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The multivoicedness of game play: Exploring the unfolding of a student's learning trajectory in a gaming context at school

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Abstract The purpose of this article is to gain knowledge about how interactions in a gaming context become constituted as effective resources for a student's learning trajectory. In addition, this detailed study of a learning trajectory documents how a computer game becomes a learning resource for working on a specific topic in school. The article reports on a qualitative study of multi-ethnic students at an upper secondary school who have played the computer game *Global Conflicts: Palestine* to learn about the complexity of the Israeli-Palestinian conflict. A sociocultural and dialogic approach to learning and meaning-making is employed as an analytical framework. Analyzing different interactional episodes, in which important orientations and reorientations are located, documents how the student's learning trajectory developed and changed during the project. When engaged in game play in educational settings, experiences with playing computer games outside of school can relevantly be invoked and become part of the collaborative project of finding out how to play the game. However, these ways of engaging with a computer game might not necessarily facilitate a subtle understanding of the specific topic that is addressed in the game. The findings suggest that the constitution of a computer game as a learning resource is a collaborative project, in which multiple resources for meaning-making are in play, and for which the teacher has an important role in facilitating student's adoption of a multiperspective on the conflict. Furthermore, the findings shed light on what characterizes student-teacher interactions that contribute to a subtle understanding, and offer a framework for important issues upon which to reflect in game-based learning (GBL).

Keywords Classroom interaction · Computer games · Dialogic · Game-based learning · Learning resources · Learning trajectory · Student-teacher interaction · Voice

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Introduction

In recent years, computer games have been characterized as powerful learning tools (Collins and Halverson 2010; de Freitas 2006; Gredler 1996). However, empirical research on the use of games in classrooms reports divergent findings (Egenfeldt-Nielsen 2006; Squire 2005). Particularly, there is a lack of detailed studies of computer game use *in situ* that might enable an unpacking of the various factors that together constitute the affordances and constraints of game-based learning (GBL).

This article reports on a qualitative study of a multi-ethnic class at an upper secondary school in Norway in which students have played the computer game *Global Conflicts: Palestine* (*GC: P*) to learn about the Israeli-Palestinian conflict. In this game, students assume the role of a journalist hired to cover different aspects of the conflict. The goal is that, through assuming the role of a news reporter, students will encounter and investigate a variety of stories told by different characters, and thereby gain insights into the complexity of the conflict.

This article describes a detailed case study of how interactions in a gaming context become constituted as effective resources for a student's learning trajectory, something that is made possible by his collaborative interactions with his peers and the expert guidance of their teacher. Analysing this particular student's learning trajectory, from a dialogic approach to learning and meaning-making (Dreier 2003; Linell 1998, 2009; Wegerif 2006, 2007), makes visible how these interactions contribute to the adoption of a multiperspective on the conflict. Furthermore, analyzing how this student interacts with other people and cultural resources located inside and outside the classroom, enables a detailed account of how a computer game becomes a learning resource for working on a specific topic in school. The findings illuminate the complex process of constituting a computer game as a learning resource in the classroom, and offer a framework for important issues upon which to reflect in GBL.

First, this article briefly reviews the field of research on educational use of computer games. Second, the sociocultural and dialogic approach is outlined. Third, contextual information is provided, followed by methodological considerations. After analyzing the student's learning trajectory, the findings are discussed and implications for research on GBL are outlined.

Research on computer games in educational settings

In research on GBL, computer games have been regarded as tools having great potential for learning purposes (de Freitas 2006; Gredler 1996; Gros 2007). Scholars have suggested that GBL can motivate students (Prensky 2001), simulate real-life situations (Shaffer 2006), or simply inspire new design principles for learning in schools (Gee 2003). However, disagreements regarding how games can be employed in educational settings abound, and several propositions have been advanced. For instance, de Freitas and Oliver (2006) have proposed a framework for instructors to evaluate the educational benefits of games and simulations, stressing issues like context, learner specification, pedagogical considerations, and the tools used. In the context of civic learning, Raphael et al. (2010) have emphasized that a connection between game play and content, individual actions and social structures, and ethical and expedient reasoning has to be established to produce valuable outcomes.

Still, as Säljö (2010) and others have pointed out, there is a lack of evidence regarding how computers in general, including GBL, can contribute to better academic performance.

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Challenges in combining gaming activities with existing curricula have been reported (Egenfeldt-Nielsen 2006; Mitchell and Savill-Smith 2004), and the assumption that students will embrace this kind of activity in school is not self-evident (Hanghøj 2011; Sandford et al. 2006; Squire 2005).

The uptake of new technologies in existing practices is complex and time-consuming (Arnseth and Ludvigsen 2006). Small-scale projects, in which computer games are used for a small number of hours, are often deemed to fail since the pedagogy does not catch momentum. Squire and Barab (2004) have documented how playing *Civilization* was a complex process of both appropriation and resistance. When students saw the game as linked to their own interests, it became an object of appropriation; but when it was comprehended as an external agent, it was rejected. Furthermore, appropriation occurred late in the process, and required several hours of game play.

To facilitate GBL, the importance of the teacher has been emphasized, for instance, in regard to correcting misinterpretations in students' conceptions, and bringing together the different players' divergent experiences with the game (Egenfeldt-Nielsen et al. 2008). However, not many studies provide a detailed account of how student-teacher interactions function. Nash and Shaffer (2010) found that players of *Urban Science*, who were supported by mentors, developed professional ways of thinking in the field of urban planning. Even though findings suggest that development of autonomous professional ways of thinking is facilitated by the interaction between player and mentor, they do not provide any detail of the characteristics of their interaction and its effects.

In a quantitative study of a math game, Ke (2008) found that computer games improved math learning among students when they were part of collaborative activities. However, this study does not provide insights into how this collaboration unfolded during the hours of game play, and the different factors that contributed to success or failure. This study also stresses the importance of embedding gaming in meaningful learning environments, but does not provide a detailed account of what such environments should look like.

In line with Squire (2003) and Arnseth (2006), I argue that GBL is constituted as part of sociocultural practices. This means that the social and cultural context of the gaming situation, and the available resources for meaning-making, are just as important as the game itself. In contrast to the research reported above, studying game play in detail within a classroom enables scrutinizing how the affordances and constraints of GBL are constituted in interaction. By analyzing social interaction within a gaming context at school, I am able to document how such interactions contribute to the evolution of a student's learning trajectory, in which he adopts a multiperspective on the Israeli-Palestinian conflict.

Even though I focus on the learning trajectory of one student, this study does not lapse into an individualistic view on learning. On the contrary, this study documents how different interactional episodes contribute to the evolution of the learning trajectory and thereby document how learning and thinking is a collaborative accomplishment (Koschmann 1996; Stahl 2006; Suthers 2006). I will provide a rich description of how a computer game is constituted *in situ* as a learning resource in the classroom, how the teacher facilitates this process, and, in addition, develop a framework for issues to reflect upon regarding how GBL might be realized in schooled practices.

A sociocultural and dialogic approach to meaning-making and learning

From a sociocultural standpoint, learning is first and foremost understood as situated in a particular practice (Cole 1996; Lave and Wenger 1991; Rogoff 2003; Vygotsky 1978). In

order to study how people learn in a practice, it is necessary to study how people interact with other members and the different mediational means that are at their disposal for engagement in specific activities (Wertsch 1991, 1998). However, Dreier (1999, 2003) has introduced the concept of *learning trajectories to highlight how the person traverses within and between practices*. He stresses that learning is situated in a particular practice, but also that participation in one practice cannot be comprehended in isolation from other practices that a person traverses. However, learning trajectories are not unitary entities:

> Learning trajectories are full of interruptions; they are discontinuous. They involve finding ways to get back to them and pick them up again at other times and places and in ways agreed upon by other involved co-participants. If not, a learning trajectory may get lost altogether or the internal continuity of its pursuit may be weakened. Indeed, sometimes a learning trajectory is only remembered and picked up again because present occurrences make us draw a link to it anew. (Dreier 2003, p. 26)

Thus, the development and relevance of particular learning trajectories is constituted in social action. Furthermore, the concept of trajectories enables us to study how meaning-making unfolds chronologically along different time scales (Lemke 2000). When people learn in different practices, they follow different learning trajectories, but these trajectories can also intersect in specific ways (Ludvigsen et al. 2011). For instance, when learning about climate change in a science class, a trajectory involving personal experience with drastic weather change in the local environment can intersect with this learning trajectory.

This article connects to other studies that emphasize the interactional nature of meaning, and more specifically learning (Hellermann 2008; Martin and Sahlström 2010; Mondada and Doehler 2004). Within the CSCL research community, there has been great interest in dialogic perspectives on language, knowledge, and learning (see for example Arnseth and Ludvigsen 2006; Koschmann 1999; Ligorio and Ritella 2010; Wegerif 2006). I continue along these lines of thought, and employ a dialogic approach to meaning-making in order to study how learning trajectories unfold and intersect in the Israeli-Palestinian project. In this approach, *interaction* and *context* work as guiding principles in studying language, communication, and cognition (Linell 1998, 2009). From this perspective, meanings are interactional accomplishments. In analyzing meaning-making in interactions, an important analytical strategy is to study how utterances are responded to, and made relevant or irrelevant by the interlocutors. Treating the notion of context is a delicate matter (Goodwin and Duranti 1992). In this study context has to do with what frames the specific interactions that are being analyzed. However, as Ritva Engeström (1995) has pointed out, the object of talk in interactions often also refers to semantic content "outside" of the particular interactional situation. When different interlocutors encounter each other, resources from outside the situation also become an important part of meaning-making, something that is of analytical interest in this study.

In a dialogic approach, *voice* signifies a particular view of the world that comes to expression in a particular situation (Linell 2009; Wertsch 1991). Linell (2009) defines voice as "an expressed opinion, view or perspective, something that the person would typically say and presumably (at least at some level of intention) stand for" (p. 116). Voice offers an opportunity to study how different perspectives come together in meaning-making. According to Wegerif (2006), "meaning itself only arises when different perspectives are brought together in a way that allows them to "inter-animate" or "inter-illuminate" each other" (p. 146). Meaning is not found in one voice, one perspective, but rather in the way these multiple voices illuminate each other.

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The concept of voice enables me to document how different perspectives emerge during the Israeli-Palestinian project, and how these perspectives are managed by the students and their teacher. It also enables me to deal with questions concerning what becomes a resource when students are making meaning of the Israeli-Palestinian conflict, and from where these resources are recruited. By analyzing how the different voices are managed in interactions around the computer game, and in particular how the teacher orchestrates a learning situation in which the different voices are "inter-animating" each other, creating a "dialogic space" (Wegerif 2007), I will document how these interactions contribute to the evolution of a student's learning trajectory, in which he adopts a multiperspective on the Israeli-Palestinian conflict. The following two interrelated research questions will guide the analysis:

- How do classroom interactions contribute to a student's learning trajectory in a gaming context?
- How are games constituted as learning resources in classroom interactions?

Research design

Context

The project unfolded over 3 days, and was distributed over 4 weeks with 3 h for each session. It consisted of an introductory lecture, plenary discussions during the project period, watching documentaries on YouTube, and the actual game play. A fourth day was also set aside for a test, for which the major assignment was to write a news article, drawing on experiences gained during the project. The students were graded based on the test. The organization of the project period is displayed in Table 1.

The students were part of a vocational class that consisted of 12 male adolescents (16–17 years old) who were being trained to become car mechanics. Their classroom had a rectangular shape with posters of cars on the walls. Motoring issues were an important interest for the students. During game play, the students were organized in dyads, using laptops. The teacher, who is an experienced gamer, was the one initiating the gaming activity. When students were engaged in game play, he moved between the dyads, supporting them in different ways.

GC: P is a 3D computer game, in which the player is represented by an avatar (the journalist). It consists of several missions that address different aspects of the conflict, such as military raids, checkpoints, settlements, and so forth. When starting a mission, the player has to choose between writing for an Israeli, Palestinian, or European newspaper. As a

Table 1 Organization of the project period

	Day I	Day II	Day III	Day IV
Activity	Introductory lecture	Plenary discussion	Talk about the test	Final test
	Game play	Watch a documentary	Plenary discussion	
		Game play	Watch a documentary	
			Game play	
			Plenary discussion	
Duration	3 h	3 h	3 h	2 h

journalist, the player has to look up different non-playing characters (NPCs) who tell different stories, and collect quotes from them. When talking to an NPC in *GC: P*, the conversation is carried out by choosing from a list of different pre-given answers that appear in a text box on the screen. The NPC responds according to the answer that the player provides. During the conversation, the player can collect quotes by pushing a quote button, and at the end of each mission, he chooses which quotes to use in his news article.

Methodology

This research project is a qualitative case study inspired by ethnographic methodology (Heath and Street 2008), in which my goal has been to generate "naturally occurring" data in order to obtain an emic understanding of the practice I have studied. In order to collect rich and focused data on how students have been engaged with *GC: P in situ*, I have focused on two dyads. Videotaping these students' entire game play and the plenary discussions, conducting stimulated recall group interviews, interviewing the teacher, and making field notes, were the strategies chosen for collecting the corpus of data. The video material (approximately 8.5 h) constitutes the foreground in the analysis, and the additional data work as a background. By focusing on video data, I was able to document how the students and their teacher talk about, and make meaning of, the game *in situ*. All video material has been transcribed and systematized using thematic organization. The data were subjected to analysis of social interaction inspired by dialogical principles, in which joint construction of meaning, sequentiality, and act-activity interdependence (Marková and Linell 1996), are important analytic foci (see Appendix 1 for transcription conventions).[1]

In order to study in detail how interactions become constituted as resources for students learning in a gaming context, and how *GC: P* is constituted as a learning resource in this process, I will focus on one student's learning trajectory during the project. The reason for doing so is that this student is part of a population of students who are not very interested in academic subjects and issues, and who have difficulties expressing themselves in written formats. Jonas talks about himself as someone who generally does not read books or magazines in his leisure time, is not interested in the academic subjects at school, and who has a great preference for learning about things that he finds interesting. Outside of school, Jonas is preoccupied with motor-related activities, and is part of a community that is engaged in trail riding with motorcycles. However, despite the lack of interest in academic subjects, Jonas managed to produce an advanced news article for the final test, in which the multisidedness of the conflict and the challenges that both the Palestinians and Israelis are facing were made visible. Analyzing his learning trajectory can demonstrate how a computer game becomes a learning resource by means of which a student's participation changes significantly, and can point to different factors that contributed to his achievement.

I will undertake the analysis on two levels. First, I will provide an account of how the project in general is organized as a "temporal unfolding process" (Goodwin 1994, p. 607). Second, I will *zoom in* (Roth 2001) on three different episodes in Jonas' learning trajectory in which important orientations and reorientations are made, in cooperation with other interlocutors. I will focus upon three different episodes that took place on the first and second day of the project, and in addition analyze the news article that Jonas produced on

[1] All talk and writing appeared originally in Norwegian, and has been translated by the author. See Appendix 2 for the transcripts of the original spoken action and the original version of Jonas's news article from the final test. The Appendix is available online at the Springer site, doi: http://xxxx.

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the fourth day of the project. This enables me to capture Jonas' participation on at least two different timescales; the timescale of the specific episodes, and the timescale unfolding from the outset of the project to the final test. By employing this analytical strategy, I am able to trace Jonas' learning trajectory during the project.

In order to provide a detailed and fine-grained analysis of how a computer game is constituted as a learning resource, I have chosen to focus on a relatively small sample. Peräkylä (2004) has pointed to the fact that the possibility of the social practice that is analyzed can be generalized to other settings. What I am describing in detail are the processes and circumstances that made Jonas' achievement possible, which can be generalizable to other settings given the "same circumstances."

Results

In the initial stage of the project, the teacher gives a lecture in which students are encouraged to contribute with their own insights about the Israeli-Palestinian conflict relating to geographical, historical, political, and religious issues. The objective is to frame the game play and provide students with a common ground from which to explore the conflict through playing *GC: P*. The conflict engages students in different ways, and many of the students contribute with their own perspectives. Even though Jonas is paying attention to what the teacher and the other students are saying, he only provides minimal responses. During the lecture, which lasts about 15 min, only two comments can be heard from Jonas. The first utterance is a reply to the teacher's question about what the students know about the conflict: "Yes because they want each other's land it is like an old (..) they are of the opinion that the land is theirs and stuff." The second utterance is a reply to the teacher's question about why they call it the West Bank when it is located in the east of the Middle East area: "It is west in Jordan." After this joint discussion, the students start to play the first mission in *GC: P*, which is about a military raid carried out by the Israeli Defense Force (IDF).

A general pattern in the data is that during the hours of game play, there is little discussion about the conflict *per se*. When students play the game, they encounter different NPCs representing the different sides of the conflict, and listen to their stories. However, using these stories to reflect upon the challenges that real people face in this situation is not that frequent, and when such discussions occur, they are, first and foremost, facilitated by the teacher.

In the fourth and final day of the project the students are given a test, in which the major task is to write a news article about something they have experienced during game play. In the news article that Jonas produces he does not take a standpoint favoring either side of the conflict, but rather portrays its complexity. In his article, with the title "Palestinian Homes Under Assault!," he writes:

> In the assault 3 palestinians at the age of 15, 37, and 42 were killed. It turned out that there was nothing in the apartment that indicates that they were terrorists. This is one of several incidents where this happens, but how is it possible to be totally sure? This is an often posed question by the military forces.

In the final test, Jonas is able to produce a news story in which he describes the multisided nature of the conflict. He outlines the challenges that both sides are facing, and points to the major consequences that this conflict has for real people. How is this accomplishment made possible?

The concept of learning trajectory enables me to rewind the process that led to Jonas' performance, and zoom in on different episodes in which important orientations and reorientations are made that led to the adoption of a multiperspective on the conflict.

Episode 1: Trying out the game

When they first start to play *GC: P*, Jonas and his co-player are primarily oriented towards the opportunities and constraints in the game environment. Jonas is not oriented towards the multisided aspects of the game, but rather preoccupied with how to maneuver their avatar around in the game. Typical utterances are: "Is it possible to die in the game," "We can even run," "Can I be run over [by a car]," "He actually runs faster than the bus," and "He will not go up there." He is not particularly attuned to what the mission requires him to do in order to complete it. The following extract illustrates this orientation during game play Fig. 1.

Here, Jonas and his co-player are oriented towards finding out how to make their avatar travel through the simulated environment and gain a sense of what the avatar can and cannot do. However, finding this out is a collaborative project. Initially, Oliver produces an utterance regarding how to move the avatar to the left or the right (line 1). When Jonas responds to this utterance by suggesting that they should use the mouse, Oliver states that he finds it more productive to use the arrow keys to make the avatar turn (lines 3–4). However, when Oliver makes his preference for moving the avatar (while the avatar is walking) known, he is using the word "drive" (line 3) instead of "walk" or "run." When Jonas responds to this by producing the utterance "should have a car you know" (line 5), it seems like Jonas is picking up the word "drive" in Oliver's utterance. *GC: P* does not provide the player with the opportunity to move around in the game by using any vehicles, but this is an imagined possibility that Jonas finds relevant which is triggered by the utterance of his co-player. In his final utterance, produced as a response to Jonas' question about the possibility of moving around in a car, Oliver makes an explicit comparison between the opportunities provided for in-game actions in *GC: P* and *Grand Theft Auto* ("GTA" [line 8]), the latter being a popular computer game that is played by several of the students in their leisure time. By producing the utterance "it's not like GTA or something" (lines 8–9) Oliver implies that there is a great possibility that *GC: P* does not provide the same opportunities for action that *Grand Theft Auto* does.

At this point in Jonas' learning trajectory, he and his co-player are oriented to ways of playing computer games in general. In order to engage efficiently with this learning resource, Jonas and his co-player must figure out how they can control their avatar, and what the game design allows them to do. Finding out how to maneuver their avatar is a collaborative project, in which experiences with computer games outside of school are used as a resource for understanding how to participate competently in the simulated environment.

Fig. 1 Trying out the game

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1   Oliver:  How do you make a turn
2   Jonas:   You move the mouse
3   Oliver:  It is much better to drive with the arrow
4            keys
5   Jonas:   Should have a car you know
6   Oliver:  Y-e-eah (.) steal a car
7   Jonas:   Is that possible
8   Oliver:  I don't know it's not (..) it's not like GTA
9            or something
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However, Jonas and Oliver are not yet attuned to the multisidedness of the conflict. Learning how to maneuver their avatar is crucial for playing the game successfully, and Jonas' interaction with Oliver is important in this regard. Jonas and Oliver use each other's utterances as resources for understanding how to play the game. Still, this activity does not in itself provide Jonas the opportunity to engage with the perspectives or voices of the conflict which might enable him to grasp its complex nature. In order to gain this insight, the players have to encounter different NPCs that might provide information about the topic that they are supposed to investigate and about which they are to write an article on. After a while, as displayed in the next episode, Jonas is starting to orient towards this aspect of the game with the help of his teacher.

Episode 2: Starting to orient towards the multisidedness of the conflict

In the first mission, Jonas and Oliver follow the Israeli Defence Force (IDF) on a military raid. The IDF has received what it believes to be reliable information about a Palestinian man who is in possession of missiles to be used in a possible attack on Israeli targets. When they arrive at the location for the raid, the Palestinian man is taken out of his house by the soldiers and forced to the ground with his hands to his head. The soldiers search the house, find the missiles, and arrest the man. The soldiers explain (to the journalist) that by hindering the production and smuggling of weapons into the area, the IDF is capable of reducing the number of terrorist attacks, and emphasize that they are proud to be part of this activity, which they perceive as a duty. The Palestinian man tells a story about how the Israelis are stealing the land of the Palestinian people, invading their homes, and damaging their property. He also explains that the accusations against him are groundless, and that the house in which the missiles have been located is no longer in his possession. During this event, Jonas constantly refers to the Palestinian man as "the prisoner."

Later that day, Jonas and Oliver are about to write an article about the military raid. I will now zoom in on the second episode, in which Jonas and Oliver are confused about how to write the news article in order to move forward in the game and complete the mission. The teacher suggests that they consult the editor of the newspaper for guidance. But when they encounter this NPC, they are encouraged to go back to the location of the arrest of the Palestinian man. They have collected some quotes, but are denied the opportunity to write an article, and they summon the teacher to discuss the problem that has occurred. This is an example of a task-oriented activity, in which students have to solve a specific problem embedded in the game. The teacher asks whether they have talked to different NPCs, and brings up the issue of collecting quotes during such conversations, thereby orienting Jonas and Oliver towards the solution to their problem. The students then display the different quotes that they have collected so far, and the theme of multisidedness becomes relevant Fig. 2.

In order to help Jonas and Oliver solving the task they are facing, the teacher redirects their attention towards their choice of newspaper to write for. Thereby, he implies that the choice of newspaper has implications for how one solves this task (lines 10–11). Jonas and Oliver have decided to write for *Global News*—the European newspaper which is supposed to be neutral—something that has to be mirrored in the article. So far they have only collected two quotes for their article, and both quotes are from the Israeli soldiers that carried out the military raid. Therefore, based on the information they have collected, they are only able to voice one of the sides of the conflict. The teacher is aware of the fact that the article has to mirror both sides, and utters "perhaps you should ALSO have a quote

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10  Teacher:  Eh-h bu-ut yes (.) which newspaper are you
11            going to write for yes it's Global News
12  Jonas:    Yes
13  Teacher:  Perhaps you ALSO should have a quote from the
14            other side then
15  Oliver:   What other side
16  Jonas:    (overlapping) What side what side
17  Teacher:  Well now you've got (..) now you got two
18            quotes from Israelis (..) what they tell
19  Oliver:   (overlapping) Is it different sides to
20  Jonas:    Yeah but that prisoner he was like
21  Teacher:  (overlapping) That prisoner he was like is
22            like in a way the other side...
23  Jonas:    (overlapping) Yes
24  Teacher   ...isn't he
25  Jonas:    (overlapping) Yeah
26  Teacher:  "Yeah"
27  Jonas:    Shall we go to the prisoner
28  Teacher:  Have you FOUND have you talked to somebody
29            that MIGHT have something...
30  Jonas:    (overlapping) There is the taxi
31  Teacher:  ...but they are still standing there look (.)
32            look at the map
33  Jonas:    (overlapping) Yes we are we are going to take
34            a taxi over there now
35  Teacher:  Yes do that (.) because I believe you have
36            left the scene where things take place
37            before the act is over
38  Jonas:    Then they are just slow
39  Oliver:   (overlapping) Yes but we just got yelled at
40            for being there so we just left
41  Teacher:  Yes I see (...) but then you perhaps know how
42            to NOT become a star journalist then (.) x x
43            no ok I just leave then
44  Jonas:    (overlapping) Yes but x x but he became so
45            damn cranky since we were being like nice to
46            the prisoner
47  Teacher:  Think about (...) think about think about
48            this as a real situation (.) and if you had
49            like (.) if you had to be there as a
50            journalist and cover what happens and then
51            someone tells you huh get out of here (.)
52            then you mustn't do it then you must eh-h
53            think that here it is really a good reason
54            to stay
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Fig. 2 Starting to orient towards the multisidedness of the conflict

from the other side" (lines 13–14). By producing this utterance the teacher implies that the content of the quotes has to mirror both the Israeli and the Palestinian side, thereby starting to orient the students to the multisidedness of the conflict. As the utterances "what other side" (line 15), "what side what side" (line 16), and "is it different sides to" (line 19) indicate, Jonas and Oliver are not yet attuned to this aspect.

Then, by making the students aware that they only have quotes from the "Israelis" (line 18), the teacher also makes them comprehend that what is being told in these quotes belongs to a specific side or a voice in the conflict. By uttering "what they tell" (line 18), the teacher orients the students to the event that took place earlier during game play, and to the possibility that the content of the quotes belongs to a specific perspective that is voiced by specific NPCs in the game – in this case, the Israeli soldiers. He uses what has been uttered by the NPCs in this event as a resource to help the students understand that they have encountered different sides of the conflict, but also that the content of the quotes they have collected only describes one part of the overall picture. This becomes a turning point in Jonas' learning trajectory. The teacher's orientation enables Jonas to reflect upon the role of the prisoner, another NPC that Jonas and Oliver encountered earlier that day during game play, and the relationship between his voice and the voice of the Israelis. Since Jonas utters "yeah but that prisoner he was like" (line 20), as an answer to the teacher's statement about the content of the quotes they have collected so far, it is reasonable to assume that Jonas has now gained insight about the fact that they have been in touch with an NPC that does not

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belong to the same side as the Israeli, who is thereby voicing a different side of the conflict. The teacher picks up what is insinuated by Jonas, and adds the information "is like in a way the other side" (lines 21–22).

In the beginning of the episode, Jonas is confused about how to move forward in the game to complete the mission. He has not yet understood that the different NPCs to whom he talks during game play are representatives of the different sides of the conflict, and that the article that he is going to write has to contain both perspectives. With a little help from the teacher, Jonas' participation changes. By being enabled to reflect upon the relationship between the Israeli soldiers and the Palestinian prisoner, Jonas understands that what is being said by the different NPCs belongs to different voices of the conflict, and he gains insight into the multivoicedness of it. He realizes that both sides of the conflict must be reflected in the article, and provides the group with a possible solution to solving their problem. The fact that Jonas is heading to the prisoner confirms that he has gained new insight (lines 33–34). Since they now understand that the prisoner represents the other side, they are able to collect quotes from both sides and write a proper article.

After this sequence in which Jonas has started to orient towards the multisidedness of the conflict, he and Oliver are producing justifications for not collecting the necessary information from the NPCs they encountered during the military raid. In the utterance displayed in lines 39–40, produced as a justification for leaving the location of the raid too early, Oliver explains that they were not being treated with respect. Jonas picks up Oliver's argument, but expands it by adding the reason for not being treated with respect ("we were being like nice to the prisoner" [lines 45–46]). This kind of participation also tells us something important about classroom interactions between students and teachers. Such justifications can be interpreted as strategies adopted by the students in order to not lose face in a learning situation (Silseth and Arnseth 2011).

As seen in lines 41–43 and 47–54, the teacher is trying to bridge the game play and the world outside the classroom. Here, he uses this event in the game as a resource to reflect upon journalistic activity in general, and to orient the students to the fact that the activities in which they are engaged through the game represent possible scenarios outside of school.

Episode 3: Reflecting upon the multisidedness and the challenges people in this conflict are facing

The second day of the project takes place 2 weeks after the introductory day. This lesson starts with the teacher talking about a fight, which took place at school sometime during these 2 weeks, in which students in the class clashed. Seemingly racist utterances triggered the situation. The teacher talks about the importance of taking the other's perspective, and the ability to understand how utterances that are not necessarily intended to do any harm can be interpreted by others in negative ways.

The plenary discussion starts by recapitulating what *GC: P* is generally about, and moves on to the first mission, the military raid, that the class played 2 weeks earlier. The third episode starts with the teacher posing a question about the IDF's motive for carrying out the action against the Palestinian man. This episode of Jonas' learning trajectory documents how the computer game becomes a resource for reflecting upon the multisidedness of the Israeli-Palestinian conflict, and how a turning point in Jonas' conception of the conflict unfolds. However, cultural resources from outside the classroom are also recruited and become important in facilitating this reflection. The participants in the

following episode, which is displayed in Figs. 3, 4 and 5, are Jonas, Oliver, Tim, US1 (unknown student 1), US2 (unknown student 2), and the teacher. The discussion is orchestrated by the teacher, who brings up what the students have experienced while playing the first mission. However, the experiences that the students have gained during game play are also used as a resource to reflect upon the Israeli-Palestinian conflict in general.

The teacher starts this sequence in the plenary discussion by inviting the students to give an account of why IDF/Israel perceived the military raid, and the arrest of the Palestinian man, as a necessary action. By using the noun "standpoint" (line 56), the teacher is giving voice to one of the sides of the conflict, thereby making the students aware of the fact that this particular action is carried out as a result of a specific perspective on the conflict and is not something that just happens. "That kind of action" (line 57) is the result of a specific agenda. In order to give such an account, the students have to take the stance of one of the sides of the conflict.

When Jonas gives his account he takes the stance of IDF, and explicates that the reason for carrying out such activity is to obstruct the use of missiles on the Israelis (lines 62 and 65–66). The teacher acknowledges Jonas' account, by stating that it is perhaps obvious and implies that it is something that everyone should have understood. However, he is also using Jonas' utterance as a way of expanding the students' view of this situation by addressing the justification for carrying out this kind of activity. When the teacher utters "is it likely that they WOULD HAVE been used" (lines 69–70) he orchestrates a situation in which the students have to evaluate IDF's decision to carry out the military raid. At the same time it is also an evaluation of the other side of the conflict. The students also have to take the stance of the Palestinians and ask themselves if it is reasonable to believe that they would have used the missiles. The teacher thereby orchestrates a situation in which at least two different voices are coming into contact. He also orchestrates a situation in which the students have to use their experiences during game play, and what the NPCs representing the different sides said, as resources for reflecting upon these issues.

When answering the teacher's question, US1 responds negatively, and Jonas responds positively, also supported by Tim. Hence, at this moment Jonas argues that the military raid can be justified. To contrast this stance, US1 points to the fact that the missiles were not used, insinuating that Jonas and Tim are just speculating. Tim then argues against this view by stating that it is not common to have missiles in the house, and that they exist for a

Fig. 3 Reflecting upon the multi-sidedness and the challenges people in this conflict are facing (1)

```
55  Teacher:  Bu-ut (…) from from the standpoint of the IDF
56            from the standpoint of ISRAEL (.) why was it
57            necessary to carry out that kind of action
58  US1:      Because-e-e it was
59  US2:      (overlapping) x x
60  Teacher:  (overlapping) Put your hand up put your hand
61            up put your hand up
62  Jonas:    Prevent against terror
63  US1:      (overlapping) x x x put in prison
64  Teacher:  Hm
65  Jonas:    Prevent against that they are being used
66            (.) the missiles he had
67  Teacher:  Yes of course (.) right (.) it is perhaps
68            obvious but it is somehow alright to say it
69            (.) to obstruct the use of them (..) is it
70            likely that they WOULD HAVE been used
71  US1:      No
72  Jonas:    Yes
73  Tim:      Yes
74  US1:      They are not being used
75  Tim:      One certainly HAS those for a REASON and
76            "they are not just in" the house
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Fig. 4 Reflecting upon the multi-sidedness and the challenges people in this conflict are facing (2)

```
77   Teacher:  No (.) it happens eh-h (.) it happens that
78             kind (.) well eh-h weapons are being used
79             terror attacks are being used (.) eh perhaps
80             not always in the shape of missiles (.) it
81             is...
82   Jonas:    (overlapping) x bombs
83   Teacher:  ...more like these suicide bombers have sort
84             of been that the...
85   Oliver:   (overlapping) TREND
86   Teacher:  ...what occurs (.) the trend that occurs
87             relatively (.) often in when eh-h (...) eh
88             Palestinians or Palestinian factions are
89             going to attack Israel
90   US1:      Because Israel attacks first
91   Teacher:  Yes (.) and then we take the OTHER
92             perspective from his how-w (.) why is this
93             criticizable why is it NOT ok (.) what
94             happened (.) they blew up the door went in
95             brought out a man (.) he was standing out on
96             the street with [gesticulating that he holds
97             his hand to his head] "right"
98   US1:      They "can" first knock at the door to see if
99             anyone is home
100  Teacher:  They could knock they could knock at the door
101            [laughs]
102  Oliver:   x x he had taken the back door right or they
103            could have sent one of those missiles through
104            the door
105  Teacher:  Yes (.) eh they he could have sent missiles
106            through the door I don't know if he would
107            have done just THAT it it would perhaps be
108            equal to (.) a suicide-e (.) attack in that
109            case but-t
```

reason (lines 75–76). He is, thereby, addressing the issue of suspicion, which is picked up by Jonas and problematized later in the episode.

The teacher acknowledges Tim's claim, and describes a situation in which some Palestinian factions are known for carrying out terrorist attacks (lines 77–81). However, by explaining to the students that the strategy of using suicide bombers is in reality used more often than using missiles (which is the weapon addressed in the game), he also directs the students' attention to the fact that the theme they are now discussing is connected to the

Fig. 5 Reflecting upon the multi-sidedness and the challenges people in this conflict are facing (3)

```
110  US1:      But it is perhaps not his missiles perhaps
111            someone has put "them there"
112  Tim:      (overlapping) The neighbor x
113  Teacher:  Right (.) AND THAT WAS WHAT HE SAID he didn't
114            know anything about these missiles (.) that
115            was what HE said when we interviewed HIM
116  Tim:      Yes but that is what everyone says
117  Jonas:    But that is certainly also what they do for
118            real they certainly don't CHECK in advance it
119            was that one guy that got SHOT because he had
120            a wire or something
121  Teacher:  Yes
122  Jonas:    There was nothing on him but they thought he
123            was a terrorist...
124  Teacher:  (overlapping) Yes
125  Jonas:    ...because he looked like one so they
126            certainly shot him right a way
127  Teacher:  Yes (.) right (.) a person can be shot
128            because he carries with him some wires he
129            can be an electrician (.) right but then (.)
130            then one gets SUSPICIOUS and then (.) one
131            acts on the grounds of that (.) so it is it
132            is very difficult it is it is security (.)
133            for one part of the population (.) eh-h that
134            makes them feel that they have to eh-h (.) do
135            certain things that (.) in turn put others in
136            danger (.) so this is not easy
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world outside the classroom. Using the phrase "trend," in the utterance displayed in lines 86–89, could be interpreted as the teacher's attempt to include Oliver in the discussion that is taking place. In the same utterance we can see that the teacher shifts from talking about "Palestinians" (line 88) to talking about "Palestinian factions" (line 88), which indicates the teacher's awareness of the danger of making generalizations based on particular events.

Then US1 gives voice to the Palestinian side by arguing that suicide bombing is something that is carried out as a necessary reaction to Israeli attacks (line 90). This utterance takes the discussion in another direction. Until now the discussion has been centered on the reason for IDF's decision to carry out a military raid and the justification for this decision. By picking up this utterance made by US1, the teacher reorients the students' attention towards the other voice of the conflict, without giving a final answer regarding the justification for the military raid. Furthermore, when the voice of the Palestinian man is recruited, the statement of US1, which is somewhat very general, is made more concrete and personal. When the teacher utters "then we take the other perspective from his how-w" (lines 91–92), he implies that the other perspective is to be found in the NPC who was taken prisoner in the military raid. He tells a story about what happened in this event of the game play 2 weeks prior to this discussion, and uses it as a resource for making the students engage with this other voice.

In his response to the teacher's question "why is it NOT ok" (line 93) to carry out such actions that the military raid represents, US1 seems to focus on the lack of politeness when he utters "they can first knock at the door to see if anybody is home" (lines 98–99). By repeating what US1 utters, accompanied by laughter, the teacher signifies that this proposition is somewhat unrealistic in regard to military interventions. However, Oliver takes US1's utterance seriously and points to the result of being too polite under such circumstances (lines 102–104). Thereby, he also addresses the theme of suspicion. The teacher then produces a normative evaluation of Oliver's statement, but this statement is somehow ambiguous. He states that he is reluctant to believe that the Palestinians would have sent the missiles through the door, if the Israeli soldiers had first knocked at the door, but that if they had done so it would be equal to a suicide attack. In a way this utterance does not make sense, but he seems to be trying to make the students aware that this kind of action is not something desirable from an ethical point of view.

In the final part of the episode, Jonas joins the discussion, however, now participating in a different way than he did earlier in the episode.

US1 continues to give an account of why the military raid can be criticized. He implies that there exists a possibility that the missiles did not belong to the Palestinian man but that somebody else has placed them there (lines 110–111). Then, the teacher is "revoicing" (O'Connor and Michaels 1993) this student's formulation. The concept of revoicing describes, among other things, the strategy of giving voice to a student's sometimes weak and vague formulations, reformulating it to make it clearer, but at the same time let the student retain ownership of what is being expressed. By pointing to the fact that the prisoner did explain that "he didn't know anything about these missiles" (lines 113–114), the teacher is revoicing US1's formulation, giving him a stronger voice, and thereby makes the account more credible. At the same time, the prisoner, and what he said, becomes a crucial resource for the teacher in orienting the students to the multisidedness of the conflict. By revoicing the formulation, the teacher attunes the students to the possibility that the Palestinian man might be innocent, and that the military raid therefore cannot be justified. However, by uttering "that was what HE said when we interviewed HIM" (lines 114–115) he reminds the students that this is only one side of the conflict, representing one voice, and not a final evaluation of what is right and wrong.

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As displayed in lines 117–120, 122–123, and 125–126, Jonas suddenly tells a story about an innocent person who was assassinated for appearing suspicious, something that represents a turning point in Jonas' participation and his learning trajectory. In the stimulated recall interview, Jonas elaborates on these specific utterances. He explains that he was referring to a story that he had witnessed on the television news, about a boy who was shot by the Israelis for just standing at a train station with some wires hanging out of his pockets. By appearing as what is defined as suspicious, this innocent boy was assumed to be a terrorist and was thereby being killed. When the revoicing is made, that both gave voice to a peer student but also to the Palestinian man, Jonas was able to take the stance of the Palestinian side. However, this shift was also partly made possible by the recruitment of the voice of this innocent boy from the news that Jonas had been in contact with outside school prior to this moment. In the utterance "but that is certainly also what they do for real" (lines 117–118), Jonas connects the brutal treatment of a possibly innocent person ("that") that he witnessed during game play to a real situation that he observed when watching a news program outside school ("for real").

In the first part of the episode, Jonas explicates the IDF's reason for carrying out the military raid; he addresses the need for security, and claims that the missiles would be used by the Palestinian side. However, he does not support his claim in any manner. In the final part of the episode, Jonas' participation changes significantly. Jonas picks up on what Tim has been talking about regarding suspicion (lines 75–76 and 116), problematizes it, and elaborates on what consequences such suspicion might have for innocent people. While earlier Jonas has solely been focusing on the need for security, he now reflects upon the problems with one party's desire for security. Jonas is able to orient towards the other perspective, thereby making the multisidedness or multivoicedness of the conflict visible for himself and the other students. In his final utterance (lines 127–136), the teacher picks up the story that Jonas told as a closing of the plenary discussion, in which he emphasizes the complexity of the conflict.

The final test

The final test is the tentative ending point of Jonas' learning trajectory. This is what the different reorientations and turning points during the different episodes led up to. His entire paper is displayed below Fig. 6.

In this performance, rather than taking a standpoint favoring either side of the conflict, Jonas is able to produce a news article that portrays the struggles that both sides of the conflict face. Furthermore, Jonas is using insights that have been developed in the interactional episodes that have taken place during the project as resources for producing this type of utterance which the news article represents. The news article demonstrates how Jonas has adopted a multiperspective stance about the conflict.

The news article is organized into three different sections (lines 138–148, 149–167, and 168–174). In the first section, Jonas writes about how terror attacks have been carried out and states that anti-terror operations have been instigated as an answer to this kind of action. He uses phrases like "increases the security" (line 142) and "obstruct these attacks" (lines 142–143) which touch upon themes that were addressed during the classroom interactions based on the game play. He writes about how Israeli forces receive information about possible terrorists, and points to the problem of uncritical trusting these sources, since carrying out actions based on this information often results in injuring and killing innocent Palestinians. He draws on perspectives he has gained during the project, and points to the problem with one side's need for security.

Then, in the second section, he tells a story about an imagined assault on a Palestinian home, which brings up the same theme that was discussed during the project based on the first mission in the game. The story is about a Palestinian family that is assaulted by Israeli

Fig. 6 Jonas' news article on the final test

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Palestinian Homes Under Assault!

In the conflict between jews and palestinians it has
lately been many terror attacks where civilians and
military has been injured or killed. This leads to a
situation where the jewish military forces now
increase the security and do more to obstruct these
attacks. They often receive tips about where
"possible" terrorists are located and perhaps
sometimes trust the sources too much. This leads to a
situation where many innocent people are being killed
and injured during anti-terror operations that are
being carried out.

As recently as today a house was assaulted by Jewish
forces. Rumors had told that the family that lived
there had contact with several terror groups and that
they were potential terrorists. Yesterday missiles
were found in another house nearby, but this time it
was wrong. In the assault 3 palestinians at the age
of 15, 37, and 42 were killed. It turned out that
there was nothing in the apartment that indicates
that they were terrorists. This is one of several
incidents where this happens, but how is it possible
to be totally sure? This is an often posed question
by the military forces. Under these conditions that
we have seen so far, it is very difficult to know the
difference between innocent civilians and possible
terrorists. It is a choice they have to make, if they
will sacrifice innocent people that can be killed
during anti-terror operations, or if they will put
many others and their own lives in danger of terror
attacks that could be obstructed.

It is few people that know how this will continue,
but what everyone knows is that many lives will be
lost before this ends. In a statement made by the
General we are told that if the terror attacks
continue there will be carried out drastic counter
attacks. The check points will also be tougher and it
will be difficult to get into the city.
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forces based on rumors about this family allegedly being connected to terrorist factions. This assault results in the killing of three family members. However, after the assault no evidence of the family being connected to terrorist activities was found.

Jonas clearly sees this as a problematic situation. However, he also addresses the challenges that Israeli forces are facing and points to the difficulties of knowing "the difference between innocent civilians and possible terrorists" (lines 161–162), and to the difficult choice they have to make in regard to whether they will "sacrifice innocent people that can be killed during anti-terror operations" (lines 164–165) or "put many others and their own lives in danger of terror attacks that could be obstructed" (lines 165–167). By telling a story about a particular event, in which innocent Palestinians are assassinated by the Israeli forces as a result of suspicion, and, at the same time, recognizing that the Israelis need to take security seriously, he makes visible both the voice of the Israelis and the voice of the Palestinians.

In the final section, Jonas writes about the difficulties of ending this kind of conflict, and that it might continue for a long time, something that will have fatal consequences for the people of both sides who live in the area (lines 168–170). In the two last sentences he reminds the reader of the hopelessness of the current situation; that one side's attack on the other will always be met by a violent response (lines 170–174).

Jonas is using both his experiences from the game play itself, and his insights into the conflict developed during discussions that took the game as a point of departure, as resources for producing his news article. For Jonas, the interactions that took place, based on playing the computer game *GC: P*, have been constituted as valuable

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resources that provided him with insights into the multivoicedness of the Israeli-Palestinian conflict.

Discussion and concluding remarks

The detailed study of how students and their teacher interacted in a gaming context has enabled me to investigate how specific interactions have been constituted as effective resources for a student's learning trajectory. Analyzing three different episodes, in which important orientations and reorientations took place, made it possible to see how Jonas' learning trajectory developed and changed during the project. Furthermore, by choosing this particular focus I have also documented how a computer game became a learning resource through different interactions that made the evolution of the trajectory possible.

Of course, it would be possible to use other learning resources as resources for discussing topics connected to the Israeli-Palestinian conflict, such as, for example, a textbook. When playing *GC: P*, students encounter different perspectives, voiced by specific NPCs, thereby making what is told quite concrete and personal. It is reasonable to assume that students also could encounter such personal stories by reading a book about the conflict, if such a personal aspect of knowledge content were embedded. However, when students play *GC: P* they have to manoeuvre their avatars around in the simulated environment in order to encounter these personal stories, and engage in dialogue with NPCs that they to some extent control. Hence, one could argue that there is a difference in agency (Gee 2004; Schott 2006) between these kinds of learning resources. *GC: P* provides learners a different way of engaging with knowledge content than textbooks do.

The data indicate that the constitution of a computer game as learning resource is a collaborative project in which multiple resources for meaning-making are in play. The findings suggest that a computer game is not a particular learning resource *per se*, but is rather constituted as such in multiple ways, something that is of great importance to reflect upon when using computer games for learning purposes in educational settings. Here, I will highlight and discuss some of the findings that are relevant in regard to the question of how GBL might be realized in schooled practices.

When engaged in game play in educational settings, experiences with playing computer games outside of school can relevantly be invoked. If one perceives games as constituted as learning resources in interaction, and studies how these interactions unfold, it becomes possible to document how students use experiences from their engagement with games at home or other leisured spaces in specific ways when collaboratively trying to figure out how to play games competently. As seen in the first episode, trying out what the avatar could do in the simulated environment is an activity that is very much relevant in this learning situation. At first sight, the activity of finding out how to move around in the game might seem rather trivial, but is in fact an important factor in the constitution of *GC: P* as a learning resource. In order to understand how computer games are constituted as learning resources in schools, educationalists and researchers should take students' "gaming literacies", and how these literacies are negotiated collaboratively when playing the game, into account. When perceiving games as constituted as learning resources in interactions it becomes possible to see how the imagined possibilities in the game – the possibilities for action that the players envision to exist in the game – are something that is negotiated by the participants. The person(s) one plays together with might "open up" and/or "close down" the imagined possibilities in the game. As seen in the interaction displayed in the first episode, Jonas' imagination of what he could do was triggered by the utterances of his co-player. Then, his co-player adjusted their understanding of what they could do by comparing

the game with another game they have engaged with outside school. Hence, the imagined possibilities are negotiated by drawing on experiences with playing computer games in general.

However, the use of informal game competencies when playing computer games at school is often not enough to cultivate a subtle understanding of the specific topic that is addressed in the game, in this regard the Israeli-Palestinian conflict. In order to cultivate educational practices in which computer games are constituted as learning resources that foster such insights and understandings, some important factors should be addressed. In computer games, such as *GC: P*, it is quite possible to encounter different NPCs without reflecting too much upon the stories that are voiced by them. As seen in the second episode, students have been encountering different NPCs in the first mission and collected quotes on their way, but still have problems writing an article that mirrors the multisidedness of the conflict. A conversation about possible reasons for the problem took place, in which Jonas was enabled to reflect upon the role of the Palestinian prisoner and the relationship between this NPC and the NPCs representing the Israeli side. He then grasped the fact that what was being said by the different NPCs belongs to different voices of the conflict, and gained insight into its multivoicedness. Thereby, Jonas was able to solve the task of collecting quotes from both sides, move forward in the game, and complete the mission. However, prior to this episode the students were not attuned to the "sidedness" of what they encountered during game play. As seen in the third episode, Jonas' participation changed significantly. Here, *GC: P* became an important resource for reflecting upon the multisidedness of the conflict and the challenges that people on both sides face in their everyday lives. A portrayal of the Israeli-Palestinian conflict as multisided and complex is also reflected in Jonas' paper on the final test.

However, even if *GC: P* situates learning in an embedded and realistic setting, thereby potentially making learning more authentic, data suggest that the role of the teacher in facilitating subtle reflections is of crucial importance. Situations, in which such reflections do occur, are very often facilitated by the teacher, both during the actual game play and in follow-up activity. According to Egenfeldt-Nielsen et al. (2008), the teacher has an important role in the success of GBL in schooled practices. These authors have stressed the importance of a skilled teacher who, for instance, manages to bring together the different experiences that students have during game play. Still, there exist few detailed accounts of how student-teacher interactions might function in beneficial ways. Studies have shown that attempts to combine gaming activities with existing curricula is often deemed to fail (Egenfeldt-Nielsen 2006; Mitchell and Savill-Smith 2004), and the need for rethinking how GBL should be integrated in schooled practices seems particularly pertinent. In Squire and Barab's (2004) study of *Civilization*, findings suggest that for the game to be appropriated and constituted as a valuable learning resource it has to be perceived by the students as a resource that connects to their own interests. This means that students GBL have to become linked to other learning trajectories that the students develop in other moments of their life trajectory. A crucial objective for the teacher is then to orchestrate learning situations in which such linking of trajectories does occur. The findings in Nash and Shaffer's (2010) study of *Urban Science*, indicate that the interaction between student and mentor was an important factor that contributed to the student's development of autonomous professional ways of thinking about urban planning. Furthermore, within the CSCL community, Ke's (2008) study has demonstrated that computer games can improve math learning among students when they are part of collaborative activities, and that the success of GBL is related to the cultivation of learning environments that the students find meaningful. Hence, cultivating such learning environments is a crucial task for teachers who are planning to use computer games in their own teaching.

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However, these studies do not pay attention to the details of how student-teacher interaction becomes a resource for a student's GBL. What then, was characteristic about the student-teacher interactions that contributed to a student's learning trajectory in the present study? As seen in the second and third episode, the teacher has an important role in reorienting the students and expanding their understanding of important issues that are raised in the game, such as the multisidedness of the Israeli-Palestinian conflict, and in bridging the game play with the world outside the classroom. In the second episode, the students were facing a task of solving a specific problem. They did not know how to write a proper article and complete the first mission. However, the data suggests that the teacher both helped the students managing their task and at the same time made them understand that the different NPCs in the game are voicing different perspectives on the conflict. The teacher is using prior game experience to attune the students to the aspect of "sidedness". By referring to specific NPCs that the students have encountered during game play, and connecting these NPCs to what the students have done so far (collecting two quotes from one side), the teacher uses the students' own experiences with the game to help them solve the problem, but also to gain insights into the multivoicedness of the conflict.

In the third episode, the aspect of "sidedness" unfolds quite differently. Here, Jonas participation changes, and he demonstrates a more subtle understanding of this aspect. In the discussion that took place after the game play, the teacher draws together the different experiences that the students have gained, and the different positions they have adopted. However, an important factor that contributed to this situation was the teacher's use of student's specific experiences as resources for the discussion. In the discussion, the teacher makes the students evaluate the different sides of the conflict, based on their own experiences. By constantly referring to specific episodes in the game play, he connects what they have experienced during game play to the world outside the classroom, and uses these experiences as resources for discussing the "sidedness" of the conflict. He makes the students take specific stances on the conflict, and continually uses the students' utterances as a way of expanding their understanding of the aspect of "sidedness". Furthermore, the teacher makes the students use the stories they have been told during game play when giving their accounts of what happened and their evaluations of the different actions. In this way, the teacher orchestrates a "dialogic space" in which the different voices of the conflict are given the opportunity to "inter-animate" each other.

As the data suggests, the teacher's revoicing of a student's utterance enabled Jonas to take the stance of the Palestinian side. The teacher made a student's somewhat vague formulation clearer and more concrete, by referring to what happened in the game and to what a specific NPC uttered, something that gave voice to both a peer student and to the Palestinian prisoner. The act of revoicing triggered Jonas to participate in a different way than he has done prior to this moment. However, another important factor contributing to the change in Jonas' participation during the third episode was the recruitment of a news story about the conflict that Jonas had encountered outside the classroom. When the revoicing was made, Jonas was enabled to draw on his experiences with the conflict from outside the classroom and connect it with what he experienced during game play. Jonas was enabled to take "the other perspective", and grasp the fact that what happened in the game to some extent is representative of what happens in real life. Hence, he was enabled to make the multivoicedness of game play and the Israeli-Palestinian conflict visible for himself and the rest of the classroom community.

When computer games, such as *GC: P*, are employed for learning purposes in school, they become part of sociocultural practices in which multiple resources are recruited from different places in the process of constituting them as learning resources. Perceiving gaming activity in school as an isolated practice might undermine the potential of GBL. In order to

realize the potential of GBL in educational contexts, it is important to pay attention to how these different resources become interconnected in specific ways that facilitate learning in which a subtle understanding of what is addressed in the computer game might be fostered.

Koschmann (1999, 2001) and others have outlined a dialogic perspective on learning as a vital approach within the CSCL research community. This study contributes to this line of thought, and documents how dialogic theory can enable us to study the affordances and constraints of GBL. Based on what I have documented in this study, I propose that in order to gain insight into the success or failure of GBL it is crucial to study computer games as they are constituted into learning resources in classroom interactions, and to study how students and teachers in cooperation makes the computer game meaningful for their specific learning purposes and objectives.

Furthermore, these findings raise broader questions about how learning in school should be conceived more generally. Leander et al. (2010) have recently posed the timely question: "how do people traverse or otherwise connect one environment with another in their everyday lives?" (p. 331). The findings reported in this study challenge a container-like metaphor for describing classroom practices. The analysis suggests that Jonas' learning trajectory is intersected by other trajectories from outside of school. First, in order to understand how to manoeuvre his avatar in the game, he picked up prior learning trajectories about how to play computer games in general. Second, by recruiting a story from the news about one of the perspectives in the conflict, he picked up on a learning trajectory about the Israeli-Palestinian conflict which developed outside of school. Even if the final test is the closure of the analysis of Jonas' learning trajectory in a school project, this trajectory can be continued or picked up in other settings in his life, as, for instance, with his family around the dinner table or in the garage tinkering with a car with friends. These findings suggest that in order to understand GBL, and learning in school more generally, an important future task is to analyze how different learning trajectories intersect and become relevant in education.

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Appendix 1

Transcription conventions

Sign	Explanation
(.)	Pause that lasts less than half a second
(..)	Pause that lasts between half a second and 1 s
(…)	Pause that lasts longer than 1 s
-	Interruption
(overlapping)	Overlapping talk
"__"	Garbled words or expressions
×	Words that cannot be deciphered at all
Caps	Emphasizing words and expressions
e-e-e	Words or sounds that are held

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