in groups there is a possibility that one leader will end up controlling the group, limiting the creativity of the other participants. During the workshop executions this wasn't a problem, and all groups seemed to have a good dynamic and creative environments. Measures can be made to counter this problem, like making the contribution turn-based, but haven't been introduced because the authors believe this will limit the creativity of the group. Instead the coordinators can encourage to free dialogue among the participants, to avoid having one leader suppressing potentially good ideas.

The Role of the Facilitators

During the workshop, the workshop facilitators play an important role. Their job is to facilitate the process, and make it easier for the participants to go through the parts and steps of the workshop. Therefore it is important that they already have a good understanding of the workshop-process as well as knowledge on the field of privacy.

It is crucial to explain each part to the participants before beginning. To the facilitator it may seem obvious what the participants are going to do, but not necessarily to the participant. The instructions are readily available on the board, but as the results show, they aren't always read or utilized.

The facilitators can go to the groups and ask questions during their discussion. It is easy for the participants to g̈et stuckön a certain way of thinking, and can benefit from having some critical questions to their ideas. The same is true during the pitching - to truly understand the ideas, the facilitators can ask the participants questions regarding their idea to make them explain further or consider new and interesting aspects.

The notes of the participants can often be a good way to collect data. Other times not so much. If the facilitators have the time and capacity they should take notes of the ideas of the participants as they often can forget to write them down, and don't utilize the board to its full potential.

Using the Workshop to raise privacy awareness

Out of the 9 participants who piloted the the workshop, 7 reported that their awareness was raised from running the workshop. This may suggest that running a co-design workshop itself is a way to raise privacy awareness, and it was further strengthened in the final workshop evaluation where 75% stated that they would be more aware of privacy in the time to come. However, considering that prior to the actual workshop, the participants received a short presentation on privacy risks and played the Kahoot! game, it is difficult to claim that the workshop alone raised the awareness of the participants. Further investigating the possibility of raising awareness about a topic by running the workshop is something that could prove valuable.

Follow up of the Workshop: Possible Scenarios of Use

Several of the games designed by the participants are valid serious games that could be efficient tools to raise privacy awareness. A challenge with advancing the ideas to game development is that they are often very complex as well as costly and difficult to realize. Asking the participants to only create simple games is very likely to hinder their creative process and affect their final designs. It is also important to note that the facilitators of the workshop are not necessarily looking for final games, but rather ideas from throughout the process that can be combined or used as inspiration for creation of a serious game.

As the results show, the most popular reality card is “Social Media”. What to share and (more importantly) not to share on social media is a very important topic today. However, whether the popularity of the privacy problems in social media is because the participants consider it relevant and interesting, or rather because it is a familiar topic which is easy to discuss is hard to say. The choice of reality card can to some extent be reflected in figure (xxx bruk av digitale tjenester), where we can see that the adoption of facebook (social media) is very high, while the use of endomondo and other activity trackers are close to non-existent.

A recurring theme in the games from the workshop is to raise awareness by having in-game actions result in consequences. This is applies both to negative actions, such as over-sharing of information, and positive actions, such as making good decisions. The participants seem to think this would be a good way to raise the awareness and change the attitude of the player. It is a very interesting approach and a fun way to learn about the pros and cons of one’s choices. A drawback of using consequences of all actions as a measure of teaching privacy awareness is that it requires a lot of resources in development to foresee and design all possible outcomes in the serious game.

6.1.6 Changes

The changes made to the workshop after the second run can be seen in table 6.2.

Change	Reason for change
Created questions cards	To make presentations easier and to make it easier to write down answers, the questions was moved from the board and onto the covers of the workshop.

Table 6.2: Changes to the workshop after the first run

6.2 UNI2

The second run of the workshop was done with university students taking a course where they developed a cooperative serious game to raise awareness of privacy. The workshop became a idea generation activity for these students. The game ideas they developed has been followed by attendance at two presentations where the students first presented their current ideas and got some feedback, and in a final presentation showing a demo of the game designed. In between these presentations a focus group were held to get more feedback from the workshop and how it had affected their game idea.

6.2.1 Purpose

The purpose of this run was to get more experience with running the workshop, trying the workshop on an older audience, help kick start students in a class that would spend the next months creating a serious privacy game, and to try out a new layout of the board.

6.2.2 Participants

The participants were students from a university course. The goal of the course was to create a serious privacy cooperation game. Some of the groups in the workshop were the groups that worked together in the class, the rest were groups of random team members. The workshop were held in a large room where the workshop was in one half of the area with other students in the other part. The layout were not ideal, there were no place everyone could see and because of the size and that the room was shared it

was hard to give instructions to everyone at once. The class had limited time so introduction to privacy were done a bit before the workshop in the class lecture and the warm-up activity was skipped.

6.2.3 Data Collection

Data collection was done as before with a questioner before and one after the workshop. The feedback questioner after the workshop was extended to ask more detailed questions were the participants rated how fun, how challenging, and their own skills in each of the workshop parts. Text answer questions to get feedback to the workshop artifacts were also added.

6.2.4 Results

Demographic

The most used digital services used by the participants are social media, instant messaging, and streaming services as shown in figure 6.8.

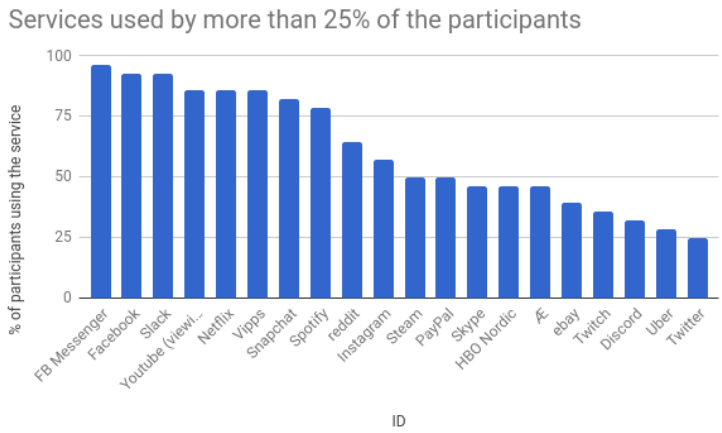

Figure 6.8: Services used by more than 25% of the participants

The participants answered the statement "I know enough about privacy" from strongly disagree to strongly agree. The results can be seen in figure 6.9. The participants were felt they knew some but on average not enough.

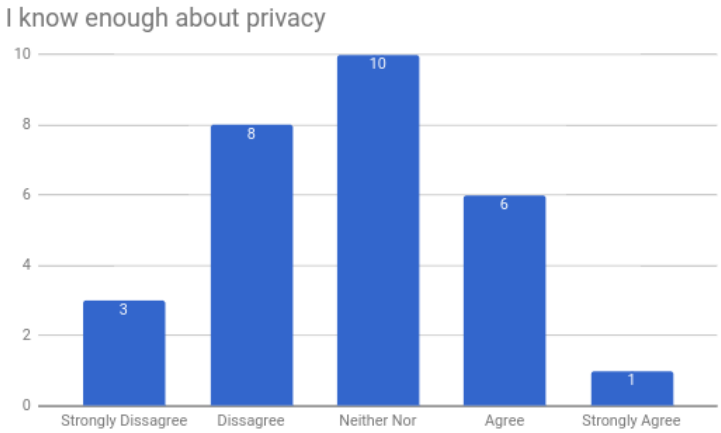

Figure 6.9: Responses to the question "I know enough about privacy".

Overall Experience

The participants reported difficulty of each of the workshops parts. Reality was commonly reported to be easy, Meaning was reported to be in the middle ground while Play and Technology were reported as challenging as shown in figure 6.10

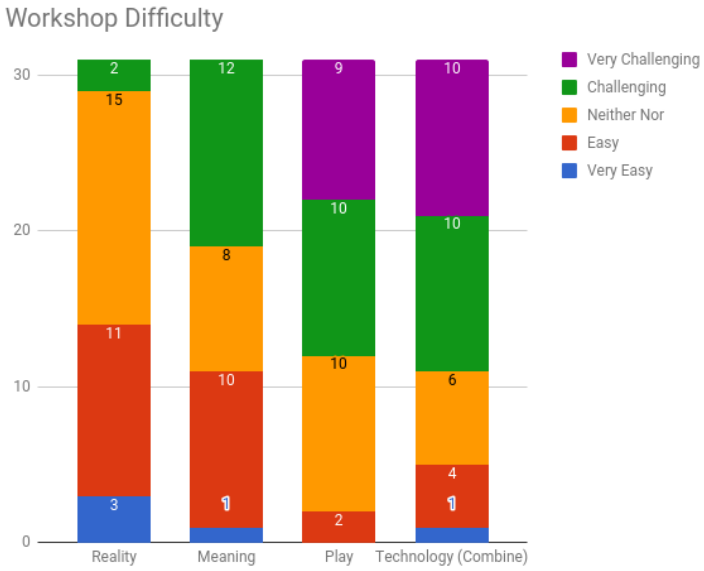

Figure 6.10: Self reported difficulty of the different workshop parts

In addition to how challenging each part of the workshop was the participants also rated how fun they found each part. The results can be seen in figure 6.11. The ratings are positive from a average of 3.5-4 out of 5.

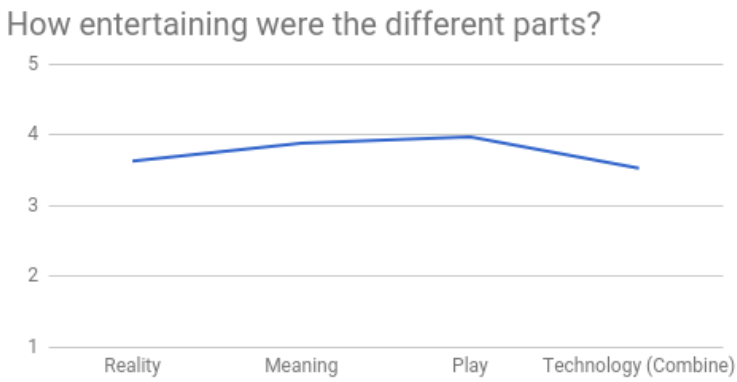

Figure 6.11: Answer to the statement "I found part x fun" for the different parts of the workshop.

Evaluation of game ideas

Two types of evaluation of game ideas were run, a evaluation by the master students involved in the workshop and a self evaluation done by the participants.

Self evaluation

Self evaluation was done by having the participants rate their game on a 1-5 scale along 6 axis in a radar chart. That chart can be seen in Figure 6.12. 14 of 30 participants did not rate one or two of the axis. one of the participants did not answer any of the axis. The axis were how good of a privacy scenario the group came up with, how well it raised awareness, how entertaining the game would be, how creative the idea was, their own overall impression of the idea and how easy they thought the game would be to develop.

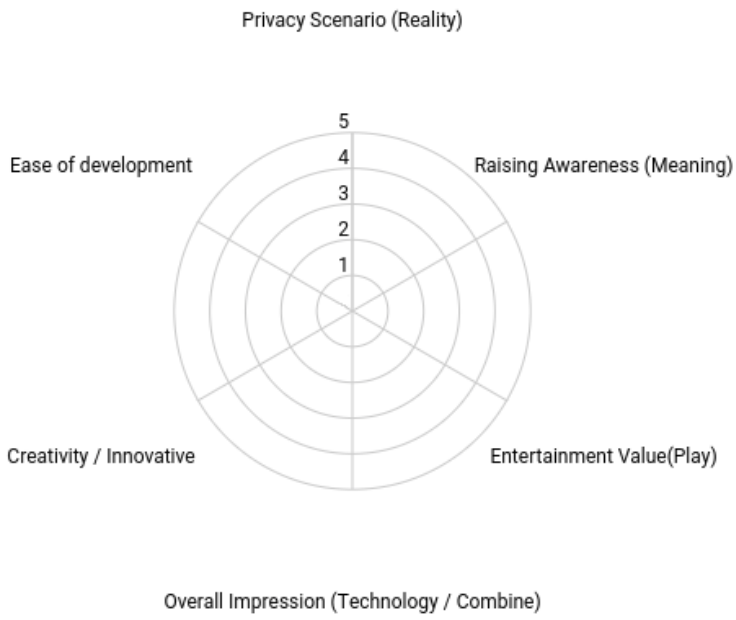

Figure 6.12: Radar graph were the participants rated their games in 6 axis.

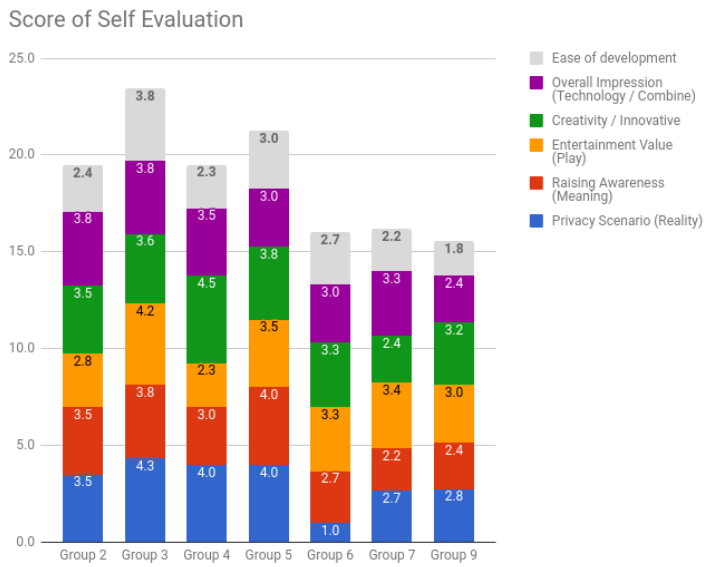

Figure 6.13: Graph showing the average scores for each group in the self evaluation they did.

Evaluation

The groups ideas was rated by the three master students creating the workshop in the same way as the earlier game ideas was evaluated. Each of the master students gave each game a score according to six axis before the average was calculated.

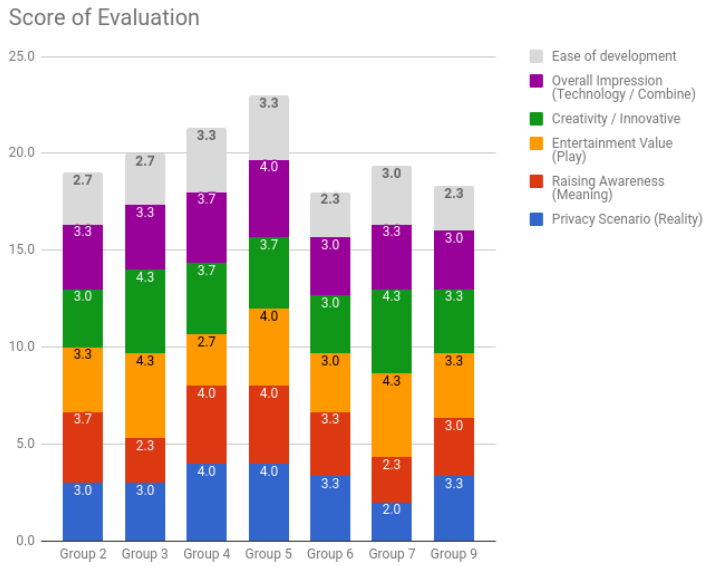

Figure 6.14: Graph showing the average scores for each group in the evaluation preformed by the 3 master students behind the workshop.

Cards chosen

During the workshop the groups selected three cards as well as some options within these cards. One of this options were whether the problem was related to a private person or a business. Most of the groups selected private person while the remaining did not mark their selection. The cards chosen can be seen in table 6.3 along with a short description of the game idea.

Nr	Reality	Play	Technology	Game concept	Score

2	Smart cities	Geo Location	Interactive Surfaces	This is a mobile game based on the sims. Looking at smart city. You have to walk to places in the real world to buy things for your sims game. What you buy affects the environment. Have to go to stores in real life to by things. Ads for places you have been in real life in the game. Real life sims + smart city. Interactive surfaces functions as stores.	19.0
3	Activity Trackers	Survival Horror	Mobile	In Escape campus the mobile game, the player has a target player he is trying to catch. Sensors on campus report were the player you try to catch is. You can place traps to catch the player.	20.0
4	Mobile app permissions / Social Media	Survival Horror	Mobile	Mobile game that has access to everything on you phone. It listens and figures out what you do. If you things that is bad for the environment it will post messages on your facebook about it.	21.3
5	Activity Trackers	Pet-raising sim	Mobile	This is a mobile game were the player gives up some personal information in the beginning of the game and are then matched with 5 other people. In the game you chat with these people. You trade your information with others and try to get all information about one person.	23.0

6	Smart Cities	Geo Location	Mobile	This is a mobile geolocation game where you play the game and have to walk around to buildings to get tips. I think the idea is that it is a sort of real world treasure hunt. You goes around the city. Everyone knows where you are. Go to museums and government buildings. The topic is smart city and that you have no control over the information that is shared by a smart city. When you walk around the city can share information about you and make it publicly available. So while you play the game your location is public and you get to feel a bit on that.	18.0
7	Location sharing	Geo Location	Mobile	Mobile - real world Car race. Mobile app. You put money in a pot. The first to get to a place gets all the money. The app listens and figures out if you break any traffic rules. If you break any rules, traffic etc then you will not receive the money. Your location is shared during the race so everyone know where you are.	19.3
9	Health Devices	Rhythm game	Virtual Reality	You are a warlord in africa. You have health devices on child soldiers. Sending them to fight against other warlords. The health devises gives information about physical as well as mental health. You use this information to make your army as effective as possible. The game is played in VR and shows how much data it is possible to collect about a person.	18.3

Table 6.3: Table showing what cards the different groups selected/drew, the game concepts they ended up with and the total score of the game evaluation represented in figure

Awareness promotion

16 out of the 31 participants reported that they learned something from the workshop. 10 out of the 31 participants reported that they would note be more aware of privacy in the future. The main reason given for not being more aware of privacy in the future was that they were already aware of privacy.Other reasons give were that the benefit outweighed the cost or that they simply did not care.

Workshop Feedback

The participants were asked to give feedback on the the workshop artifacts as well as to the process. 21 out of 31 student reported that the workshop did not affect their creativity or helped them be creative. The workshop board was rated at an average of 4.3 out of 5 in how easy it was to use, the workshop cards 4.3 out of 5, and the instructions 3.9 out of 5.

6.2.5 Discussion

The participants answers when rating the workshop difficulty was more varied than in the first run 6.2.4. This is probably because they rated each part of the workshop instead the workshop as a whole as previously done. Most of the groups found the Play part challenging, this indicates that changes can be made there to improve the workshop. Challenge is not necessary negative, but when trying to reduce time consumption it should be considered.

Self evaluation

Using a radar diagram as input of self evaluation did not work out well. Our assumptions were that the participants were familiar with graphs of this type and would find it interesting to fill this out instead of adding another section of boring radio buttons. This did not work out and the resulting data is poor with some values having only a single response counting for the whole group. Possible improvement to using such a diagram

[1] Did redraw and kept both

as input method could be to show an example, or number each of the axis. Using the standard radio buttons is preferred, they are standard for a reason and we got to relearn that once again by trying to be clever.

6.3 Expert feedback

6.3.1 Purpose

The purpose of getting feedback from an expert was to gain ideas as well as to get validations on ways to improve the workshop.

6.3.2 Participants

The expert was a student with experience with workshops trough participation and trough hes work as a teaching assistant in courses that has workshops as an teaching activity.

6.3.3 Data Collection

The original workshop and setting was presented with all the workshop artifacts. After the presentation high level ideas were discussed and notes taken. After the high level details were discussed, suggestions for rephrasing of instructions on the board and other workshop artifact were written directly on the artifact as well as on post-it notes placed on the artifacts.

6.3.4 Results

The expert gave lots of small feedback to the text of the board and the instructions. In addition he gave some more general comments about the workshop:

- 2 hours is little time for a workshop.
- The play part works against the rest of the workshop as it is easy to lose track of the privacy parts there because of new random elements that has to take into account. Creating a game based on the game they modified in the Meaning makes more sense.
- Adding drawing to the Play part where they draw a storyboard makes sense. Can introduce story board as "comic strip" to avoid using terms the students don't know.
- The warm-up activity could be done more physical and away from the phone.

6.4 Discussion

The average feedback from USS1 showed that the classes enjoyed the workshop and did not find it to difficult. The ideas generated also seemed to be of good quality. UNI2 also found the workshop fun, but also found play and technology more challenging. UNI2 was asked more detailed and not for the whole workshop so that might have affected the result.

The workshops artifact seems to work well except for writing on the workshop board. Some of the groups had some problems presenting as they could not bring it with them and it makes it harder to present. It seems to also make it a bit harder to write when it is hard to move what you write on. Moving away from writing on the board and creating separate pieces to write on could work well. Not writing on the boards would also make the board more reusable simplifying the process of holding a workshop.

What seemed to work well with the workshop artifacts were the board covers hiding the next parts. It seemed like it kept the groups focused and that they enjoyed opening the next parts.

As mentioned by the experienced workshop facilitator, there seems to be some struggle with the play part. Changing the process so that all groups have to build on the previous step could fix this and make the process simpler. It could also remove some of the creative aspect of the workshop.

Even tough the ideas generated by the groups were good, the focus on privacy issues could be even stronger. Giving some more material to the groups in some way would be interesting. It is kind of hard to do it as everything takes time and having the groups read something would take to focus away from the workshop and would take time. Asking for the groups to read it in preparation could be an option. Alternatively, some of the groups did use the Internet to find more information. This could work nicely, but is probably very dependent on the class.

None of the groups seemed to use the Reality card modifier, Business / Individual. The idea behind this modifier were not clear enough, not communicated well enough. This combined with that the situations described could involve both components and in general shows the answers warrants its removal.

Based on the ideas generated in the two workshop runs the workshop seems to work well for generating ideas. It does however seem like knowledge about privacy could better be conveyed. The workshop also takes longer time than ideal. Simplifying the workshop and focusing more on the privacy part by having to build on the previous steps can solve these challenges.

6.5 Changes

6.5.1 Process

Change	Reason for change
Each step builds on the preceding steps	To hold privacy more in focus, make the workshop more structured and to shorten the time needed further.
Set time limits for certain sub tasks	To avoid that the participants spend a lot of time discussing what topics or games to select. Trying to focus the time around discussing the privacy problem.

Table 6.4: Changes to the process from version 1 to version 2.

6.5.2 Board

Change	Reason for change
Change board instructions	To fit with the new process of building, to clarify some language.

Table 6.5: Changes to the board from version 1 to version 2.

6.5.3 Question cards

Change	Reason for change
Change card format to A5	To make it easier to print and cut for the facilitator
Add back to the cards	To make the distinction between the different types of cards clearer and make it feel more like a game.
Change questions on the cards	To help the players explain their ideas clearly to the other participants.

Table 6.6: Changes to the question cards from version 1 to version 2.

Chapter 7

Workshop version 2

7.1 Focus Group

7.1.1 Purpose

The focus group were held to get feedback from students that had attended the workshop and had continued working on a serious privacy game. Learning what they had taken with them, what they could have needed from the workshop, and what could have been changed now that the students had had some time to reflect on creating serious privacy games.

7.1.2 Participants

The focus group were held with 5 students from the course creating the serious privacy games. All participating students were male. The students were recruited after the presentation by asking each group for a voluntary participant. Three of the focus groups participants were in the same group in the workshop, but in different groups in the course. One female student volunteered, but could not attend at the planned time. A structured interview with the same content as the focus group were held with this student in stead to get some feedback from females as well.

7.1.3 Data Collection

The focus group and interview had two main parts, feedback of the workshop the students had participated in, and feedback on the changes done to the workshop.

Workshop Feedback

Data was collected by first having the participants write down their thought to the following questions:

- What did you take from the workshop into the game you have designed?
- What do you wish the workshop had given you? In terms of knowledge, idea generation, or something else?
- What would you have liked to have done differently in the workshop?
- If you could go back in time and tell your earlier self, something about privacy. What would that have been?

After the participants had spent about 15 minutes writing down answers to these questions, they were discussed in the group. The participants took turns sharing their thoughts and were asked follow up questions and got comments from the other participants. The participants wrote down their thoughts first in an attempt to avoid group thinking.

The questions were based on the three common questions asked in retrospectives in the development methodology SCRUM:

- What went well?
- What didn't go so well?
- What could we have done differently?

The thoughts shared, and the comments given were written down and the paper the participants wrote their toughs down on were collected.

Workshop Changes Feedback

Feedback to the changes to the workshop were collected by presenting the workshop the students had participated in before presenting the changed workshop. The participants were informed that the workshop normally contains a presentation and a warm-up activity that they did not have due to time constraints. The participants were also informed of the change of main goal of the workshop, from being a generative workshop, to being a informative workshop. The feedback were the written down as the participants shared their views.

7.1.4 Results

What did you take from the workshop into the game you have designed?

The participants thought the workshop was a good starting point for thinking about serious privacy games. The workshop made the participants more aware of what the participants wanted to learn more about and gave insight into the process of designing a serious game designed for privacy. They were in general happy with the brainstorming aspect of the workshop and felt it helped them get started. The participants wrote that they got some ideas for different privacy topics from the workshop. Another stated that he did not feel he got so much from the workshop except that it might have made how to make a game concept fit together. One participant wrote that the workshop gave him a wider range of possibilities and hearing the other groups ideas contributed to this. Two of the participants stated that they in some way continued the ideas they started in the workshop. By continuing with the game, or with the privacy problem.

What do you wish the workshop had given you? In terms of knowledge, idea generation, or something else?

The participants reported that it started abruptly. A smother introduction would have been nice. It was hard to combine all the parts and it came as a surprise that they would be combining the workshop parts to some of the participants. It is not obvious that privacy is a problem, and the privacy part of the workshop felt a bit forced. When investigating the statement that the privacy part felt a bit forced it became clear that it felt like the privacy part was hard to make into a fun game. When discussing it became clear that creating a game were the main focus is not fun but learning goes a bit against what one thinks of when creating a game. The workshop did not give the participants anything in regards of how to incorporate cooperation into a game. The same is the case for showing the students what are realistic ideas that can be implemented, and what concepts are easy to turn into a game. The participants wrote that they would have liked to learn, how to gamify privacy, examples of cooperation games, examples of serious games, examples of privacy incidents, and maybe a future focus on how a weaker privacy would affect us. Another participant wrote he would have like to have learned more about privacy during the workshop. Two of the participants wrote that they would have liked to have learned more about how to judge what is realistic to create during a semester in the course. One would have liked to have another session where they analyzed the game they made so they could look at what was good and bad in it so they got more out of the workshop than just the one idea.

What would you have liked to have done differently in the workshop?

The participants stated that they had to little time in the workshop. They would have liked another step where they could reflect over their ideas and see what they could take with them. They would like to get feedback from another group on their idea. They felt there was something missing to connect the parts, and that the workshop was not connected to the workshop. One of the participants felt that the flow was illogical. One wanted more discussion of the ideas and to cooperate with another group. To make the workshop more relevant for the course two students suggested to introduce cooperation technology in some way as well as give more examples as realistic ideas as brainstorming ideas can wild and hard to actually realize. Some of the tasks were also easy to misunderstand.

If you could go back in time and tell your earlier self, something about privacy. What would that have been?

The students reported that they would have told themselves to:

- be better at using good passwords.
- be more careful about location sharing, it is easy to get used to it.
- don't post stupid things on Facebook [it's "permanent"].
- there is a trade of between giving up privacy and receiving services.
- that it is nothing to worry about. There are other concerns, primarily related to money, that is of greater importance.
- the definition of privacy.
- examples of privacy scenarios.

Feedback on Workshop Changes

After presenting the workshop and the updated version the changes were discussed. One concern stated by one of the participants was that he was afraid that the workshop focused to much on writing things down and if it is important that it should be incorporated time into the workshop for this. Another participant felt that writing things down was no problem at all and stated that they had done it at every step. The participant arguing against writing down had the version of the workshop artifacts where they wrote directly on the board, and the participant arguing for writing things down had the loose question cards so they did not have to write things down on the board. The participants liked that you had to open each part. It made it feel more fun, like a game. The

group that wrote directly on the board stated that they forgot the instructions and did not follow them, they focused instead on the cards and the discussion. The participant writing on the question cards stated that they used the instructions and found them very helpful. The participants found the change of building on the last step to be a logical change. And thought it can make it easier to combine the game as it came as a bit of a surprise to some of the participating groups that they had to combine the tree previous parts into one game. The participants stated that the goal of the workshop mater as well when finding out if building on the last part or diverging for each part individually is the best approach. If the goal is to come up with new original ideas, then drawing cards and not building would be a good thing as one has to be creative. For an activity were the goal is the discussion of privacy, then building on the last part and not drawing as many cards is probably better as they get more time to think of the game in terms of privacy instead of trying to come up with creative ideas to make random elements fit. The focus group participants were a bit concerned of the motivation of a high school or secondary school student to participate in such a workshop. One participant talked about how to have the students participating in the workshop produce something that they could show for the work they had done.

7.2 LSS3

7.2.1 Purpose

The purpose of this workshop run was mainly to validate the changes to the workshop. It was also the first run with secondary students with the previous activity being with high school or higher education students.

7.2.2 Participants

The participants were students in 9th and 10th grade. There were 23 students in total with some students arriving delayed or during the workshop. The class consisted of 15 male, 2 female, 1 undisclosed and 5 unreported students. The class were a ICT specialization course. The classroom had a standard layout with a board with projector in the front and rows of pairs of desks. The teacher stayed during and was active during the workshop.

7.2.3 Data Collection

Data were collected in multiple ways, two surveys, one before and one after the workshop, a Kahooht! before the workshop, and in several ways during the workshop.

The surveys was as in the earlier runs first about the participants background and relation to privacy and games, and after the workshop, about the participants experience. The Kahooht! was mostly as a warm up activity but the answers were stored and analyzed to understand the participants understanding of privacy. The data collected during the workshop were text written down on question cards, drawings drawn on supplied pieces of paper, observations, photos of the usage of the workshop artifacts, notes of presentations. After the workshop feedback were also collected from the teacher and by the project supervisor who observed the workshop.

7.2.4 Result

Demographic

The students were asked multiple questions to understand their background and attitude to privacy. One statement the student were asked to rate from 1 - "Strongly Disagree" to 5 - "Strongly Agree" were "I know enough about privacy". The answers can be seen in Figure 7.1.

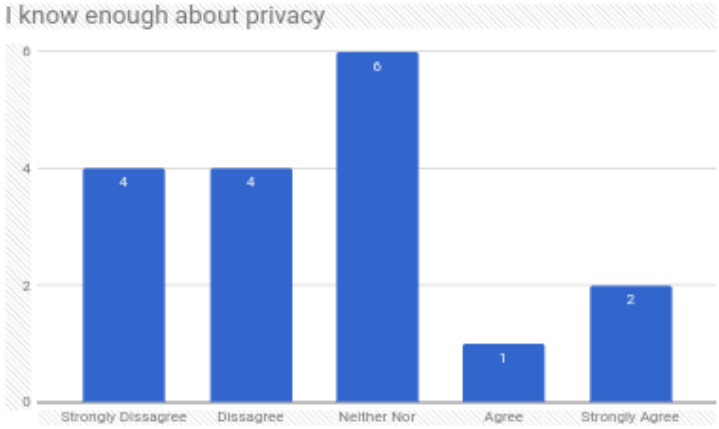

Figure 7.1: Answers given to the statement "I know enough about privacy".

Overall Experience

The students seemed to enjoy the workshop based on their answers rating how fun the thought each part of the workshop was as seen in Figure 7.2. The students rated the question "I found the Reality part of the workshop fun" with a value from 1-5 where 1 represented "Strongly Disagree" and 5 represented "Strongly Agree".

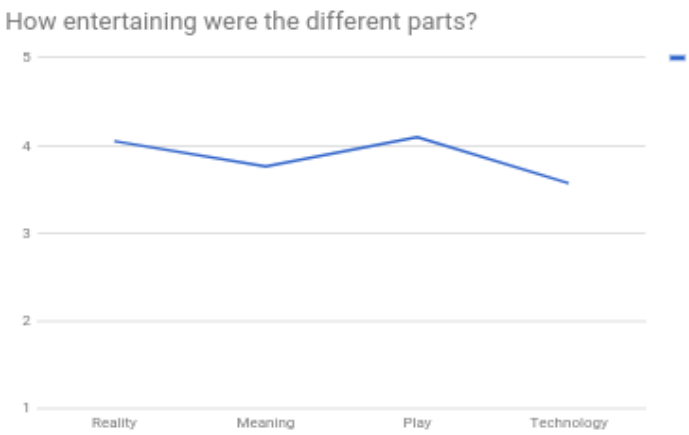

Figure 7.2: Average rating of the statement "I found part x fun".

The students were also asked to rate the statement "I found part x in the workshop to be challenging" with a value from 1 - "Strongly Disagree" to 5 - "Strongly Agree" for each of the four parts of the workshop. The answers are presented in Figure 7.3

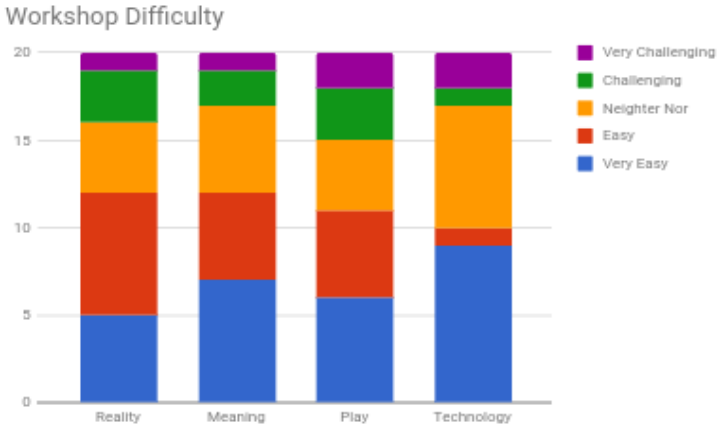

Figure 7.3: Answers to the statement "I found part x challenging"

Cards chosen

The groups had multiple choices to make during the workshop. What reality problem to pursue, what game genre to create a game in, and what technology to create the game for. The groups decisions along a description of the games can be seen in table 7.1.

Nr	Reality	Play	Technology	Game concept
1	Medical journal / data breach	Racing	Online Computer	4 player racing game inspired by Mario cart. The last player to finish gets his IP-address added to a list of losers. To remove your ip address from the list you have to play again and win.
2	Location sharing	GPS location	Interactive devices	Avoid players playing as criminals by keeping track of them on your mobile phone.
4	Mobile app permissions	First Person Shooter	Virtual Reality	lasertag. When you die have to give up background information about yourself
5	Smart Cities	First Person Shooter	Console	1 vs 1 fps. First to 3 kills. Raises awareness about sharing payment information.
6	Mobile app permissions	Action / Adventure / Strategy	mobile / computer / Console	Inspired by clash of clans, but when you buy gems you get a warning that your payment information might be leaked when you buy.
7	Mobile app permissions		Computer, Console, Mobile	Inspired by Fortnite PVE. The players have to defend a giant USB stick with important personal information against an army of Zuckerberg.

Table 7.1: Table showing what cards the different groups selected/drew, the game concepts they ended up with.

Observations

Group 1 had a student that seemed to have misunderstood the task and controlled the rest of the group to some extent with her strong personality.

Group 2 seemed to work well. The group had 4 students and at least 2 of them worked. The group were done with all tasks early.

Group 3 worked against the facilitator and did not answer the workshop and parts of the surveys in a fulfilling way.

Group 4 had two students that worked and one that spent much of the time talking

to group 5.

Two of the students in group 5 were distracted with their phones or other students much of the time during the workshop.

One the the students in group 6 did not participate in the activities.

Group 7 arrived after the Kahooth! so they did not partake in the initial survey or the Kahooth!

The teacher started the class and introduced the activity shortly giving the students context. During the workshop he walked around and kept the students quiet. He also listened to the students ideas and tried to motivate them and give them some ideas, or help them build on their own ideas. Due to the number of groups and the time limit of each part, the teacher did get in the way of talking with groups on a few occasions.

At one point the teacher talked with one of the groups about issues related to online payments. When presenting next the groups close by the group that talked to the teacher about payment issues had changed their idea to involve payment issues. The groups reality problems of the four groups involved in the incident was group 3 with copying keys, group 4 with mobile apps requesting personal information, group 5 with smart cities and online payments, and group 6 with mobile app permissions and loss of control. After the incident the problems were group 3 with storage of payment information, group 4 with awareness about payment in games, group 5 with pay to win, and group 6 with awareness about payment in games. The group 3 started presenting something else before changing mind and going for storage of payment information. The ideas were presented in reverse order the second time so that group 3 came after the other groups talking about online payment.

There seemed to be few problems with doing choices and knowing what to do in this run. It was planed to impose time limits for doing choices but the groups managed to take decisions before the planed time limits. The groups also seemed to understand what they were supposed do from the oral instructions as well as the instructions given on the board. When talking with the groups they were mostly working without problems.

The groups wrote down their choices early, but some of the groups had to be reminded to write down the rest of their ideas.

Feedback from teacher and supervisor

- It is hard to instruct secondary school students. Having a teacher that specializes on a specific age is better than having teachers that follows the classes.
- Instructions have to be very clear.
- The students should be given a goal to work against and have some way to see their progress towards this goal. The school operates with that the teacher writes

the goal of the session on the board.

- "Everyone" expects the group work just works. The students are not teached how to work in groups so what ends up happening is that one of the students ends up doing all the work.
- To solve that only one student works. The students could be made responsible for different parts. Or the workshop could in some other way facilitate that the responsibility is shared so that the work is shared.
- The teacher know the class, the students and the culture in the class. The students also knows him, his boundaries and expectation. This makes having the the teacher present in such activities as the workshop important to control the class and make sure that all the students actually are following.

7.2.5 Changes

The following changes were done to the workshop to make it shorter.

Change	Reason for change
Remove Kahooth!	To reduce time and to focus more on the presentation to make the privacy part stronger.
Remove presentation after Privacy and Play	To reduce time.

Table 7.2: Changes to the workshop

7.3 LSS4

7.3.1 Purpose

The purpose of this workshop run were mainly to validate the changes to the workshop from version 1. This version also removed two of the presentations and the Kahooth! in the beginning to save time. The group sizes were changed to 2-3 students instead of 3-4 students.

7.3.2 Participants

The participants in this run were 8 graders in an ICT specialization class. The class had 24 students in total with 18 male, 4 female, and 2 undisclosed students. The classroom

had a standard layout with rows of pairs of desks and a projector on the board in the front. The teacher stayed during the workshop. The teacher were a teacher student doing practice and had been with the class for several weeks. She were present during parts of the discussion after the previous workshop.

7.3.3 Data Collection

Data were collected by a survey before and after the workshop as well as with text and drawings done during the workshop, photos of how the students interacted with the workshops artifacts and by observations. There were no time for presentations in this run.

7.3.4 Result

Demographic

The students rated the statement "I know enough about privacy" from 1 - "Strongly Disagree" to 5 - "Strongly Agree". This group of student felt they knew more than the students in the last run with the majority saying "Neither Nor" or "Agree" compared to "Strongly Disagree", "Disagree", and "Neither nor" as seen i Figure 7.4

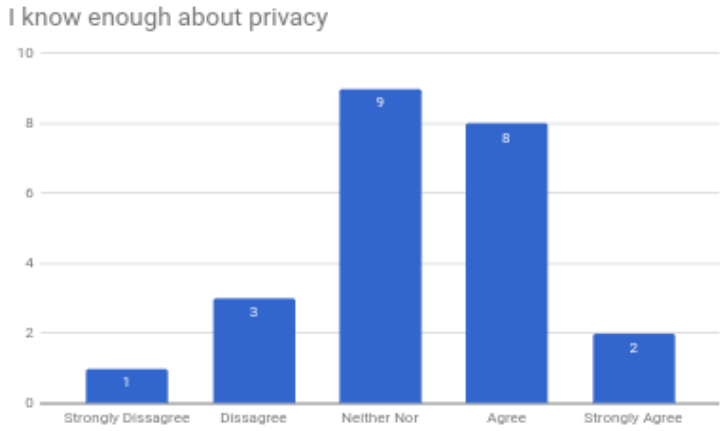

Figure 7.4: Answers to the statement "I know enough about privacy".

Overall Experience

The students were asked to rate the same statement as in the last run rating "I found part x of the workshop fun" from 1 - "Strongly Dissagree" to 5 - "Strongly Agree". The

result shows that the students this time found the workshop less fun that in the last run. Going from an average of 4 - "Agree" to 3 - "Neither Nor" as seen in Figure 7.5

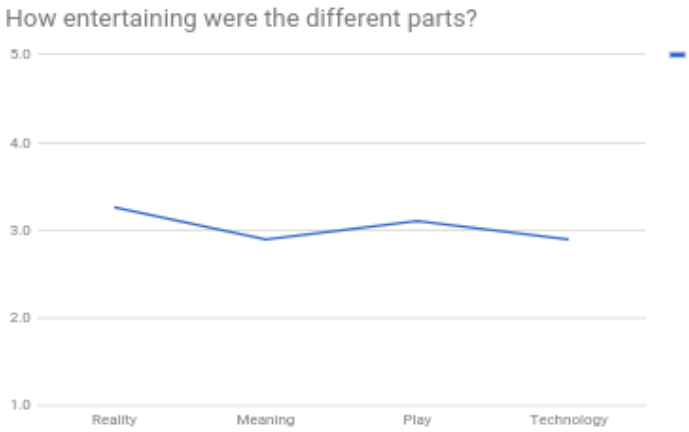

Figure 7.5: Answers to the statement "I found part x fun".

The students found the workshop more challenging than the last run, but not difficult as seen in Figure 7.6

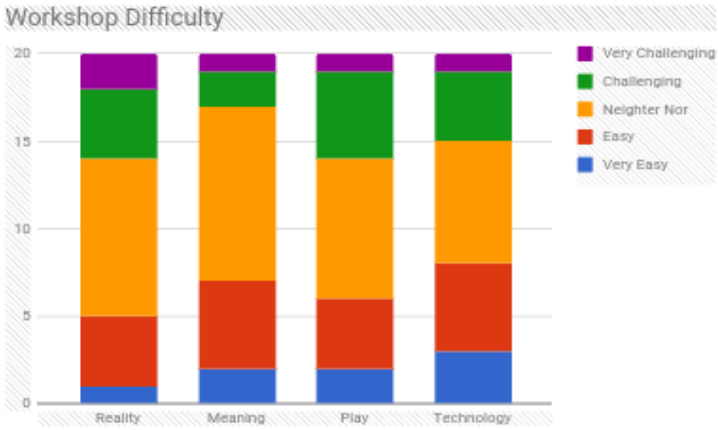

Figure 7.6: Answers to the statement "I found part x challenging"

Cards chosen

Nr	Reality	Play	Technology	Game concept

1	Facebook is listening	Horror	Virtual Reality	Inspired by Fortnite save the world. You have to protect something from a zombie invasion, but insted of zombies there are terms of service. Have to hit "decline" and not "accept" on the mobs attacking.
2	Location Sharing		Mobile	"The American Dream" is a game where the goal is to fatten the player the most while avoiding location based adds for health studios.
3	Social Media / Data Breach	First Person Shooter	Technology	
4	Social Media	Drama	Mobile	You help a girl delete nudes.
5	Hacking	Action	Computer	inspired by TGA. The goal is to hack the president
6	Mobile Data Usage	Rescue	Computer	The player has to save a friend. If he touches coins he will lose
7	Location sharing / smart watches	GPS Location	Computer	Based on Pokemon Go, but with better security.
8	Mobile App Permissions	Parkour	Technology	Players downloads apps that sells their informations to a hitman that kills them.
9	Social Media	Arcade	Interactive screens	The goal of the game is to collect good terms of services without accepting bad ones. Terms of services fall from above and the players has to collect them buy dragging a box under the term before it hits the ground without catching the bad ones.

Table 7.3: Table showing what cards the different groups selected/drew, the game concepts they ended up with.

Observations

This workshop only lasted for 1 hour and 35 minutes due to the class starting at 10 past and ending at 45. This was unknown at the start time of the workshop and resulted in time being cut from some of the part as well as the presentations being cut.

This workshop was held in the morning as the students first activity. They had a lot of energy and were hard to keep quite for the instructions. It took 10 minutes just to sort the students into groups before starting.

Group 3 had one student that did not partake in the activities and the other two students worked against each other. Had to give them a new question card for the play part as one student did it without the other students consent.

Group 4 were testing the facilitators limits, argued, and used a lot of time taking decisions.

Group 8 had one quiet student that wrote down everything. The other two members of the group spent a lot of time talking to group 7.

Group 9 came late, started after the other groups and kept going to group 3. Some students from other classes came in and disturbed some of the groups on a few occasions.

3 students did not answer the feedback survey and 2 students did not fill out all of the parts of the survey.

It was difficult to control the class. The teacher student, but it was still harder to get the attention from the students.

Feedback from teacher

The students seemed to enjoy the drawing part. Some of the students got more interested when they were told they would draw something.

Keeping the focus of the class is hard and telling the students to do something before you are done explaining what you are going to do will make them stop listening to you. This was done when they were asked to open the next part while the instructions were given.

It is hard to get the attention and control a class. This was a noticeable problem in the beginning but it got better.

One of the groups were testing were testing your limits.

After the previous workshop there was talk of giving the students responsibilities during the workshop. It might have been just as well not to introduce it, as 8th graders are probably a bit young to be given responsibilities.

7.3.5 Changes

The following changes was done before the next workshop:

Change	Reason for change
Translated presentation to English	Next class was an international class so the presentation had to be in English
Updated the presentation	To show where in the process, what the current goal was and what remained of the workshop.
Added news articles to presentation	To give more depth when talking about the different privacy topics that is discussed in the workshop.

Table 7.4: Changes to the workshop

7.4 LSS5

7.4.1 Purpose

The purpose of this workshop run were mainly to validate changes from the workshop from version 1. This run also had a updated and translated version of the presentation as the class were English speaking and news articles for each privacy card were added to give the students more understanding of privacy.

7.4.2 Participants

The participants in this run were 8 graders. The class had 16 female and 7 male students with 23 students in total. The classroom had a standard layout with rows of pairs of desks and a projector on the board in the front. The projector had low contrast with the lights on. The teacher stayed during the workshop and knew the class well.

7.4.3 Data Collection

Data was collected by a written survey before and after the workshop, by observation during the workshop, by audio recording of the presentations during the workshop, by talking with the teacher after the workshop and by observation done by the project supervisor.

7.4.4 Results

Demographic

The students rated the statement "I know enough about privacy" from 1 - "Strongly Disagree" to 5 - "Strongly Agree". This group of student felt they knew more than the

students in the last two runs with the majority saying "Agree" or "Strongly Agree" as seen i Figure 7.7

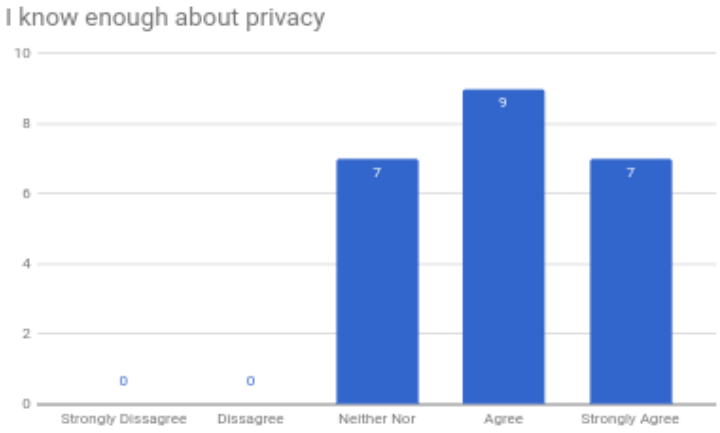

Figure 7.7: Answers to the statement "I know enough about privacy".

Overall Experience

The students found the workshop about as fun as the last class rating the statement "I found part x of the wroskhop fun" to "Neither nor" as shown in Figure 7.8

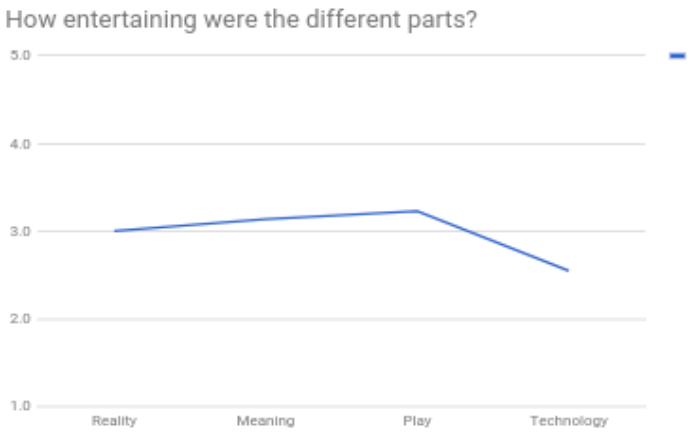

Figure 7.8: Answers to the statement "I found part x of the workshop to fun".

The class found the workshop difficult to be about as challenging as the last class with "Neither nor" as the most common answer as seen in Figure 7.9

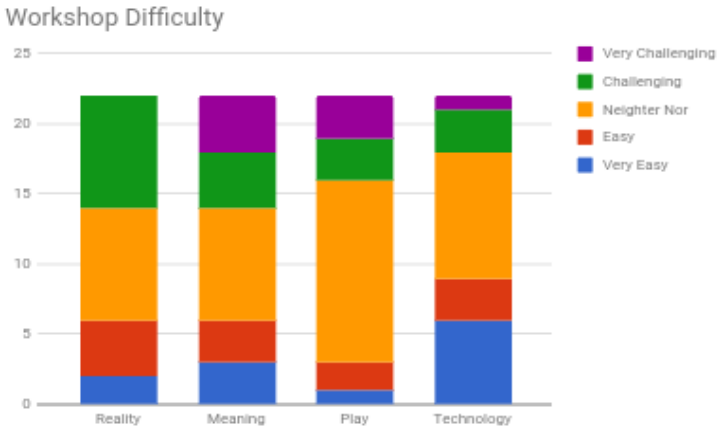

Figure 7.9: Answers to the statement "I found part x difficult".

Cards chosen

Nr	Reality	Play	Technology	Game concept
1	Tracking by adds		Virtual Reality	Hackers and Defenders. Defenders try to counter hackers attempt to hack other people.
2	Smart Cities	Point and Click Adventure	Augmented Reality	The player clicks on objects and get to see the risk of using it. Can use it with mobile and you just scans objects and risks connected to that item is listed.
3	Activity Trackers	Mystery	Mobile	You are tracking other people. You have 20 minutes to find a person by tracking online activity, mobile phone, cc-tv cameras and more. To hack the systems to track the person you have to play mini-games. At the end of the 20 minutes you have to make a report to your boss of the persons location. You get multiple answers quiz to answer.

4	Location Sharing	Exploration / Action / Horror	VR on Console	Level based game. You have to solve puzzles. You have to use Social Media, but you have to use it wisely to get to the next level. If you use it to much people will try to get you. They will find you from your location data.
5	Social Media	Point and Click Adventure	Mobile	You try to sign op to a service and have to enter a lot of information. If you are careless and just accepts everything then there are consequences like getting hacked. Being careful is the way to win.
6	Mobile App Permissions	Mystery	Mobile	A girl takes a photo and sends it to a friend, but then regrets it. Your goal is to go trough this girls phone to figure out who she sent pictures to and delete them before the person receiving the photos has time to upload them.
7	Social Media	Drawing Game	Computer	Computer game where one person draws and then the other players share the image between them. Then the drawer tries to delete all the copies of the drawing before a timer runs out.
8	Social Media	Play	Technology	Inspired by red light. One person has a key behind him and his back turned at all times. The rest of the players try to get hold of the key. If they move to fats a device detects it and makes a noise and the game resets. When the players get the key. The person who started with the key have to guess what person has taken the key. - 2 or more players. 1 player takes the mystery cap. Tries protect his mystery cap.

Table 7.5: Table showing what cards the different groups selected/drew, the game concepts they ended up with.

Observations

The class were easier to work with than the previous classes. Quieter, did as asked and asked questions they were unsure. The time plan created for the workshop were skewed 30 minutes and had to be reworked. There was also a misunderstanding of how much time was available because of this. This demanded some attention from the facilitator in the beginning to correct. The teacher knew the class well and grouped the students so they worked well. In the previous runs the students had mostly grouped themselves. The teacher helped get the attention from the students and asked questions to clarify the goals of the different tasks. Due to the low contrast of the projector it was mostly used for displaying the videos. To show the parts a example of the poster resulting from the workshop were used instead. The videos selected were at some points a bit to technical and political than ideal. The videos used previously had some elements of fun and managed to keep the students attention a bit better. The teacher asked questions to clarify the goals and when one group had a question the answer were relayed publicly to all the other groups. The class talked with each other and seemed interested. They made some noise but at a much lower level than the previous two runs. Even tough they were quieter it was still hard to grasp their attention. Even tough the class were easier to work with presentation still took time. The students were slow to come to the front as they were a bit vary of presenting. And when they came to present some of the groups ended up reading everything they had written.

Group 2 wrote down "Augmented Reality" as their technology but presented the ideas a both "Augmented Reality" and a "Computer" game.

Group 8 ended up with two ideas.

Not all the groups filled out the game genre on the play question cards, and some wrote down genres that badly described their games.

Two of the groups created analog games that did not really require technology. It was however possible to add technology in a meaningful way such as an App that displays random questions instead of using a deck of question cards.

The workshop lasted for 2 hours and 15 minutes including surveys.

What the students should do in the meaning part is a bit unclear. One of the groups misunderstood how they should modify existing games.

Feedback from teacher and supervisor

- Presentation and group work is challinging, but it is nice to give the students exxperience doing it.

- Connecting privacy to games seems like a good approach as the students are interested in games.
- The instructions could have been clearer. The students needs clear and simple instructions.

7.5 Feedback by co-creators

7.5.1 Purpose

As the workshop started as a collaboration it was natural to present the changes, the reasons behind them, and some observations about them with the collaborators.

7.5.2 Participants

The participants were the two master students that were part of the collaboration that created the workshop.

7.5.3 Data Collection

The participants had been informed of the changes beforehand in a session that were cut short. This session started with asking the participants to reflect on the workshop runs we did together and think about problems. Then the changes made to the workshop and the motivation behind them were then presented. The participants gave feedback in-between and after the changes and the reasoning behind the changes. Lastly were some of my own observations and concerns shared and discussed. Data was collected by taking notes during discussion of these three topics.

7.5.4 Result

When looking back on the runs of the workshop done together, that is to say USS1, and UNI2, the ideas started out well enough, but suffered when the groups had to make everything fit together. With everything are reality, meaning and play meant. The ideas seemed good after meaning, but got less privacy related after the play part.

The last two parts, "Play" and "Technology" was very similar and most of the groups selected computer / mobile as technology.

Having the students present their ideas trough the workshop were also a bit difficult. Some struggled with what to say as what they had noted were left at the table were they worked as it was hard to bring with them. The understanding and impression of the game were also strongly affected by how well the student presented the idea. How well

the student presented the ideas probably affected the other students impression of the game and the voting done during the first run.

It is probably hard for others to run the workshop as the goals are not communicated well enough trough the workshop as it was the the time of the first and second run. The facilitators have to help the participants form an idea of what they are supposed to do and what the goal are. As it was as of the first and second run the guidance questions and the goal were competing a bit. The participants in the first and second run seemed to use the questions well and answer them, but this did in some cases result in that they missed the goal of the part as they just answered the questions straight instead of using them of a way to guide their discussion to form ideas. Removing the questions would probably result in that the groups does not write down their ideas well.

The changes done to improve the workshop as a tool for raising awareness in a classroom setting seems reasonable when taking the restrictions of the setting the workshop is run in, the challenges in the first and second run and the motivations given to support the changes.

The workshop still has a lot of lose pieces that makes preparing and running it a bit of a hazel.

7.6 Discussion

7.6.1 Focus Group

Some of the main challenges with the workshop reported in the focus group were that is was not connected with the course they were taking. This is not the purpose of the workshop so it makes sense. This feedback can however be used to create instructions for running the workshop as idea-generation adapted to a specific course. Lack of time was pointed out. This indicates that having some time limits for choosing is required to prevent using to much time on selecting what to ideate around. It would probably also suite the goal of the students participating in this particular run to have more time when running the workshop. The feedback from the students as well as the game ideas produced shows that privacy should have been a stronger part of the workshop. This reinforces our belief that the privacy presentation and warm-up activity at the beginning of the workshop is essential to create a focus on privacy, make the workshop start a bit smoother, and help stimulate the discussion in the groups.

The feedback from the focus group on the changes done with the workshop was overall positive. With some suggestions to have the participants create something to show for as the output of the workshop, e.g an A3 poster. The changes presented seems to address the pain points stated by the focus group participants, mainly making sure the focus is on privacy, lack of connection between the parts, and to little time.

7.6.2 LSS3

This was the first run with secondary school students. It was surprising that the students just got to work and there was no need to remind them to take decisions or write things down. In the previous runs many of the groups had been stuck before we talked to them, or had to be reminded to write things down or to select and move further. The groups did miss the goal of multiple of the parts. So this age group seems to just work without questioning what they do as much as the older students.

The incident were multiple of the groups ended up changing privacy issue to payment issues was interesting. It is hard to say how much they were affected. Some of the groups were thinking along those lines and some of the groups seemed to not have such a strong idea of what their issue was. Would the same have happened if they had had a stronger idea of what their problem was?

The warm-up activity seem fun, but is it really necessary. The students ands up focusing on some of the topics present in the Kahooth!. The Kahooth! is not strong in showing relevant privacy topics. Removing it and focusing more on the presentation makes more sense.

7.6.3 LSS5

As part of the presentation two videos about privacy and privacy on the Internet was shown. These videos was a bit darker, political and technical than they needed to be. In the Norwegian presentation videos from `http://dubestemmer.no` was used. These videos had less content about privacy and was less clear, but were also not as dark and more fun. We think making videos for the workshop would be better as the video material found so far does not fit well. We think using videos as part of the workshop will improve the workshop as it helps the teacher doing the workshop as well as keep the content more consistent and to some degree less dependent on the teachers knowledge of privacy.

As the teacher asked for clarifications and stressed the importance of keeping the instructions simple, doing another round to simplify the instructions is would improve the workshop. Removing the guidance questions would simplify the instructions as then there is only the goals for each part and the main goal of a serious privacy game. Removing the questions might result in less written down or to making the workshop harder.

Multiple of the groups answered the guidance questions next to the question instead of in the dedicated text area. This suggest that the cards could be improved. If the guidance questions is not removed restructuring the cards with own text fields for each question or some other restructuring would improve the question cards.

The instruction "modify a game" seems unclear. Some of the groups ended up

adding some clause that is displayed when playing the game, but what is meant is that the way the player interacts with the game should be affected in some way.

Some of the students created analog games that did not require technology as we had thought of it in the workshop. This is something that would be interesting to look more into. Having analog games could allow the students to create the privacy games and actually play them.

7.6.4 Feedback from co-creators

The feedback from the co-creators confirms that the main challenges with the workshop was the time scope of the workshop and not losing privacy as the main goal during the different parts in the workshop. As commented by the workshop expert in section 6.3 2 hours is a short time for a workshop. Doing the privacy presentation as a whole class and give the students homework to research the privacy topics they would work with, by giving them some articles to read would could be a way to improve the outcome and make the focus on privacy even stronger.

Chapter 8

Conclusion

8.1 Summary

This projects started out with the mission of creating a tool that could be used by children and young adults to raise their awareness of privacy. The initial idea was the creation of a serious game communicating the importance of privacy. During the preliminary work of the project, a workshop was created and held to gather ideas for serious privacy games. The interaction and discussion this workshop facilitated were interesting enough to abandon the idea of creating a game, and instead work on improving the workshop to in itself raise awareness.

The workshop created has been tested both as an idea generation tool and as a tool to be used by teachers to facilitate discussion of privacy in a classroom setting trough co-development of serious games. The workshop provides a set of privacy topics as well as a process of developing a simple, serious games focusing on one of the topics. In addition to the workshop, a large set of news articles been collected and made available as reference material.

The workshop has been tested with six classes in both Norwegian and English with children aged 13-15, secondary school students aged 15-18, and university students. Feedback from participants of the workshop shows that the workshop is not too challenging for the intended target group, 13-18-year-olds. That it works as a tool for creating ideas for serious privacy games. Moreover, that the workshop was not boring for the participants.

8.2 Contributions

To look at what contributions this project has made we need to go back to the research question and see if we can answer it.

RQ 1: How can co-design of serious games be used to evoke awareness about privacy in children and young adults?

RQ 1.1: Can co-design of serious games about privacy with children and young adults result in relevant game concepts, given the participants receives an introduction to privacy?

Ideas generated by the participants of the workshop has yielded relevant and interesting game concepts provided they were given enough background information and properly facilitated.

RQ 1.2: Can participating in a co-design workshop raise awareness of privacy in children and young adults?

The project has shown that in participating in the workshop the students have gained some knowledge about privacy, and that most of the students have reported that they will be more aware privacy in the future, with some exception stating they are already aware enough of privacy issues, or that they don't care / the cost outweigh the benefits.

This project shows that co-design of serious games can be used to evoke awareness in children and young adults by being a participant of the workshop as well as by generating relevant ideas for serious games that can be created and shared to raise awareness.

8.3 Limitations

The questions used to gather feedback could have been better and more relevant. This is extrapolated by participants answering surveys in unintended ways, and by modifications done to the surveys used to gather the necessary information to improve the artifact created in the project, as well as to evaluate the project properly.

This project did not look into group dynamics or teaching. Future awareness of a participants privacy awareness is based on self-reporting which can be inaccurate. This limitation was discovered in conversation with a teacher after one of the workshop executions. This is discussed in section 7.2.4

Running the workshops was a demanding task balancing the facilitator's attention between observing, facilitating, and just keeping the class calm and focused. Running the workshop with more people, as done in the first runs of the workshop, could have improved the facilitation during the workshop and the observations done during the workshop. This workshop is intended to be executed by teachers, but it was not feasible to test this within the scope of this master.

8.4 Further work

8.4.1 Custom videos

The videos used as part of the background presentation could be improved by creating custom videos for the workshop. Using videos as part of the workshop worked well, but the videos used needs to explain privacy, therefore, and clearly, and why it is important, without being too technical, dark, or political. This can be done as presentation, but having video material seemed to make the students focus a bit more on a topic that can be boring.

8.4.2 Question cards

Removing the guidance questions from the question cards and instead stating the goal of each part could yield better results, as it gives the students one and only one goal for each part. It could, however, make it harder for the students to generate ideas and to write their idea down. Hard to say.

8.4.3 Technology / Reality cards

Adding/modifying technology and reality cards would be interesting. For technology cards such as "facebook game" could be added and for reality cards "data breaches" is an interesting topic that is not present. Experimenting more with how these cards affect the ideas generated and how abstract they should be, would be interesting.

8.4.4 Analog Games

Some of the groups participating in the workshop created analog game ideas. Restricting the groups to create games that they could easily make in class and play, could be an interesting way of changing the workshop to create games that can be used within a short period.

8.4.5 Teachers as facilitators

Running the workshop with teachers, or other people, as the facilitator would be interesting to confirm that the workshop instructions are clear enough for others to facilitate the workshop, and for teachers to use it in a class setting.

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Appendix A

Paper submitted to ICEC

Supporting the co-design of games for privacy awareness

Omitted for anonymity[1]

[1] *Omitted*

omitted

Abstract. Privacy is a well-known concern connected to teenagers´ usage of e.g., social media, mobile apps, and wearables. Games have recently been proposed as a tool to increase awareness of privacy concerns. It is however important that these games are relevant and engaging. In this paper, we present a workshop to involve teenagers in the co-design of games to promote privacy awareness, describing the workshop process together with the cards and the board that support the process. We evaluated the workshop together with students between 15-17 years of age divided in groups of 3-4 participants. Results show that all the groups were able to generate interesting game ideas and the workshop was perceived as entertaining. Drawing on observations and participant feedbacks, we reflect on the strengths and limitations of the workshop.

Keywords: Co-design, Game design, Privacy Awareness games.

1 Introduction

Privacy is an ever-growing concern. With the technological development and increase in use of connected devices, data is being collected everywhere. Terms of service are complicated, leaving people unaware of what type of data they share, with whom and what it is used for [17]. The new General Data Protection Regulation (GDPR) in Europe, in effect May 2018, addresses some of these concerns, but individuals still have to be aware of privacy issues and act accordingly in a rather complex context [4].

Teenagers are a user group for which concerns are higher. They are heavy users of digital services and might lack knowledge about data sharing and underestimate the risks. For example, a study conducted by NorSIS [14] shows that only 28,4% of Norwegian youth received training in information security in the last two years.

Serious games have recently emerged as a way for children to learn about sharing of personal data and privacy in an engaging and evoking way. Just to mention a few examples of privacy related serious games (hereafter simply games):

- *Friend Inspector*, described in [3], is a game that aims to raise the privacy awareness of Social Network Sites (SNS) users, like Facebook. The conceptual design of the game focuses on the discrepancies between perceived and actual visibility of shared items. It is a memory-like game where the player is asked to guess the visibility of

an item. To give the user a relevant context, the frame story is based around items shared on the user's own profile.

- *Master F.I.N.D.*, described in [16], also focuses on awareness about privacy risks in SNSs. The game is a fake SNS and is developed to be played individually by teenagers. A player takes the role of a web detective and attempts to solve missions through searching for information on profiles on the fake SNS. An example mission is to try to locate a person at a certain moment.
- *Google's Interland*[1], aims at educating children in four areas of internet security: Cyber bullying, phishing, password creation and sharing awareness. The player controls a character through different games, scoring points for completing tasks, while learning about safe Internet behavior at the same time.

The aim of our research is to investigate how to foster human-centered design of novel games for promoting awareness about privacy by providing tools to engage teenagers in idea generation. Focusing on the recognized importance of the ideation phase in any design method [6], this paper presents a card-based ideation workshop, i.e. a tool supporting the collaborative formulation of initial game concepts. The workshop, called *Privacy Game Co-Design Workshop*, is intended for non-experts, i.e. users without previous knowledge on the field of privacy or formal training in design techniques, with focus on teenagers as the main target group. The proposed workshop is an adaptation of the Triadic Game Design workshop [8]. It provides: (1) a structured process to guide ideation; (2) a board to focus the contribution of the players; and (3) a set of cards to focus on different aspects of the games.

The design of the workshop was an iterative process. We evaluated its usefulness in informing and guiding idea generation during two pilots and a final evaluation with 32 participants divided in 9 groups. Data was collected through observations, questionnaires, artifact analysis, and, for the pilots, a final group interview.

All workshop material is released under a Creative Commons license and available for download at *omitted for anonymity*.

2 Related work and background

The work presented in this paper is positioned in the research that aims at using card-based approaches to promote idea generation and playful user involvement in co-design [15]. As examples, in [12] the authors propose a set of cards and a structured workshop to promote co-design of IoT systems. Similar approaches are also used in game design, as e.g., in the work connected to tangible interfaces for learning games [5], for exertion games [13]; and to design for playfulness [11]. Cards are an effective vehicle to convert theoretical frameworks to guidelines that can be manipulated by designers [5], keeping users at the center of the design process [10, 11] and facilitating creative dialogue and shared understanding. Cards can be a source of inspiration to steer a discussion when it becomes unproductive [11]. Cards facilitate collaborative and divergent thinking by

1. Interland - Be Internet Awesome. Retrieved October 1, 2017 from https://beinternetawesome.withgoogle.com/

providing a medium for conversation between stakeholders and designer [2, 7], and providing a common ground [1]. As summarized in [12], card-based tools are ":..(i) informative: helping to describe complex concepts to non-experts, (ii) inspirational: helping trigger and guide brainstorming and idea generation, (iii) collaborative: engaging users by helping collaboration and creative dialogue…" However, cards should not be seen as stand alone, but rather complemented by clear guidance on how to use them [13], possibly in the context of a structured workshop process.

In this context, we chose the Triadic Game Design [8] workshop as a foundation for our Privacy Game Co-Design Workshop. The Triadic Game Design is intended to support the design of serious games by pushing the designer to address in turn three core perspectives:

1. *Play*: how to make a game entertaining. Only considering this element would be the same as designing a regular game with no learning goals.
2. *Meaning*: how to make the game education. The game designed should provide a value beyond play itself like educating or raising awareness.
3. *Reality*: to ground the game in a specific real-world context.

In order to make a successful serious game, these three perspectives must be balanced, and they can complement each other or be conflicting. The proposed workshop is intended to have a flexible format and to adapt to different needs. In the original version of the workshop, participants are divided in groups of 3-4, and after an ice-breaking activity, they go through different assignments, the first three focusing in turn on each of the three core perspectives listed above plus a last one to bring the three elements together. For each assignment, a deck of cards is provided, identifying possible choices for the participants. In addition, a set of worksheets is used to provide questions that guide the creation of the game as well as space for recording design choices.

The Triadic game design workshop focuses on the creation of concepts rather than technology or graphics. This is the main reason it has been chosen as starting point for the approach proposed in this paper. However, it has been adapted to target privacy and suit better to teenagers.

3 The co-design workshop

The Privacy Game Co-Design Workshop aims to include the target group as participants in a workshop to help generate ideas for serious games focused on privacy awareness. The goal is to be able to run the workshop in a classroom-setting with groups of 3-6 people and therefore generate multiple ideas (Fig. 1). The design of the workshop has been an iterative process. The authors used the Triadic Game Design workshop as a core, and made changes to adjust the workshop time scope, audience and altered the focus from "any" problem to privacy. The resulting workshop includes (1) a structured process to guide ideation; (2) a board to focus the contribution of the players; and (3) a set of 30 cards helping participants to focus on different aspects of the games they are

conceiving. The 30 cards are divided into 7 Reality cards, 1 Meaning card, 14 Play cards and 8 Technology cards.

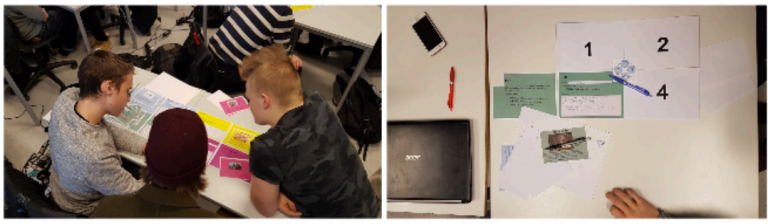

Fig. 1. Students during one of the workshops

3.1 The Process

The Privacy Game Co-Design Workshop is intended to last 2-3 hours. All groups have to sequentially look at the design of their game from 4 different perspectives. In addition to Reality, Meaning, and Play, that are part of the original approach, we have added Technology. This is mainly intended to go beyond traditional video games. Therefore, the workshop has four distinct phases, one for each of the design perspectives. For each phase, groups have to: (i) Open the part of the board connected to the specific design perspective; (ii) Choose or draw a card from the associated deck, (iii) Work on their idea following the prompts on the board, and (iv) Give a 1-minute pitch of their idea.

Each phase should take approximately 30 minutes. It is difficult to set a firm time-limit on each step within the 30 minutes, as they are fluid and often overlap, though Step (iii) should take the most time, as it is where groups generate their ideas.

Rather than an initial ice-breaker activity like in the original workshop, the workshop includes an initial introduction to privacy. Though this initial part might be tailored, we have developed a Kahoot! quiz[2] and a short lecture about: What is privacy? What is online privacy? Risks of sharing personal information with other people/friends, and Risks of sharing personal information with companies or organizations through usage of services. Kahoot! and lecture notes are available at *omitted for anonymity*.

3.2 The Board

The original workshop provides detailed worksheet templates to document design choices. Since we aim at a shorter activity and at the involvement of teenagers, in our adaptation we decided to substitute the worksheets with a board. The board is used: (i) to scaffold the process, (ii) to collect ideas and notes during the process, and (iii) to support cooperation and interaction within the group. Because of its size (A2 format), the board enables 3-4 people to easily work around it.

[2] https://kahoot.com/welcomeback/

At the beginning of the workshop, each group receives a board that they can write on. The board is divided in 4 areas, one for each of the workshop phases (Fig. 1, right). The areas are covered, and the groups have to discover the areas only during the related workshop phase. This is intended to help them focus. When an area is open, there are two sheets supporting the discussion. As an example, Fig. 2 shows the two sheets for the Reality phase. On one side there is a short description of the phase and the steps that have to be followed. On the other, there are some questions that are intended to trigger the discussion within the groups and an area to annotate the discussion and ideas. In the sheet they can also select if they want to address challenges connected to the private sector or related to the use of personal data by companies.

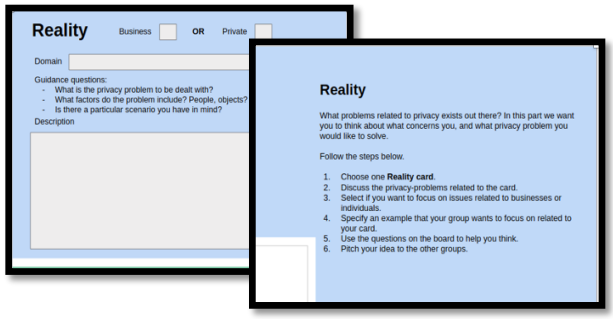

Fig. 2. Board components of *Reality*

3.3 Cards

The Privacy Game Co-Design Workshop uses four sets of cards, one of each phase of the workshop.

- *Reality*. While the original workshop is open to any domain, in our workshop we focus on privacy and all the cards for reality are on privacy, each representing a different privacy scenario that can be addressed in the game. The reality cards are: Location Sharing; Smart Cities (example in Fig. 3, left); Health Devices; Activity Trackers; Social Media; Mobile App Permissions; Loyalty programs. The scenarios have been defined by analyzing cases reported in the media. The list of privacy problems is not exhaustive and can be extended to address other scenarios. The description of the scenarios is, by choice, broad enough to be interpreted in different directions, but still specific enough to provide focus on privacy.
- *Meaning*. The original workshop includes a number of cards for promoting creativity around meaning. However, since the game that we aim at designing are connected to increasing awareness of privacy, we limit to the most relevant card, "Awareness and Attitude", i.e., the developed games will all focus on increasing awareness or change attitude towards data sharing.

- *Play*. The cards to support participants in thinking about different types of game are the same than in the Triadic workshop, but text has been simplified to fit better to the target group and the game examples have been updated.
- *Technology*. This deck of cards does not exist in the original workshop, but we have introduced it to promote the development of games that use a broader spectrum of technologies. Technology cards specify what kind of technology the serious game will be utilizing. Having a specific technology to design the game for may help the participants to move away from traditional PC games and promote creativity. The technology cards are: Augmented Reality (example in Fig. 3, right); Virtual Reality; Mobile； Computer; Console; Interactive Surfaces; Interactive Devices.

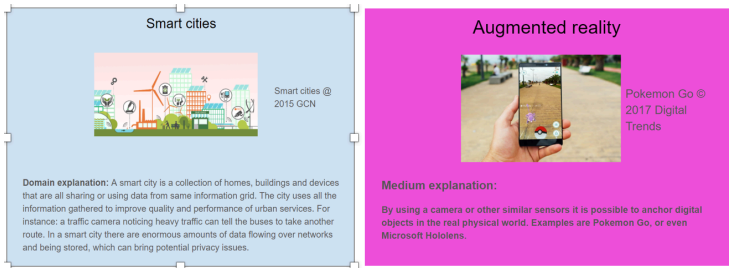

Fig. 3. Example of a Reality card (left) and a Technology Card (right)

4 User studies

The workshop has been evaluated through two small pilots, mainly intended to fine-tune the workshop, and then a larger evaluation. Data was collected through: a questionnaire using a 1-5 Likert-scale and focusing on fun and perceived difficulty level; artifact analysis, i.e. the annotated boards; and observations by three of the co-authors who also acted as facilitators, with individual observations discussed in the team after the workshop. For the two pilots, the study also included an audio recorded group interview with all participants. The researchers sought to have a free group discussion, without a structured set of questions in order not to constrain what the participants might say, as discussed in [4]. For the final evaluation, no final interview was conducted because being in a school there were more time constraints.

The participants to the studies were all teenagers in upper secondary schools. The first pilot was conducted with 3 participants who were spending two weeks at the university as part of their vocational education in ICT (Information and Communication Technology) and service design. The second pilot was conducted with 6 participants that were working at the university as part of a national program for which students in secondary schools can work one day in companies to collect money for a charity. The first group was therefore not compensated, whereas the second group received indirect compensation, circa 50 euro each, to charity. The final evaluation was conducted with two classes of a school with specialization in ICT, with a total of 32 students divided

in 9 groups. The pilots were conducted at the university premises, while the final evaluation was conducted at the school. Participation of girls was very low, with only two girls attending the second pilot and 1 the final evaluation. We therefore do not perform any analysis of gender issues.

The first pilot was conducted with an earlier version of the workshop. The workshop was then revised based on the results. The workshop as described in the previous section is the one resulting from this revision and it is the version that is evaluated in the second pilot and in the final study.

4.1 Results from the pilots

During the first pilot, the 3 students were put into one group. Participants were given a first version of the board, the Privacy cards as described above, all the Play and Meaning cards in the original Triadic workshop (updated and simplified), and the Technology cards. The group was able to conceive a relevant and interesting game idea, but they did get stuck on several occasions, and they needed help to get back on track. They also struggled to detach their ideas from the game examples in the cards. However, the questionnaire results show that the participants enjoyed the workshop. Their answers suggest that Part 1 (Reality) was the most boring, with a fun rating of 3.33, and the most difficult to combine with the other elements. They all stated that they had sufficient time for each part. The group discussion after the workshop confirmed the observations. The main concern of the participants was the difficulty to put together all the previous steps in the final game, especially the scenario from the Reality phase. As stated by one of the participants: "*Combining three of the parts wasn't difficult, but getting Reality to fit in was very challenging*."; and as stated by another one: "*The difficult part is to make the privacy an essential part of the game while still keeping it interesting*". Discussing the Meaning cards after the workshop, there was also a general consensus that many of the cards in the deck are difficult to understand, and that "Attitude" is the card best related to privacy risks. Many of the meaning cards wouldn't actually make sense in the given context.
As a result of the evaluation, the following changes were made:

- Participants are able to choose the Reality card (privacy scenario) they want to work with, but all the cards are presented at the beginning of the process. Combining all the elements proved too difficult, and Reality the most difficult one to incorporate. By letting the participants choose reality card it will be something they understand.
- All the Meaning cards are removed from the deck, except for the "Attitude and Awareness" to focus on the fact that the games that have to be designed are aimed at changing attitudes and increase awareness, not developing any generic skill.
- Redesign of the board to use better the available space, but also to help participants to concentrate more on the task at hand.

The participants of the second pilot were divided in two groups. Both groups were able to generate a relevant game. The process was smoother, with less breakdowns. The results from the questionnaires confirm the observations. The participants appreciated

the presentation of each reality card before they selected one, as opposed to Pilot 1 where they drew a card blindly. As one participant stated:
"It was nice to be able to choose [reality card]. It made it easier to come up with interesting angles for the game. The Play part was more difficult since the genres were untraditional and we had to think outside the box."
Facilitator: "*Is that a bad thing*?" "*No, creating yet another Call of Duty2* [a successful first-person shooter game] *would have been boring. It was fun but challenging*."
In the second pilot there was no evidence that Phase 4 (working on technology and combining all previous parts) was hard. The fun-rating of part 4 was also higher than in Pilot 1. The groups felt they had sufficient time for each task, supporting the results from the first iteration. As a result of the second pilot only minor changes to the text on some cards and on the board were introduced.

4.2 Results from the main evaluation

The participants seemed to enjoy the workshop and worked well with the tasks, though they had to be reminded frequently to write down their ideas in the board. The different phases received increasing higher score in the questionnaire, with the last phase receiving the highest score, over 4 on average. The workshop seems to hit an appropriate difficulty level, with 23 out of 32 participants reporting the workshop to be neither easy nor hard, and only 2 experiencing it as difficult. Most of the participants also felt that they had enough time for the workshop (26 out of 32).

A general positive attitude was also observed during the pitches, during which students seemed to enjoy presenting their ideas and listening to what the other groups had done. It is however worth to note that some of the pitches were very effective in presenting the ideas, while others were harder to follow, with poorer explanation of the context. Questions had to be asked to facilitate the pitching and clarify details.

The proposed game ideas were evaluated by the three facilitators when the groups performed their final pitch. The average of these scores can be seen in Fig. 4. The facilitators independently rated the ideas based on:

- Privacy Scenario, how well defined the problem statement/scenario was. Did they think of the different roles, why it is a problem, provide an example.
- Raising Awareness, did the participants find a problem to promote awareness for? Did they find a game, and did they modify it in a meaningful way?
- Entertainment Value, did they define goals, rules, and story for the game? Did it seem like a fun game to play?
- Innovative, did the group come up with a creative new game concept? Did they combine existing concepts in an interesting way?
- Overall Impression, the subjective overall impression.

The maximum possible score was 50 points, the highest given score 39 and the lowest just above 28. Most of the scores were in the mid 30's range. Most of the groups scored high on innovative thinking, with 7 of 9 groups with a score of more than 7 out of 10.

Table 1 provides an overview of the game ideas generated during the final evaluation, specifying which cards have been used, the game concept, and the score.

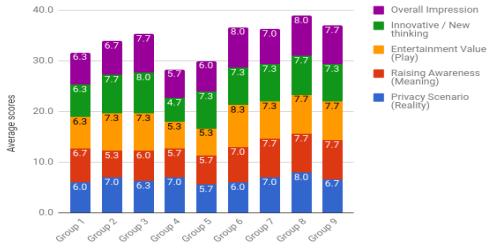

Fig. 4. The average scores for each group in the five aspects their ideas were rated.

Table 1. Table showing selected cards, game concept, and total score evaluating the game.

ID	Reality	Play	Tech.	Game concept	Sc.
1	Social Media (Business)	Strategy	Aug. Reality	The player explores the real world and using his phone with AR can hack the information of virtual companies. The information can be traded for money and other goods.	31,7
2	Social Media (Private)	Shooter	Virtual Reality	Your job is to explore the world and detect fake profiles on Tinder. By using a shotgun you exterminate the fake users one by one.	34,0
3	Social Media (P)	RPG + Adventure[1]	Virtual Reality	In a VR world the player takes pictures of objects and post them to social media. This can give the player fame, or have grave consequences if wrong picture is posted.	35,3
4	Smart Cities (B)	Survival Horror	Console	The player must survive in a smart city using stealth to not be detected by the government or hacked.	28,3
5	App Permissions (P)	Survival Horror	Computer	A puzzle game where the player give permission to all his personal information. If he doesn't finish the puzzle everything is posted to social media.	30,0
6	Smart Cities (P)	Adventure, Survival Horror	Console	A game where the state has gathered a lot of personal data about the player in a post-apocalyptic setting, and the player must prevent them from abusing it.	36,7

7	Health Devices (P)	Platform	Computer	Open world game, player is prompted to share private information. Can interact with other people to learn from mistakes.	36,3
8	Social media + Mobile App (P)	Adven-ture	Computer	The player discovers that an SNS uses private information illegally and must decide what to do in a decision-based game.	39
9	Smart Cities (P)	Action	Computer	First person stealth game, where the player attempts to infiltrate and take down an "evil" organization that abuses personal data without giving away personal data.	37

5 DISCUSSION

The Privacy Game Co-Design Workshop proved successful in supporting the co-design of serious games for privacy awareness. The results show that, in a limited amount of time, the participants were able to:

- Select and elaborate a privacy-related scenario
- Give a meaning to an existing game, i.e. turning an existing game into a game with a learning purpose
- Come up with a fun new game in a specific genre
- Reflect and combine the elements into one serious game for privacy awareness.

On the overall, the changes made to the original workshop are evaluated positively for the intended purpose. The workshop was perceived by students as an engaging activity and all the groups managed to come up with relevant ideas. As shown in Table 1, the groups produced ideas for different scenarios. It is interesting to underline that only 4 out of 9 ideas are related to social media, that is what normally students get information about. Also, 5 ideas do not use the computer as underlying technology, again increasing the potential innovativeness of the game.

Having a structured *process* proved to support generation of creative ideas. Through the different phases participants focus on different perspective of serious games and advance their design. In the pilot tests we experimented with letting the participants choose all their cards, as opposed to draw them, but feedback showed that this only lead to confusion. The participants were often excited to include different cards that did not seem to fit together, i.e., Social Media, Virtual Reality and Role-Playing Games. The resulting game idea was often very innovative and successful. That creativity permeates the entire process is also visible in the results, with 7 out of the 9 final game ideas receiving high scores on innovation.

The *cards* played their expected role of informing participants about different options, triggering discussion and idea generation, and promoting cooperation providing specific concepts for focus on.

The *board* provided a focal point for group interaction and scaffolding of the process, by providing different hints about the process as well as triggers to help the group to focus. The evaluation revealed however that the participants did not use the board as much as intended, often forgetting about the guidance questions meant to help their creative process. This might result in games that are less elaborated as well as in a more frustrating process. It is also important to note that the boards are an important outcome of the co-design workshop and are essential for designers who want to take the games further. It is therefore important that the workshop facilitator makes sure to give clear instructions and reminds participants about the proper use of the board.

Several of the games designed by the participants could be promising tools to raise privacy awareness. A challenge with advancing the ideas to game development is that they are often very complex as well as costly and difficult to realize. However, asking the participants to only create simple games is very likely to hinder their creative process and affect the final ideas. It is also important to note that the facilitators of the workshop are not necessarily looking for a final concept to implement, but rather ideas that can be combined or used as inspiration for creation of relevant serious games.

A recurring theme in the games from the workshop is to raise awareness by having in-game actions result in consequences. This applies to both negative actions, such as over-sharing of information, and positive actions, such as making good decisions. A drawback of using consequences of all actions as a mechanism to teach privacy awareness is that it requires a lot of resources in development to foresee and design all possible outcomes in the serious game.

The proposed workshop is intended to last between 2-3 hours to provide an activity that can easily be integrated into a busy school day. However, the evaluation shows that an extension of the activity might be beneficial. In particular, if there is time, the facilitator might consider using more time to provide: a more extensive introduction to privacy; more time for discussion after the pitches to generate knowledge exchange among the groups; starting a class discussion among the ideas.

6 CONCLUSIONS

In this paper we presented a workshop to promote co-design of games aimed at promoting awareness of privacy among teenagers. The workshop includes a structured process to be used together with a board and cards. The workshop is an adaptation of the Triadic Game Design Workshop previously proposed in the literature. In addition to a general update of the cards proposed in the original workshop, the main proposed changes include a focus on privacy through the introduction of a deck of cards capturing different privacy scenarios; the introduction of a technology perspective and related cards, to promote the design of games adopting novel interaction approaches; the introduction of a board to scaffold the process and promote cooperation. The workshop has successfully been evaluated with 32 students.

The participants of the main evaluation were all ICT students aged 15-17, with only one girl. The workshop needs therefore to be evaluated with a more diverse population. As part of our future work, we also aim at studying how the workshop can be used not only as a co-design tool, but also as a tool to promote learning of privacy in schools.

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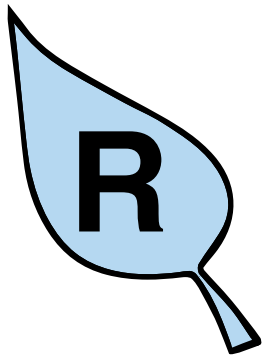
Appendix B

Workshop Artifacts



1 - Reality

3 - Play

Reality

What problems related to privacy exists out there? In this part we want you to think about what concerns you, and what privacy problem you would like to solve.

Follow the steps below:

1. Choose one **Reality card**
2. Discuss the **privacy problems** related to the card.
3. Create a situation about the **privacy problem** you have selected.
4. Use the questions on the question card to help you think.
5. Explain your idea to the other groups.

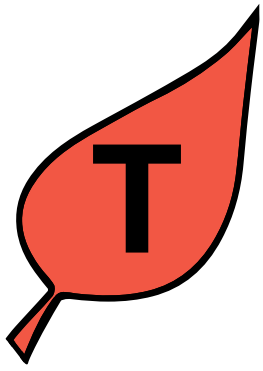
Play

What makes a game fun to play? In this part we want you to think about what makes a game fun to play, and try to create a new exciting game in a given genre.

Follow the steps below:

1. Think of what **genre** the game you selected in the meaning part is, and of the how you raised **awareness** about your **privacy problem**
2. Build a game that raises **awareness** of your **privacy problem** in this **genre**
3. Use the questions on the question card to help you think.
4. Draw 4 scenes from the game.
5. Explain your idea to the other groups.

2 - Meaning



4 - Technology

Meaning 

How can a game be meaningful? In this part we want you to think about how existing games can be changed to have a meaning, and increase the awareness or change the attitude of the player.

Follow the steps below:

1. Choose a game the majority of the group enjoys.
2. Make sure everyone in the groups understand how the game works.
3. Change one or more elements of the game so that it raises awareness about the **privacy problem** identified in the reality part.
4. Use the questions on the question card to help you think.
5. Explain your idea to the other groups.

Technology 

What remains is to combine your **privacy problem**, ways of raising **awareness**, game **genre**, with a **technology**.

Follow the steps below:

1. Draw one **Technology card**.
2. Combine the previous parts into one successful Serious Game!
3. Use the questions on the question card to help you think.
4. Explain your idea to the other groups.

Smart cities

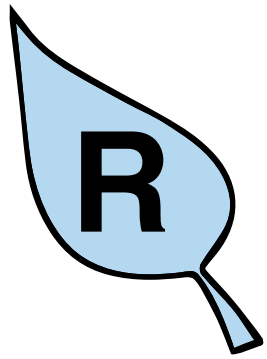
Smart cities @ 2015 GCN

Domain explanation: A smart city is a collection of homes, buildings and devices that are all sharing or using data from same information grid. The city uses all the information gathered to improve quality and performance of urban services. For instance: a traffic camera noticing heavy traffic can tell the buses to take another route. In a smart city there are enormous amounts of data flowing over networks and being stored, which can bring potential privacy issues.

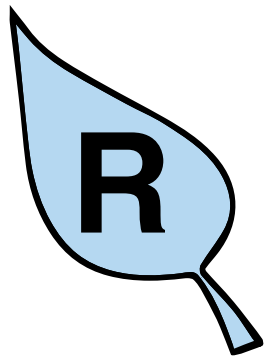
Location Sharing

Location sharing @2017 Cyber Pshyche

Domain explanation: More and more applications and devices are embedding location into their services. This information can be used to give improved service to the user, such as automatically filling in the closest bus-stop, but also be exploited, abused and sold to e.g. give targeted ads. Sharing your location with "friends" can be valuable at times, but can also be misused by thieves.



Reality Card



Reality Card

Health devices

Health devices © Ferret 2013

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Activity trackers © 2015 BuzzFeed

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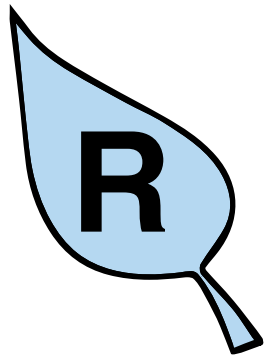
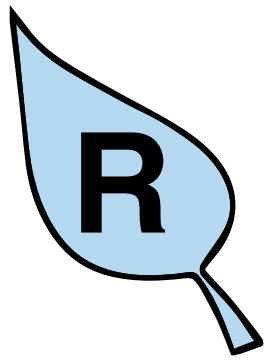


Reality Card



Reality Card

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Social media @2017 softloom

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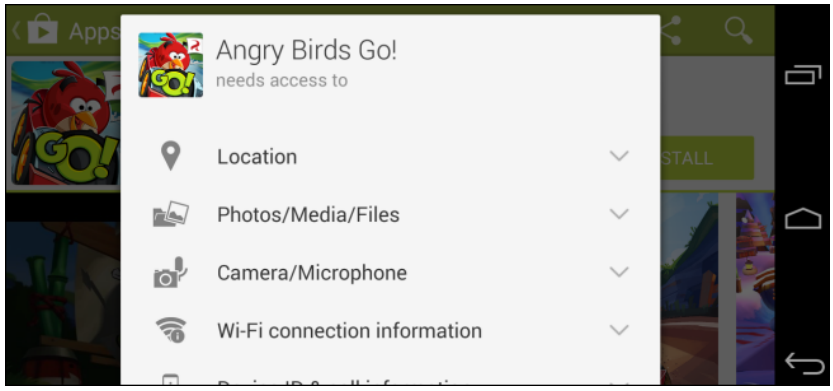
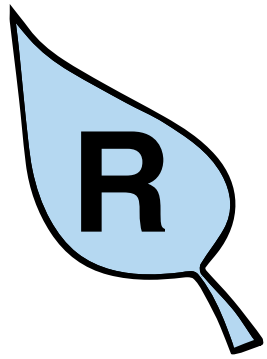
Mobile app permissions

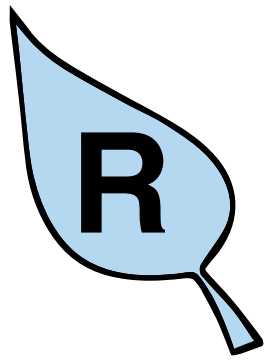


Mobile app permissions @2014 How-to-geek

Domain explanation: Many mobile applications are "overprivileged". Meaning that they have access to more information on the device than they need. Why did Pokemon Go need access to your Contacts and Photos? Applications with access to too much information can abuse this, and depending on their Terms and Services sell your information to third parties.



Reality Card



Reality Card

Loyalty programs

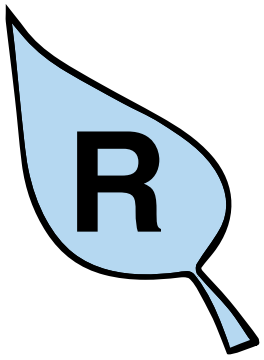
Æ © 2017 Rema 1000

Domain explanation: Loyalty programs gives the customer personalized discounts. In return for these discounts the customer gives up a lot of data about themselves. Information of what items they buy, when, how often, how much are some examples of this. This information can be used to improve the business but it can also tell a lot about a person.

Awareness

The McDonald's Game © 2006 Molleindustria

Domain explanation: Awareness is about making informed and thoughtful decisions. A game that aims to raise awareness or change the attitude attempts to make the player more aware about the decisions they make related to a certain topic. That topic may be a major world problem or an everyday issue. An example is The McDonald's Game which raises awareness about the flaws of the fast-food industry.



Reality Card

Meaning Card

Augmented reality

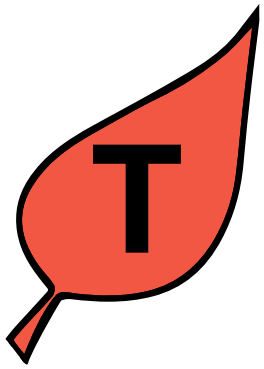
Pokemon Go © 2017 Digital Trends

Medium explanation: By using a camera or other similar sensors it is possible to anchor digital objects in the real physical world. Examples are Pokemon Go, or even Microsoft Hololens.

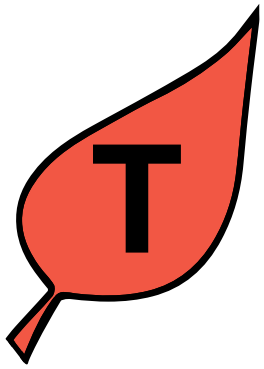
Computer

Computer games © 2017 Life Wire

Medium explanation: The typical computer games require input from mouse and/or keyboard. They can be complex or simple, and available in the web-browser or directly on the computer itself.



Technology Card



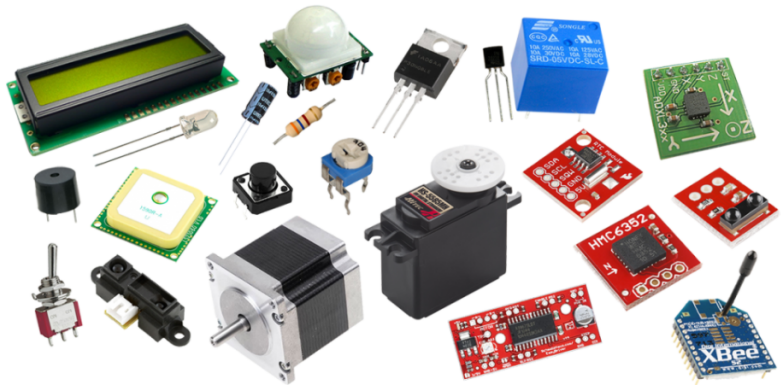
Technology Card

Console

Consoles © 2017 Smartronic

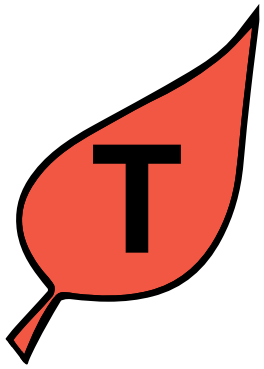
Medium explanation: Games on gaming-consoles are typically played with a hand held controller. They can be complex or simple, and often involves a lot of action.

Interactive Devices



Interactive Devices ©2017 codebender's blog

Medium explanation: By using sensors, actuators (a device that converts energy into motion), and the Internet anything can become a video-game! An Arduino connected to a moisture sensor can make watering the plants a game. The opportunities are endless.



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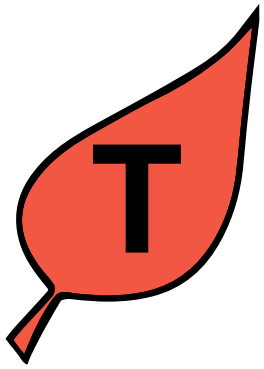


Technology Card

Interactive Surfaces

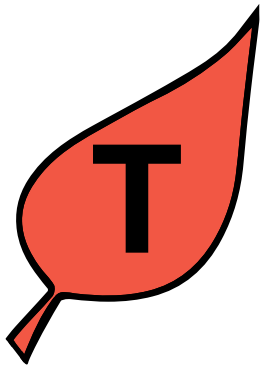
Interactive Devices © 2012 Disney Research

Medium explanation: By using screens, sensors, and the Internet any surface can become a video-game! An ordinary board-game can be transformed into a new digital one with many more opportunities.

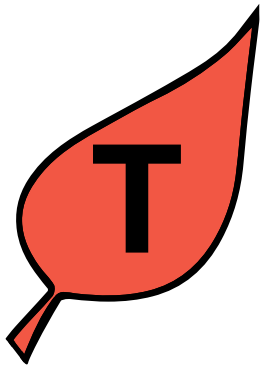
Mobile

Mobile games © 2016 Mobile shop

Medium explanation: With "everyone" owning a smart phone, it is also natural to play games on it. Mobile games are typically simple but addicting games with the possibility to play whenever wherever.



Technology Card



Technology Card

Virtual Reality

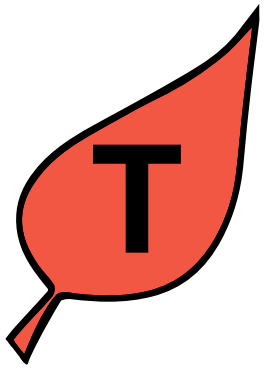
Tamagotchi © 2005 Tomasz Sienicki

Medium explanation: A device that can use buttons, sensors or other forms of input. The device is not connected to anything.

Own Devices

Tamagotchi © 2005 Tomasz Sienicki

Medium explanation: A device that can use buttons, sensors or other forms of input. The device is not connected to anything.



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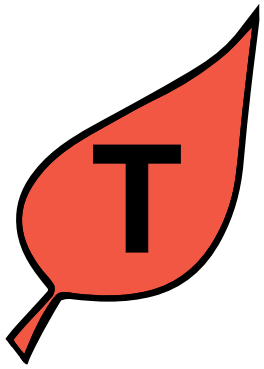


Technology Card

Reality

Group Nr:

Problem

Guidance questions:

- What is the privacy problem to be dealt with?
- What parts does the problem consist of? People, object, organizations?
- Tell a story with the problem, and its parts.

Description:

Meaning

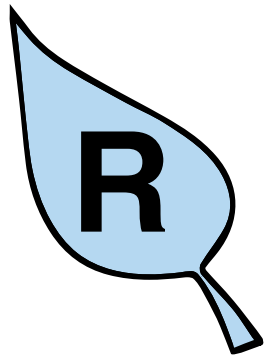
Group Nr:

Game

Guidance questions:

- What game will you change?
- How will you change the game?
- Why do you change the game in this way?

Description:



Reality Question Card

Reality Question Card

Play

Group Nr:

Genre

Guidance questions:

- What do the players try to achieve? What are their **goals**?
- What can, and can't the player do? What are the games **rules**?
- Build a **story** based on the games **goals** and **rules**.

Description:

Technolgy

Group Nr:

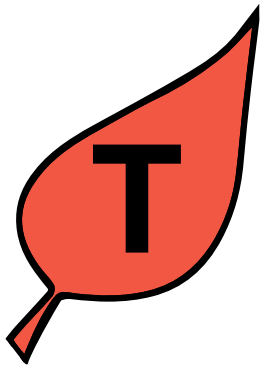
Technology

Guidance questions:

- How will the player interact with the game?
- What are the advantages of creating your game for this technology?
- What are the limitations of creating your game for this technology?

Description:

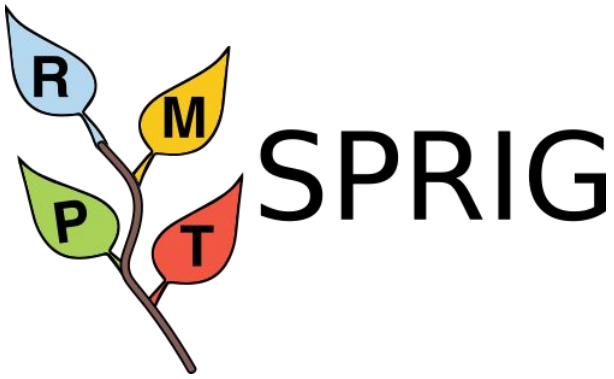
Play Question Card



Technology Question Card

Appendix C

Presentation



Serious Privacy Game Workshop

What is this?

- This workshop is part of a master project at computer science at NTNU
- As this is part of a master project some data will be collected:
  - Surveys before and after the workshop
  - Observations during the workshop
  - The ideas generated by the workshop group at the end of the workshop
  - Audio recording of presentation of game ideas
  - Photos of the group layout and of how you interact with the board.

Goal

To make a game that raises awareness about privacy while we think about privacy in groups.

Plan

Time	Activity	Varighet
12:30	Introduction	10 min
12:40	Privacy and the internett	10 min
12:50	Game idea workshop	~1.5t
~14:45	Done	

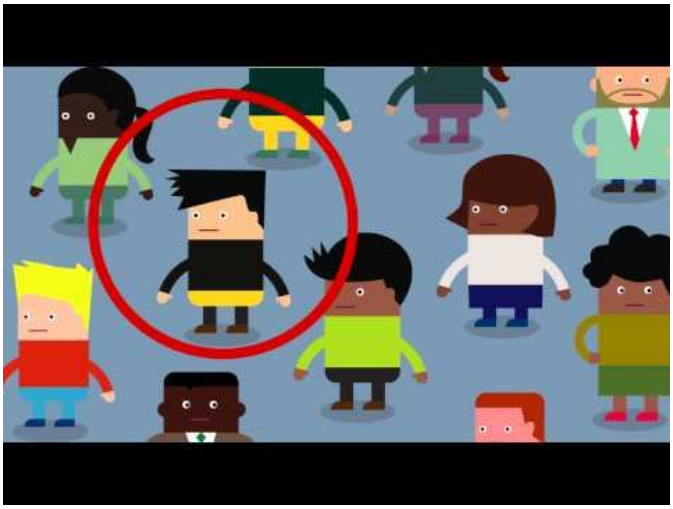
What is privacy?

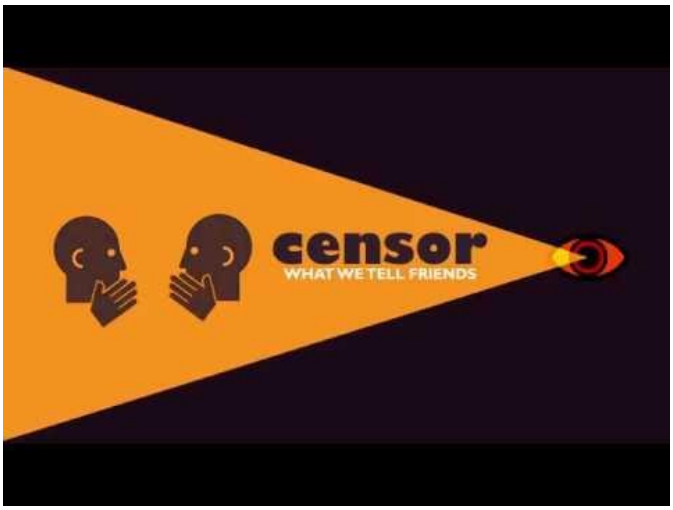
Privacy means that everyone has the right to control what they share with others.

You should be able to have secrets.

Privacy also means that others are not allowed to share false rumors about you.

http://barneombudet.no/dine-rettigheter/til-a-vaere-meg/privatliv/





Privacy summary

Privacy

Privacy online

Why privacy matters

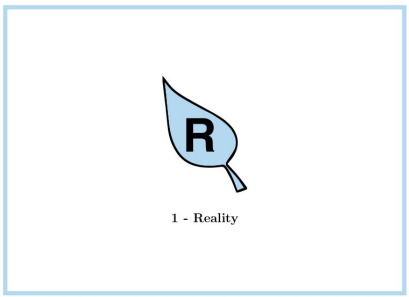
The tradeoffs

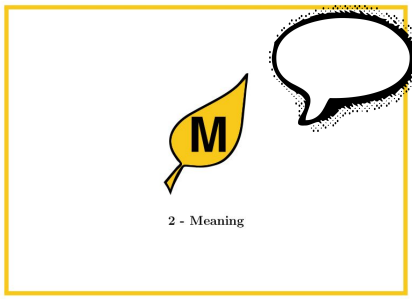
Serious Games

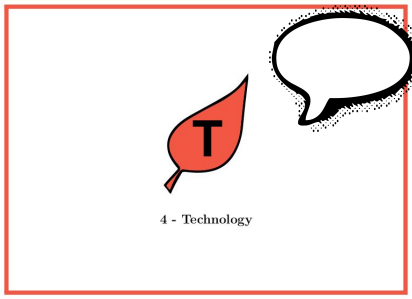
Goal

To make a game that raises awareness about privacy while we think about privacy in groups.

Workshop overview







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nrk

Nyheter Sport TV Radio Distrikt Søk

Norge Siste nytt Dokumentar Klima NRK Ytring

– Det vi bruker strøm på, sier mye om hvordan vi lever

Montører landet rundt er i full gang med å installere nye strømmålere i norske hjem. Datatilsynet advarer mot at de nye målerne kan registrere informasjon som kan gi andre innblikk i privatlivet ditt.

Trude Furuly
Journalist

Hans Jørgen Solli
Journalist

Publisert 14. feb. 2017 kl. 20:11

Artikkelen er mer enn ett år gammel.

ARBEIDET ER I GANG: Over 400 000 strømkunder har allerede fått ny måler, og i løpet av året får 1,4 millioner strømkunder besøk av en montør.
FOTO: PAUL KLEIVEN / NTB SCANPIX

GIZMODO

VIDEO SPLOID PALEOFUTURE IO9 SCIENCE REVIEW FIELD GUIDE DESIGN

The House That Spied on Me

Kashmir Hill and Surya Mattu
2/07/18 1:25pm

552.1K 313 55

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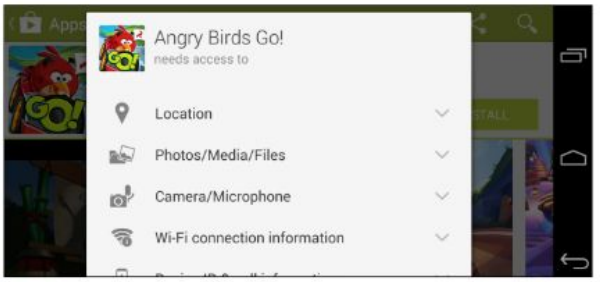

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Æ © 2017 Rema 1000

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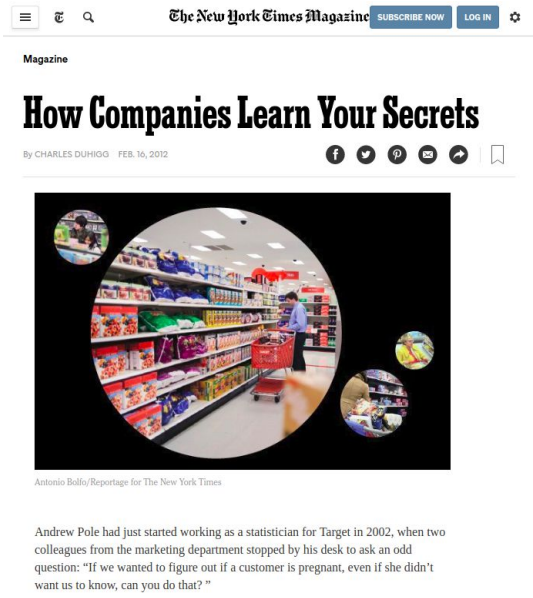


The New York Times Magazine SUBSCRIBE NOW LOG IN

Magazine

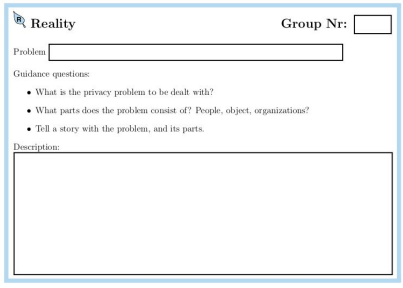
How Companies Learn Your Secrets

By CHARLES DUHIGG FEB. 16, 2012

Antonio Bolfo/Reportage for The New York Times

Andrew Pole had just started working as a statistician for Target in 2002, when two colleagues from the marketing department stopped by his desk to ask an odd question: "If we wanted to figure out if a customer is pregnant, even if she didn't want us to know, can you do that? "

Reality: create a privacy problem



Reality Group Nr:

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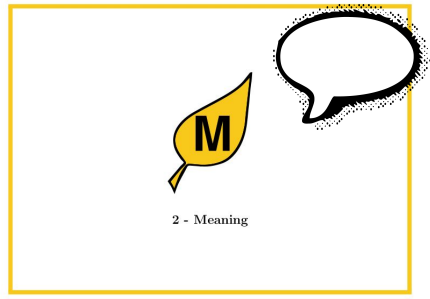
Description:

P

3 - Play

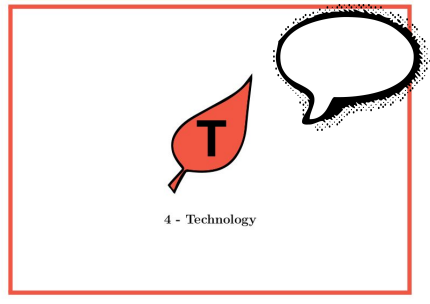
P

3 - Play



M

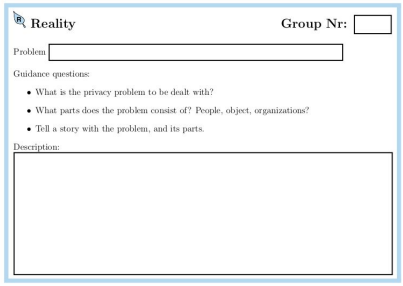
2 - Meaning

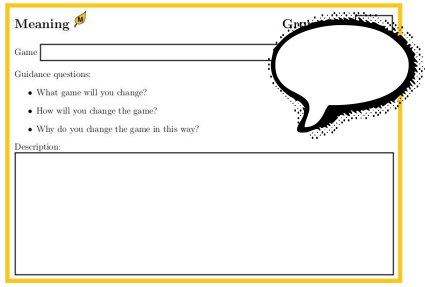


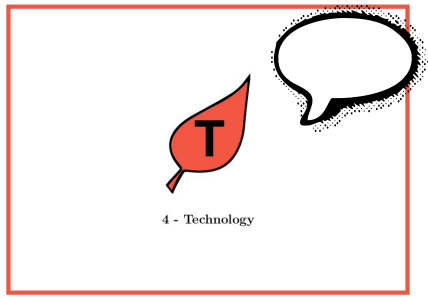
T

4 - Technology

Meaning: increase awareness





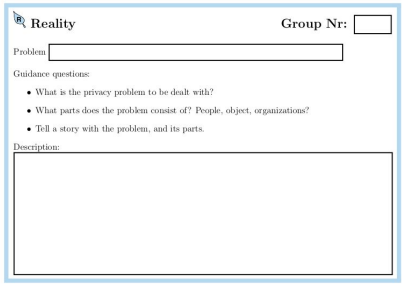


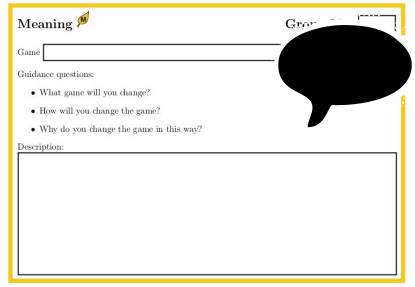
Presentation 5 min notice

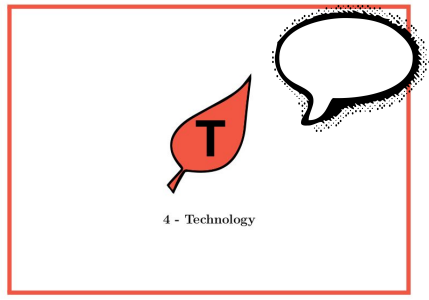
Remember:

- What is your privacy problem?
- What game have you selected?
- How does these changes increase awareness of your privacy problem?

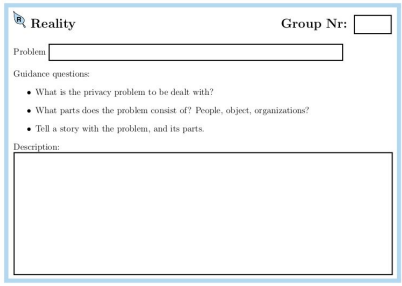
Meaning: increase awareness

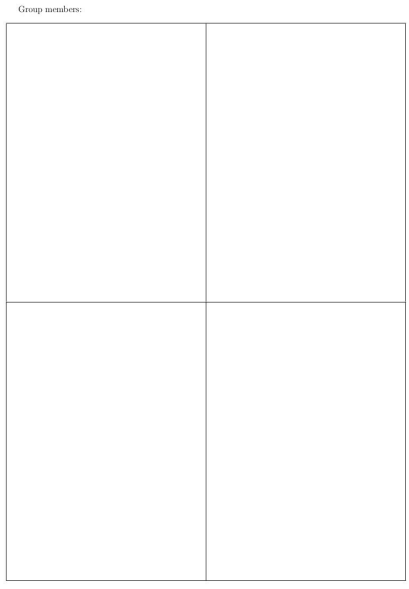


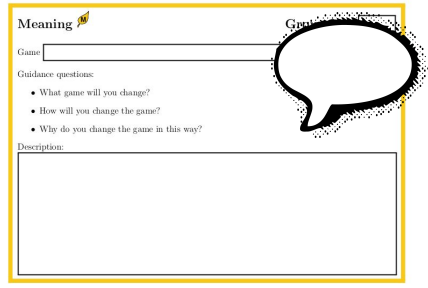


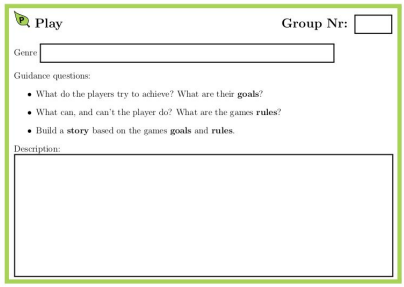


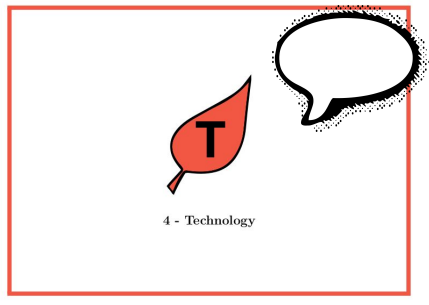
Play: create a game about your privacy problem



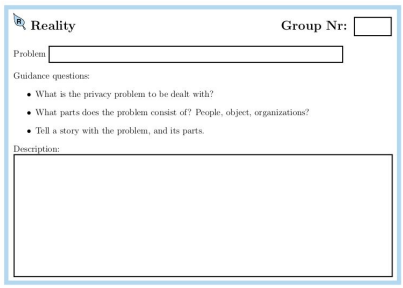


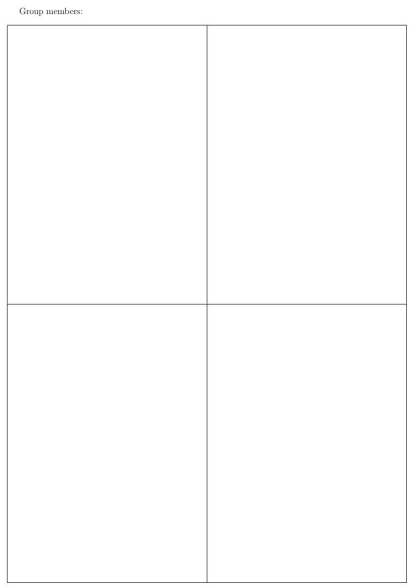


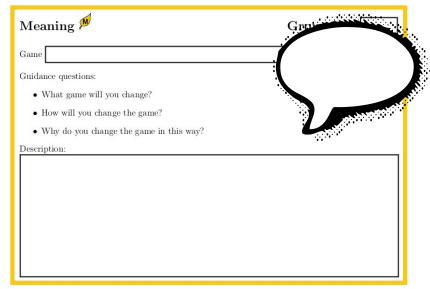


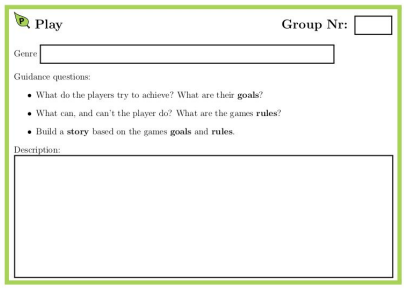


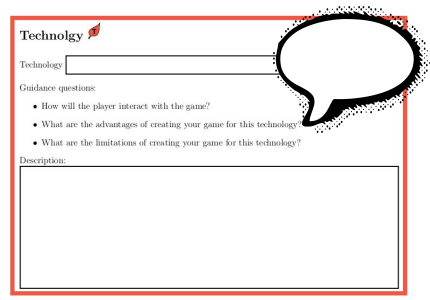
Technology: explain how your game is played











Presentation 5 min notice

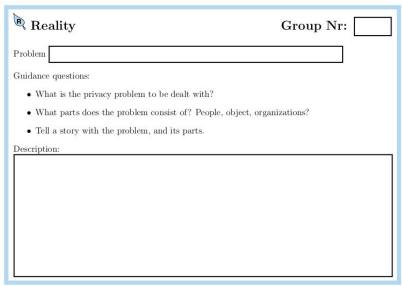
Remember:

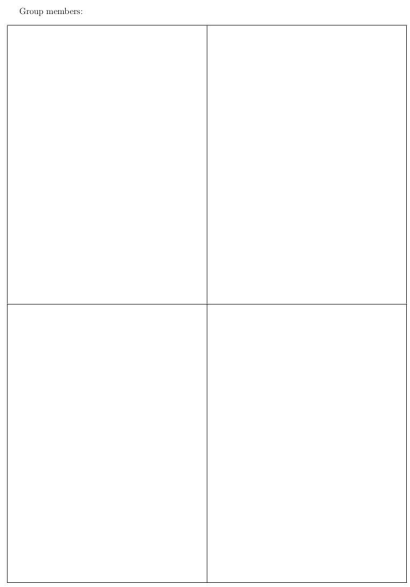
- What is your game idea?
- How is the game played?
- How does the game increase awareness of your privacy problem?

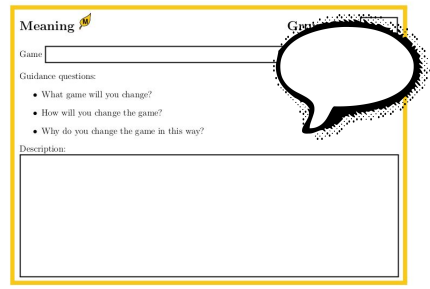
5 min til presentasjon

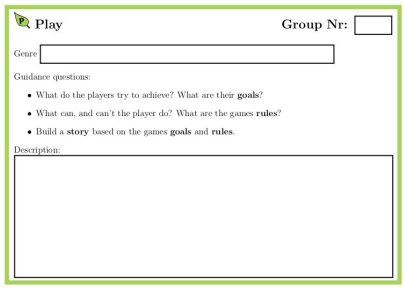
Tape sammen delene

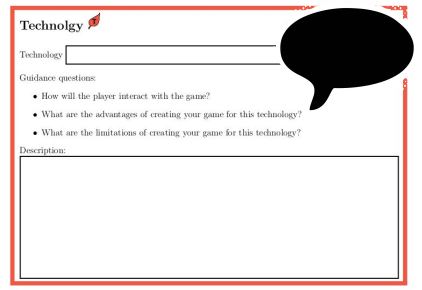
Technology: explain how your game is played











Appendix D

Kahooth! questions and result

Appendix Kahoot

Note: the questions and options was translated from Norwegian for this report. Bolded answers are the correct options.

Q2: Does Facebook know what phone you use?

	School A	Pilot 2
No	11	1
Yes, if I have a Facebook profile	8	2
Yes, if I have installed the app	17	3
Yes, If I have written about it in a status.	2	0

Q3: Does writing a Facebook status stating that Facebook can not use the information you provide for their own purposes mean anything?

	School A	Pilot 2
Yes, but only if I'm a lawyer	1	0
No, it is rubbish	28	6
Yes, because then my friends knows I care about privacy.	4	0
Yes, then Facebook are not allowed to use my information.	5	0

Q4: Which sentence does **not** describe privacy?

	School A	Pilot 2
Right to a private life	8	1
The right to decide about private data	1	1
Right to respect for own home and communication	12	3
The right to do digital actions without being surveilled	14	1

Q5: Do all apps have access to your location?

	School A	Pilot 2
Yes	4	2
No, they have to ask for access	32	4

Q6: Can snapchat sell your pictures and location?

	School A	Pilot 2
Yes, but they are responsible for that they are used responsibly	8	1
No, it goes against their privacy policy	12	2
Yes, And the buyers can use the data how they like	9	3
No, it is against Norwegian law	6	0

Q7: When can the school access your [school]email?

	School A	Pilot 2
Never	17	1
In suspicion of criminal offenses	14	2
Suspected of being used for harassment	4	1
When you receive your testimonial	1	2

Q8: Does Facebook know what (other) websites you visit?

	School A	Pilot 2
Yes, all websites on the internet	20	5
Yes, but only if they have a “share” button	13	1
No, it is against Norwegian Law	1	0
No, it is not possible	2	0

Q9: Is there anything about this image that should not be posted on social media?

https://batsmanbilder.wordpress.com/2012/09/26/kims-lek/
Picture of assorted items without any identifying information or normally considered private information.

	School A	Pilot 2
No, it is fine	25	5
Yes	5	1
Yes, it is dangerous to upload photos of your mobile phone	2	0
Yes, what kind of pen I use is very personal...	1	0

Q10: Is there anything about this image that should not be posted on social media?

survivorninja.com February 6 2015
http://www.survivorninja.com/learn-to-play-kims-game-to-increase-your-observational-skills/
collected 2017.11.19 16:48
Picture of assorted items including keys.

	School A	Pilot 2
No, it is fine	13	4
Yes, keys can be easily copied	20	2
Yes, the time can bee seen. It is sensitive information	0	0
Only on Instagram #f4f	2	0

Q11: Is there anything about this image that should not be posted on social media?

https://www.cnbc.com/2015/03/06/chinas-fosun-buys-5-stake-in-british-travel-group-thomas-cook.html
Picture of a family on holiday.

	School A	Pilot 2
No, it is fine, right?	16	3
Yes, it can make friends jealous	2	0
Yes, it contains information about where you are	3	0
Yes, it may let others know you are not at home	15	3

Q12: Are you completely anonymous on Jodel?

	School A	Pilot 2
Yes, I'm just @OJ	5	1
No, in suspicion of criminal acts, I'm am not	22	4
Jodel knows who I am	6	1
Yes, 100%	1	0