

Utilizing Outdoor Quiz Games in Secondary School: Teachers' Perceptions of Usefulness

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Abstract: Outdoor play is a natural way for children of all ages to do physical activity. The advantages of being outdoor in an educational setting have been elaborated. For instance, the social constellations may change when outdoors as the social structures defined in the classroom setting no longer apply as the pupils may display different skillsets outdoors as to indoors. Using games for learning purposes have been employed for several decades. As far back as in 1904, the Landlord's Game was used to teach people about real estate and taxation. Since then games have mostly been developed for leisure purposes, but some also for educational purposes. In this paper, we elaborate on the use of a Norwegian developed quiz game called 'ZippyGO'. Most of the research on ZippyGO have been focusing on students' perceptions of the use of this quiz game. In this paper, however, we focus on the teachers' perceptions and use of an outdoor quiz game for educational purposes. In this particular case, four teachers have collaborated on developing questions for the quizzing. We conducted mixed method ways of collecting data, surveys and semi-structured interviews. Our investigations have focused mainly on how the teachers perceive working on developing adequate questions for the quiz and how they perceive pupils may react to using the quiz game. We have also challenged the teachers on their perceptions of games for learning purposes in general and about being outdoor during class.

Keywords: Educational game, Outdoor gaming, Quiz game, Teachers' perceptions

1. Introduction

The potential of learning from games have been explored for decades (Gee, 2007; Pivec and Kearney, 2007). There have been games for several different areas and disciplines such as history (Squire, 2005; Zin and Yue, 2009; McCall, 2016) and languages (Hubbard, 1991; Godwin-Jones, 2014; Klimova and Kacet, 2017). Games have even been taught to train for warfare (Vold and McCallum, 2009).

Generally, games have been developed and then put to use in, for example, a classroom. Some have been developed especially for bespoke purposes (such as games for warfare (Vold and McCallum, 2009)) or it has been commercial off the shelf (COTS) games, such as for example Sid Meyers Civilization games (Watson, Mong and Harris, 2011).

In this paper, we are presenting a game originally developed as an orienteering games-based application (app) with added functionality. The game is thus played outdoors.

1.1 The Game ZippyGO

The game ZippyGO is a downloadable app that works on both the android and IOS platforms. The app is developed by Ida Vår Kierulf Meyer at Konkylie Data As, Norway (www.konkylidata.no). When downloading the app, you will get access to the "routes" made available to you. The app can either be used as a geo-referenced map with *controls*, or it can be used as a quiz-game. If it is used as a quiz-game, the quiz will appear on the screen of the device when being within a certain range of the geo-referenced point (*control*) marked on the map. The app will then allow you to answer the quiz right away or save it for later. The answers and e-mail address are saved on a safe server in Norway. When the period of the game is over, the data are erased.

The app is set up to allow, for example, teachers (or others) to develop a quiz-game with geo-referenced points. In this particular study, one of the researchers has access to developing a quiz-game and invited the teachers to come up with questions and answers for the quizzes. The questions were sent to the researcher and the researcher then added the quizzes to the quiz-game. Playing the quiz-game was part of the programme for an outdoor day during the pupils' semester. During the outdoor day the teachers are to do activities together with the pupils and during this particular day late in the spring semester, one of the planned activities was for the pupils to play ZippyGo.

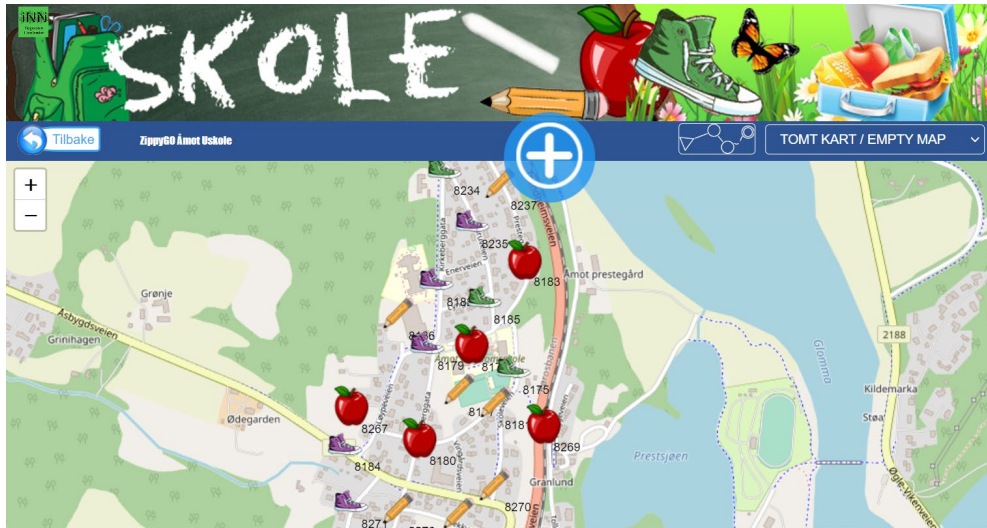


Figure 1: Screenshot of the admin website of ZippyGO showing the map of the area

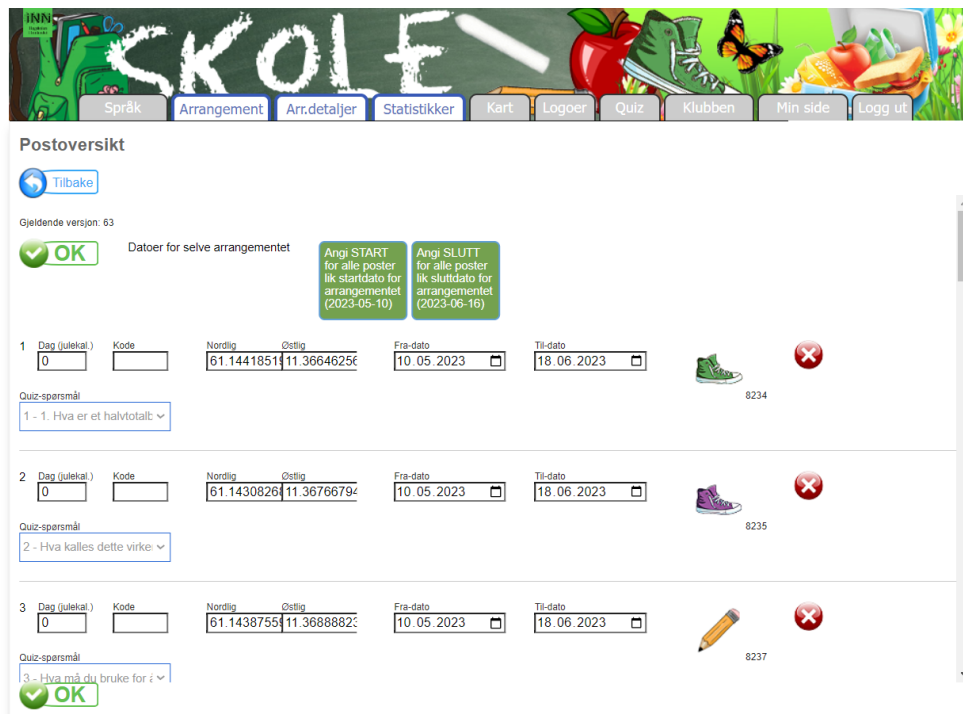


Figure 2: Screenshot from the admin website where the quizzes are added

The teachers' involvement was important in order to secure that the quiz-questions were within the scope of their learning objectives. The teachers of the different subject would have the best overview of the different subjects and their curriculum could thus focus the questions and answers within the frames of what they had been teaching. Since, this was a day for all of pupils on this particular level (level 9), we asked the teachers to collaborate and cooperate on developing the questions for the quizzing as we would also like to see if they could find any common use of the quiz-game after this study.

The pupils who were to utilize the game were pupils at the Åmot secondary school in the municipality of Åmot in the Inland County, Norway. The pupils are at level 9 in the Norwegian system (approximately between 14 and 15 years of age).

To each *control* (the geo-referenced point in the map), a quiz was assigned. The quizzes were developed by the teachers that volunteered for the project which taught the following topics: Norwegian (language), Science, Maths, English (foreign language) and Social Science. An example of a Science question for the quiz was: "what is the energy source called that comes from the centre of the earth? A: a) Geothermic energy, b) Bio-energy, c)

Solar energy (the correct answer was a) Geothermic energy)”. The pupils were to solve the quizzes in groups of 3 to 5. Since this paper is focused on the role and perceptions of the teachers, our research question is:

What influences teachers’ perception of the usefulness of an outdoor quiz-game (ZippyGO)?

In the following we will present the literature that has enlightened our study, the method of inquiry and present the results from our data collection before we conclude and suggest further research.

2. Theoretical Foundation

We assume that in their training for becoming teachers, they touch upon themes as outdoor learning, and how pupils can learn with and from each other, and how competition and games may contribute towards pupils’ learning. We have also investigated how they perceived to develop the questions for the quizzes and sought theory from organizational learning theory.

2.1 Outdoor Learning

Outdoor learning has proved to be beneficial regarding social relations in the class (Jordet, 2010). And although longer outdoor arrangements are more effective regarding behavioural issues, being outdoor still has an impact (Dillon, Rickinson and Teamey, 2016). This is the secondary school and according to Ballantyne and Packer (2002) these students enjoy exploring the surroundings and have new experiences. Outdoor learning activities should, however, be planned and the students should be prepared in order to get the most out of the experience (Dillon, Rickinson and Teamey, 2016).

According to Lai (1999), students should be allowed to explore on their own rather than having a teacher controlling them. Areas where children feel relaxed offer the feeling of freedom, these are the environment that support conversations (Fisher, 2013).

2.2 Learning From Groupwork

Social learning theory supports the idea of learning with and from peers (Vygotskij, 1978). Coordination and cooperation are significant in small groups as it gives them the ability to function well (Rapanta, 2023).

Moreover, small groups allow pupils to take part in other pupils’ knowledge, skills and experiences (Terwel, 2003). They may also be able to verbalize what they think, for example to be the right answer, without having to wait too long to be heard (Terwel, 2003; Fisher, 2013). The immediate response is something pupils sometimes need, in order to stay focused and alert. In a classroom with up to 30-40 students it is not acceptable behaviour to demand to be heard (Fisher, 2013). Pupils in a classroom are encouraged to wait until it is their turn, but sometimes their attention span is not sufficient for this wait.

Planning for a group task should then involve presenting a common purpose, so that they “share, discuss, argue, rationalize, find solutions and come to decisions together, just as they did in their earlier years when playing together was a more fluid and spontaneous affair” (Fisher, 2013, p. 132).

As children develop in different pace and ways, fixing groups for collaborative learning may not be optimal (Fisher, 2013). When children are allowed to organize the groups themselves, trust and security are two major keywords (Fisher, 2013, p. 135).

2.3 Quizzing for Learning

Quizzing is a way of gaming and games have been used for learning purposes for several decades (Hubbard, 1991; Salen, 2004; Stobbart and Evans, 2014; Slyman, 2018). Games are engaging, offer competition and may be immersive.

Yang et al. (2021) call quizzing “testing” and “test-enhanced learning”. Testing facilitates for several learning advantages and is not only “an assessment of learning, but also an assessment for learning”(Yang *et al.*, 2021). Longitudinal research at the Inland Norway University of Applied Sciences, Norway, where another (indoor) quiz-game have been used, the students claimed it to support their learning outcome from courses (Haave and Vold, 2018). Research conducted with adult students showed that quizzing is perceived as motivating as it provides a competitive and fun approach to learning (Haave and Vold, 2018). In this study, the students from the “Research Methods” course cooperated together and developed some questions for the quizzing game. An example of a question is : “Which of these data collection methods are qualitative? A) Survey, b) e-mail interview, c) personal interview, d) collecting statistics”. The class was divided into groups and each group developed some questions each from a designated chapter in the textbook from the curriculum of the Research Methods course. This was

very well perceived, both developing the questions and doing the quizzing, and they claimed to have learned both from developing the questions and from the quizzing itself.

2.4 Inclusion and Engagement in Development

In the same study as presented above, the students were engaged in developing the quizzes, something they also claimed to be enhancing the learning outcome, but also being engaged 'involvement and inclusion' (Vold *et al.*, 2018). The teachers are encouraged to contribute towards the quiz game by providing their own quizzes from the curriculum they have been teaching. In our case study, it is about seeking to engage the teachers by involving them in the development of the quizzes. Involvement and inclusion are also a part of the theory of Learning Organizations (Lave and Wenger, 1991; Senge, 2006; Filstad, 2007, 2016) and about developing organizations (Jacobsen and Thorsvik, 2019). As this can be compared to a development of a (small) part of their work, it is worth looking at this theory. Senge (2006) for instance, claim that team learning and personal mastery will aid in a development process. Lave and Wenger (1991) discuss how Communities of Practice (CoP) due may aid in solving problems. The team of colleagues may be the CoP they need to learn and to feel personal mastery, to have shared visions and to have shared mental models (Senge, 2006).

3. Methodology

We have treated this as a case study as it was tested out as a single case (Yin, 2014). We used mixed methods of collecting data, surveys (Dwyer and Slyman, 2016) and in-depth semi-structured interviews (Dalen, 2011; Jacobsen, 2015; Johannessen, Christoffersen and Tufte, 2020). We use an adaptive method to analyse the qualitative data from both surveys and the interviews. We studied data line-by-line, sentence-by-sentence using colour coding highlighting key themes within each section. We looked for hidden meaning & actions. Asking questions, engaging/interacting with data, such as *what influences teachers' perception of the usefulness of the game (ZippyGo)*, why participants are expressing their views/experiences the way they did. We reflected on each data and examined it, pondering and re-inspecting it. These then accumulated to categories that made up our findings. At this stage, all the coded data were linked back to the literature.

This mixed methods approach (Creswell and Creswell, 2017) has provided us with valuable insights into what teachers' reasons were behind using an outdoor quiz-game and how their perception behind developing quizzes from their own curriculum.

4. Findings

The findings from the survey are based on teachers' responses where we inquired about how they perceived developing the quizzes (and answers) and how they perceived using the outdoor quiz-game for their students. The answers were somewhat inconclusive as the respondents have very different opinions about quizzing usages. It ranges from very positive towards using out-door games, to less positive. The reasons given for the positive are that it represents something new, it allows pupils to work in groups outside and activates their braincell to engage further in learning.

Statements like "The pupils were excited about doing something we don't usually do, and they really like being outside"(Interviewee 1) and "I could tell that the pupils enjoyed the quizzing and that they had fun. The groups were discussing and laughing but seemed eager to beat the other teams" (Interviewee 2). This is supported by the theory on group learning (Lave and Wenger, 1991) and team learning amongst pupils.

On the negative side, it is mainly about the area the quiz-game is played as some of the controls were outside the physical area of the school. They expressed a lack of control of the whereabouts of the pupils when they exited the school area.

When it comes to learning, teachers' responses are again split. Two claims that learning in team is a good thing and being outdoor is also great for pupils as they may then learn in a different environment. This is supported by Jordet (2010) and Coates and Pimlott-Wilson (2019) who state that pupils may act differently in different environment and that social constellations may also change. On the other side, two of the teachers respond negatively when they heard about malfunctions in the app, something which may happen and which can obstruct learning, if the students can't be trusted to do the quizzing, or if the weather does not permit being outside. This is what Filstad (2007) calls lack of control of external elements and a reluctance to test novel ideas. These comments are to do about situations and issues beyond anyone's control. However, they do not question the play, fun and engagement regarding the game. Hence, they do not disclose any lack of a potential regarding learning outcome for the pupils when playing the quiz (Mayer, 2014).

When it comes to developing questions for the quizzing, most of the teachers picked questions from the curriculum being lectured the past few months. One teacher even made up a “trick-questions” and focused on having fun. A few teachers were enthusiastic about making questions for the quizzing, but some also found it hard to do extra work. In the open-ended questionnaire one of the respondents refer to it as “yet another thing we need to do on top of everything else” (Respondent 1).

Only two of the four teachers worked together when developing questions for the quizzing. The other teachers did not collaborate nor cooperate, and in the interviews, we were told that the time aspect was the reason for not cooperating. “We all had classes and the little time we had of common time was spent on more urgent matters” (Interviewee 2). This implies that working on developing the quizzes was not prioritized. Hence, there was no opportunities to working on this together.

While most of the teachers claim they will use it again, one is uncertain. The ones who wish to use it are positive towards the potential of the quiz-game and claim to wanting to take part in future projects. The one who is hesitant, is the same who expressed being reserved about letting the pupils move outside the school area.

Unfortunately, as there was little or no cooperation and collaboration between the teachers, we were unable to establish any development between the teachers as a result of developing the questions for the quizzing.

5. Conclusion

The study was to investigate teachers’ perceptions behind using an outdoor quiz-game, how they perceived developing quizzes from their curriculum and how they perceived cooperating and collaborating to develop the quizzes. The teachers have very different approaches to using the quiz-game. The positive teachers are willing to test new and novel experiences and also believe that outdoor is a good environment for pupils’ learning and development. The negative ones seem to problematise on what may go wrong, which are issues beyond their control. However, none of the respondents were negative towards the potential learning outcomes from the gameplay nor from using the quiz-game. Only two of the teachers worked together and developed questions for the quizzes. The others did not collaborate, hence, it was not possible to investigate if and how the collaboration would develop their work situation.

5.1 Further Research

The next project is already planned and will be a case study with a quiz-game that the teachers will have contributed towards both in North-Macedonia and in Norway. Included in this project, our next endeavour will be to follow up on this investigation further.

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