
Teen Evaluations of a Game Targeting School Refusal

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Abstract

Serious games can be a supplement to early intervention and treatment of school refusal. In this work-in-progress, we report on findings from an evaluation session in which teenagers gave detailed feedback on *Gnist* (English: Spark), a serious game for treatment of school refusal. Our contribution is an empirical review of the teenagers' opinions about the proposed game elements to overcome school refusal and their recommendations for future development as well as promoting school refusal on the design agenda.

Author Keywords

Human-centered design; Serious games; School refusal; Prototype; Evaluation; Work-in-progress.

CSS Concepts

• **Human-centered computing~Interaction design**); Empirical studies in interaction design

Introduction

A significant number of children suffer from *school refusal* (see side bar on next page). For these children school attendance is so emotionally distressing that it is highly problematic and often leads to prolonged absence [7]. Like other phenomena, school refusal is multifaceted with different causes, effects, and treatments. A common factor is that the children have a considerably hard time going to or attending school while the parents are well aware of the problem. School refusal is painful and despairing for the affected children and their families, with potential serious consequences such as hampered psychological, social

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School refusal

Defined as “difficulty attending school associated with emotional distress, especially anxiety and depression” ([7] p. 197).

School refusal is a school attendance problem following these criteria [4]:

- a) children’s reluctance or refusal to attend school which commonly leads to lasting absence;
- b) the child is often at home instead of being at school and the parents are fully aware of this;
- c) the child experiences emotional distress related to school attendance;
- d) there is absence of distinct antisocial behavior and
- e) parents have tried to ensure the child’s school attendance.

Criteria b), c), and d) distinguish school refusal from truancy which relates to anti-school sentiments and antisocial characteristics like finding school boring and seeking more gratifying activities outside school [2]. Criterion e) distinguishes school refusal from school withdrawal [4].

Not classified as a disorder but can be associated with various diagnoses within the anxiety spectrum and behavioral disorders [8].

and academic development on the child’s side [1] and on the family’s side difficulties of both legal and financial character, lost working hours and internal conflicts as well as parent-school conflicts [5]. Typical consequences on the longer term also affect society at large and include school dropout, delinquency, limited opportunities in the labor market, substance use, economic deprivation and psychiatric disorders [5, 6].

For the last two years we, a team of designers, researchers and an entrepreneur, together with various groups of children and adults being experts by experience or profession, have been designing a serious game called *Gnist* aimed to engage children aged 10-13 years who are at risk or in early phase of developing school refusal. Early identification of children who are at risk of school refusal is important for the outcome of the prevention or management [11]. *Gnist* seeks to (1) increase school attendance, (2) reduce anxiety, and (3) support psychological healthcare services in their assessment process. We have used a human-centered design approach to help children organize and solve their daily tasks in a more motivating and fun way and as such provide support to reduce anxiety. The idea is that children, relatives and frontline professionals in education, health, and social care can work together, with the help of a mobile game as a tool, to identify and treat mental health problems that relate to children’s school refusal. The app is still under development. Currently we have an early clickable prototype that has been evaluated by 21 students in a school class at a secondary school.

In this paper we propose serious games as a suitable supplementary tool for treatment and interventions and describe how *Gnist* can benefit children and their families by virtue of being a serious game. We report on findings from a teen evaluation session providing early feedback on the *Gnist* prototype and discuss possible implications.

GNIST: A Serious Game Targeting School Refusal

We understand serious games to be games created to fulfill a serious purpose beyond their independent aims – thus, entertainment is not their principal goal [8]. We base our serious games approach on three core insights: (1) Game mechanisms that rewards physical activity can increase a sense of well-being and can be used as a form of exposure therapy [12]. (2) People trust chatbots with their personal information [11]. (3) External motivation is key to prevent social isolation. Children with school refusal are in danger of being socially isolated.

Below we use the Serious Game Design Assessment Framework (SGDA) [8] for analyzing and justifying formal conceptual design choices of *Gnist*:

1. Purpose: *Gnist* is a game about solving everyday tasks. The purpose is to (1) increase school attendance; (2) reduce anxiety; and (3) support professionals in mapping challenges and problems. Our approach is to offer a magical universe wherein everyday activities can be framed in a playful manner. A friendly monster is ready to accompany the child throughout the entire day (Fig. 1a) by breaking up the day (before school, go to school, at school, go home), encouraging rating of perceived difficulty of daily activities and gamify them (Fig. 1b) through collecting magical berries (Fig. 1c). *Gnist* also offers messaging between the child and close friends or caregivers to enable sharing of encouraging words.

2. Content and information: *Gnist* offers and makes use of identification of daily activities (inside and outside school), in-game data on the players’ perceived level of difficulty connected to activities, identification of home-school route, an overview of accomplishments related to set goals (number of days at school and number of collected berries), messages, and an overview of weekly progress shown as list or graph.



Figure 1. a) Three friendly monsters; b) gamify everyday activities; c) collecting magical berries to feed the monster.

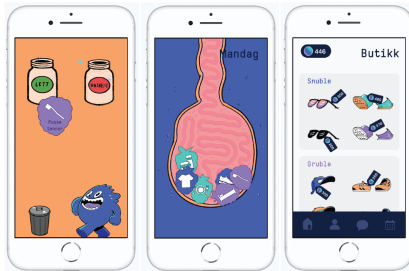


Figure 2. a) Rating difficulty in morning routines; b) Digested berries; c) the in-game accessory store.

Content and information are conveyed in a friendly and non-judgmental tone of voice.

3. Game mechanics: *Gnist* invites the player to awaken the monster, get challenged by the monster to carry out activities by competing on time or otherwise, collect as many magical berries as possible as activities unfold, feed the monster with magical berries so it can grow and develop, review the day (“pretty crappy”, “alright”, “sparkly”) and redeem the earned points in the in-game store (Fig. 2c) to buy monster accessories. Caregivers and children can also make agreements about other rewards.

4. Fiction and narrative: To enter the universe, the player is asked to set up a profile by choosing one of three monsters *Stumble*, *Clutter* and *Ponder*. The message behind these is that no one is flawless and to depict imperfection as something enchanting and embraceable. The chosen monster guides the player in identifying daily activities before going to school and rating the perceived difficulties in performing them – for example “brushing teeth”, “getting dressed”, “eating breakfast” (Fig. 2a). The activities correspond to magical berries. The monster also wants to learn about the player’s school subjects like “math” and “gym” (Fig. 2b) and less structured school activities or transition moments like “speaking aloud in class” and “talking to the teacher”. Next, the monster asks the player to set up the route from home to school in a map. To start *Gnist*, the player awakens the monster who is cheerful and ready to get a good start to the day. The story is linear, following the structure before school, go to school, at school, go home. Throughout the day the game offers opportunities to feed the monster with magical berries, keeping it healthy and happy. These opportunities are linked to daily activities that will be perceived as more or less challenging depending on the player’s capabilities and struggles. The plot includes small conversations between the monster and the

player. The game will also enable family/therapist to send encouraging messages.

5. Aesthetics and graphics: *Gnist* offers a 2D universe centered around the brightly colored cartoon monsters, magical berries with simple flat icons, and sparklers. The monster makes characteristic sounds and develops as it is fed. The audiovisual language takes a cheerful and humorous tone. To reach a broad group of children the game has a limited amount of text, which is framed in speech bubbles and supported by audio.

6. Framing: *Gnist* seeks to address children aged 10-13 years who are at risk or in early phase of developing school refusal. The challenge of the game lies in performing activities that children acknowledge to struggle with and finding pleasure in overcoming struggles in a playful and gamified frame. The anticipated lifetime of the game for a child will span from a few days until a few months. The children can take the time they need to establish new habits and routines in order to solve everyday tasks. Breaking up the day into many small parts allows for recognizing and celebrating progress no matter how minor it may seem. The goals are set by the players together with an adult (parents, therapist) and the game will make itself available according to the pace of the player.

Method: Evaluation Session

Following a human-centered design process we are particularly concerned with end-user involvement. However, given that the topic is sensitive, the process of recruiting children who have established school refusal is ethically comprehensive and time consuming. Pending this process, we were interested to get feedback from a broader group of children for assessing the game concept. We contacted a number of elementary schools with request to conduct testing with children aged 10-13. However, we got many rejections because of tight programs at the schools or lack of

Evaluation session

Participants: 21 students (8 girls and 13 boys) in a 9th grade school class at a secondary school (13-14 years) in Norway. Each student was coupled with an adult from the team.

Context: Secondary school, private meeting rooms. Fruit and cookies offered.

Evaluation length: 10 to 30 minutes, depending on the students' engagement.

Evaluators: Four of the authors participated in conducting the evaluation.

Equipment: Smartphones with *Gnist* installed

Method: Observations of students playing game using think aloud protocol followed by open-ended questions

Data collection: Answers registered by hand in separate booklets for each student.

Research ethics: Teacher informed children and their parents 10 days before our visit and was careful to make sure that they had the opportunity to say no to participation. Upon our visit we repeated the provided information to the whole class and explicitly stated that participation in the session was voluntarily.

resources. Eventually we were contacted by teacher of a 9th grade school class (14-15 years). The teacher had experience with school refusal and considered serious games to be a promising tool. Even though these students were older than the intended target group we regarded their evaluations and input highly valuable. Listening to and involving children and their peers is a core idea in childhood studies [12]. In our case, the teenagers can be seen as peers holding first-hand experiences with the current school system and being students. Enabling peers to act as consultants on the topic at hand is a renowned method in participatory studies [12].

The study was conducted in a secondary school using an evaluation session where students tried *Gnist* and reported their opinions about it, some details about the setup are provided in the side bar. When presenting the purpose of the evaluation, we clearly expressed that we were not looking for the students' personal experiences, but rather wanted help with assessing the game concept. We emphasized the value of obtaining feedback from their perspective as teenagers. We suggested they could imagine having a friend or younger sibling who somehow struggled to attend school and evaluate the game with this person in mind. The students were asked to play through the main parts of the game. We used a pre-filled task booklet to ensure guidance of a logical order throughout the game and related questions. Questions were formulated openly, like "What do you think about this part of the app?" and "Was there anything you liked particularly well about this part?". All the answers were collected, discussed and reviewed as a collaborative effort among the authors.

Findings

For each category, corresponding quotes from the participants are presented in the side bar.

First Impressions: The teens generally gave positive feedback on the first impression of *Gnist*. The flow of the game was considered and rated as good. They generally understood what to do and pointed out that the game seems orderly. Many considered the questions posed in the game as an appropriate choice. It was pointed out that it was good to ask different questions, that it was cool with an app where you can answer different things about the school and that the questions were suitable. Furthermore, it was good that the game adapts to the player based on how questions are answered.

The game characters: With their different personalities, they were considered easy to like and described as cool, funny, weird and cute. Humor was considered important for gaining players' confidence.

Sorting activities: It was pointed out that sorting gives the players an opportunity to say what they think about things and that they can be honest. Several stated that they liked being able to sort things in a simple way. Some suggested an extra category or more alternatives between "easy" and "difficult".

Before school: The teens liked that the game provided an overview of routines and that gaming their way through them released points.

Going to school: The teens enjoyed this part of the game and seem confident that it can motivate children. It is considered essential however to increase the number of berries along the way and that a clear development of the character occurs as it is fed.

At school: The teens were positive to self-reporting and many pointed out that it provided an opportunity to lighten one's heart. The statements in the side box suggest that young people think it may be easier to tell an app about own experiences in their everyday lives than directly to friends or adults.

First impressions of GNIST

"Seems very appropriate for people who are struggling, that they can put more words on what is difficult, often it is a bit like "can't go to school" and "don't quite know why"."

The Game Characters

"It is more comfortable to respond when the character has a little humor than if the characters had been too serious."

Sorting of Activities:

"Felt good sorting the different things."

Before School:

"Liked that you could see what you have already done and what lies ahead."

"Especially liked that you earn points for the things you do."

Going to school

"Good with points, gives such a boost, that you want to achieve something. For each day for example, surprises in the form of new design on berries. Something to look forward to, work towards, gets motivated by collecting things."

"Think it would have been motivating with rewards along the way."

At school

"Easier way to get your thoughts out of the head and to express oneself."

"Not all parents ask what it is like at school, so it's really nice that an app does just that."

"Could also ask what went well in the subject and what went bad?"

Going home: This was considered a less important part of the game because the player is already finished with the school day.

Reviewing the day: It was considered positive to see what one had achieved throughout a day and to get the whole day summarized. The gut of the monster visualizes all the tasks that have been solved. The teens reflected on the significance of this part by envisioning the player having a bad day. The store stands out as cool and potentially interesting.

Progress: For the teens it made sense to see how the player had performed over time. Most thought that the overview gave a positive motivation if the player experienced improvement. However, if a player did not manage to improve, the participants were worried that the game could reinforce the feeling of defeat.

Messages: Most were positive to an integrated message account for receiving messages from their close ones. It was associated with motivation, promotion of self-confidence and experiencing encouragement and belonging. However, some thought that such messages could contribute to experiencing increased pressure to come to school which could also be a negative outcome. It was also mentioned that students could feel the urge to lie to parents as a response to encouraging messages, to pretend to be doing better than is actually the case.

Overall impressions: The teens generally gave a positive review of the overall idea behind *Gnist* and expressed confidence in the concept as a whole. Reviewing the day, the reward system, gaming morning routines, the animations, the characters, messages from the monster and close ones are all mentioned as examples of what the teens liked about *Gnist*. Concerning feedback about what they missed or would have prioritized next, further work on gaming the school way and upgrading the store was highlighted.

Some wanted more obstacles and elements to make the school way more exciting and others would like more things to buy for the characters such as clothes, various hairstyles and animals.

Concluding Remarks and Further Work

This work-in-progress has given insight into how a group of teenagers are viewing *Gnist* as a serious game designed to help children at risk or in early phase of developing school refusal. The overall purpose of *Gnist* is three-fold: (1) increase school attendance, (2) reduce anxiety, and (3) support professionals in mapping challenges and problems connected to the school refusal. The teens' feedback was largely directed towards the two first. One limitation with this work-in-progress is that the participants were not recruited based on having experience with professional treatment themselves – we asked them to respond from an imagined viewpoint as a thoughtful friend. That said, many of the youths, through their statements and examples, showed that they were often able to relate their feedback to the school refusal issue. Here, a significant number of the teens mentioned that the approach of separating each daily activity, interacting with an encouraging character, collecting berries and points, receiving messages and getting a visual overview could probably help children to get to school, get more things done and share thoughts and reflections on the day – in other words, moving towards altered behaviors, feelings and mindsets.

Research suggests that young people may prefer to interact with a bot or in a chat when communicating about own mental issues [11]. This was supported by the teens in our study. Given that many of the existing therapies are based on a collaboration between children and close adults (parents, teachers, therapist) in combination with training, the game can serve as a supplement both as a link between the various actors and by offering the child more control within the

Reviewing the day

"If you feel you have had a bad day you can look at the summary and realize that you actually have completed some things."

"Positive with the comments from the characters, that he says "will do better tomorrow" is motivating."

"Very good with a shop. It was very cool, think it is motivating."

Progress

"It makes it easier to explain how things went, because you can't remember everything."

"Think it could have worked well with a progress page. If you have many good days, you will want more. Not sure how you would react if you had many bad ones."

"Nice comparison - shows very easily how the days have been in relation to each other. Benefits? She sees how she improves and feels every day."

Messages

"My friend would have been happy, encouraged, accomplished a little more during the day."

"Enjoyed the message page. Knowing that someone loves you. It makes you proud. «You are good the way you are»."

Overall impressions

"Seems very useful for people who are struggling to get to school. (...) I like the concept of the app a lot - that is, you get help to go to school if you have problems."

(...) first make sure to get it out there because there are many who need this app."

treatment process. In the long term it can contribute to increased school attendance and reduced anxiety.

Based on the teen evaluations of *Gnist* and the analytical review of serious game elements it seems promising that our game can contribute to help children at risk or in early phase of developing school refusal. Further work will involve children who are struggling with school refusal, as well as their parents, teachers, and potential therapists so that they can contribute to development of *Gnist* with first-hand experiences. Our ambition is to help children early and support increased management of the treatment process by providing them with their own tools readily available in their pockets - as emphasized by one of the participating teens: "There are many who need this app."

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