

Affordances for In-Game Interaction and Language Learning Through Children's Collaborative Play in Minecraft

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ABSTRACT

Playing video games engages children and youth and offers a potential for learning in general and situated language learning in particular. The aim of this paper is to explore the situated conditions and affordances for facilitating in-game interaction, as well as to discuss the language learning potential and educational implications of these conditions. In this paper, this is discussed through two datasets: a) a pre-study, a survey among students in grades 4–7 ($n = 65$), as well as b) playtests with child volunteers ($n = 6$), conducted in pairs in a laboratory setting. The results are discussed in relation to interactional practices, what game genres and mechanics are relevant to tandem language learning and the implications that in-game competence might have on such learning.

KEYWORDS

Interaction, Game-Based Learning, Tandem Language Learning, Video Games

INTRODUCTION

Playing video games is a big part of the lives of children and youth in Finland (Kinnunen et al., 2022; 2024), as it is elsewhere. Playing can offer social interaction despite physical distance and function as both a relaxing and mentally stimulating activity (Barr & Copeland-Stewart, 2022). The educational potential of video games gained academic traction in the early 2000s, for example, with Gee (2007), who positioned the player as more than a consumer; the player is an active problem solver and co-creator of the game narrative. In a Finnish context, employing video games for educational purposes corresponds with the *National Core Curriculum* and the emphasis on utilising “the possibilities offered by games and gameful learning” (Finnish National Agency for Education, 2016, Chapter 4.3).

This paper is part of a research project exploring the potential for reciprocal language learning through in-game interactions. It explores the situated conditions and affordances for facilitating

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language learning through in-game interaction and discusses the educational implications of these conditions. The study is guided by three research questions.

1. What do students' out-of-school gaming practices, particularly in terms of interaction, look like, and how might these practices impact the potential for reciprocal language learning? (RQ1)
2. What themes can be identified in the young players' discussions during the playtesting sessions? (RQ2)
3. How does the in-game context and/or the chosen task affect the interaction between the players? (RQ3)

The analysis builds on a two-step research design, where the pre-study consists of a survey (both close-ended and open-ended questions) among students (9–14 years old) in four schools collaborating with the project group. Both steps of the study follow the ethical principles of research with human participants in human sciences as stipulated by the Finnish National Board on Research Integrity TENK (in Finnish, Tutkimuseettinen neuvottelukunta) guidelines (2019); see more detailed information in the separate sections below. Based on survey responses ($N = 65$), the project group designed playtest conditions to explore how three dyads of 8–12-year-old participants interacted when co-playing Minecraft (Mojang, 2009). We employ an extended view of playtests beyond testing a game for a smoother user experience; *playtests* in this case refers to the intended audience collaboratively testing particular game scenarios. Further, with *affordance*, we are here referring to certain game characteristics that can facilitate interaction and, thereby, language learning. Both datasets were analysed to discuss the affordances and conditions of in-game interaction and the potential for situated and reciprocal language learning in games.

LANGUAGE LEARNING IN AND THROUGH GAMES

Games have the potential to facilitate language learning (Brevik, 2019) and to develop and support competencies, such as communication and collaboration (Barr, 2019; Rusk & Ståhl, 2022; Rusk et al., 2021). Interaction and collaboration are central aspects of online gaming, in which new players are often socialized into the community through more experienced players (Rusk et al., 2021). The social dimension of playing together can be organized in different ways, for example, playing together online, as well as in parallel in the same physical space (Mustonen & Korhonen, 2020). However, the existing research on language learning in and through video games is somewhat fragmented. Previous research on language learning in games has primarily focused on games and literacy (e.g., Gee, 2007) or games as an engaging platform for vocabulary acquisition (e.g., Reynolds, 2017). In their systematic literature review, Acquah and Katz (2020) noted that most of the research on game-based second-language learning is mixed methods, focusing on English as a second language (L2) and conducted in Southeast Asia or the Middle East. One such example is the experimental study conducted by Chen et al. (2020), where two groups played a custom adventure game with English speech: one with subtitles solely in English (L2) and the other with additional Chinese glosses (L1, referring to one's first language). Although scripted and taking place between player and NPC (non-playable character), the dialogue was considered meaningful, and the additional glosses were seen as relevant support. Accordingly, we wished to explore the engaging potential of game-based second-language learning for creating authentic interaction situations, focusing on the reciprocal learning of languages other than English. The only previous example we have found of this is a study on game-based tandem language learning in virtual reality (Ahlers et al., 2022) with German as the target language. However, they focused on adult learners, resulting in a highly self-directed educational context.

In educational research, Minecraft (Mojang, 2009) is one of the games that has gained the most attention. For example, Wernholm (2021) explored five children's out-of-school learning in Minecraft (Mojang, 2009) through an adapted version of Wenger's (1998/2008) social theory of

learning. In their systematic review, Alawajee and Delafield-Butt (2021) synthesised 42 peer-reviewed studies on employing Minecraft (Mojang, 2009) in education published between 2014 and 2019. They found that the game supported increased motivation, language development, and academic learning. Further, in Minecraft (Mojang, 2009), “play also supported the development of social skills, including communication, sharing, collaboration and leadership” (Alawajee & Delafield-Butt, 2021, p. 19). Additionally, Alawajee and Delafield-Butt (2021) found that collaborative, rather than competitive, learning seems to be central when using Minecraft (Mojang, 2009) in a classroom context. One of the studies mentioned in the review is Cilauro’s (2015) work on Minecraft Gaming Day, arranged by the Melbourne Library Service, which showed that young people were keen to help less experienced players. Further, there was communication “between players within the game and then in person, across the room and over the tops of their screens . . . showcasing the variety of communication methods young people employ to engage with their peers and extended communities” (Cilauro, 2015, p. 91).

Although not explicitly discussed by Alawajee and Delafield-Butt (2021), most of the studies analysed in the systematic review discussing language learning appear to be centred on English as an L2, as noted by Acquah and Katz (2020). For example, in the study by Wernholm and Vigmo (2015), three young players documented their own gameplay in Minecraft (Mojang, 2009), and the players code-switched between Swedish (their L1) and English (L2). The dominating role of English in games and gaming contexts is one of the challenges we have previously identified for the reciprocal learning of other languages in-game (Hansell, Ståhl et al., 2022). This is based on the work of, for example, Brevik (2019), who noted a group of outliers that differed from their peers by performing well when reading and writing English, their L2, but displaying weaker language skills in their L1, Norwegian. Some of these students were highly engaged in authentic interactions in English through online games, and Brevik claimed that this spare-time engagement was connected to their high proficiency in their L2.

RESEARCH CONTEXT

This study was conducted in Finland, which is a bilingual country with both Finnish and Swedish as official languages, and all citizens are required to register one language as their *mother tongue*. Citizens with Finnish or Swedish as their registered mother tongue have equal rights to use and obtain services, including education, in that language (Boyd & Palviainen, 2015). Out of the population as a whole, in 2023, approximately 84.9% of the population had Finnish as their registered mother tongue, whereas 5.1% had Swedish (Official Statistics of Finland, 2024). The Finnish educational system is organised in parallel with Finnish and Swedish educational tracks, respectively, as the language of instruction and administration. Both language groups study the other national language as an obligatory school subject (Boyd & Palviainen, 2015), but Finnish is introduced earlier in the Swedish-medium schools (most often in Grade 1) than Swedish in the Finnish-medium schools (at latest in Grade 6). This difference in starting age entails challenges for cooperation between the language groups during the earlier years of education, which is the focus of the current study (see also Hansell, Pörn et al., 2022). Next, the research design and results of the pre-study (student survey) are presented and discussed, including how this informed the design of the laboratory study, which is then presented and discussed, and as explored in a later study, these results were later implemented in a classroom context (Hansell et al., 2025).

RECIPROCAL TANDEM LANGUAGE LEARNING

This study is part of a research and development project utilizing tandem language learning in cross-language educational collaborations between schools with different languages of instruction. Tandem language learning and instruction were first introduced in a German–French youth exchange in the 1960s (see Bechtel 2003, p. 20–22 for a detailed historical

overview). Tandem language learning is based on the idea of reciprocal collaboration between two students with different first languages (L1s) learning each other's languages in dyads through meaningful interaction (Elstermann, 2016; Karjalainen et al., 2013; Pörn & Hansell, 2019). In other words, the participants alternate between the roles of a learner and a language model and support (Hansell & Pörn, 2016; Karjalainen et al., 2013). Tandem language learning is based on a view of social interaction providing the groundwork for language learning (Pörn & Hansell, 2020), and it thus reflects a sociocultural perspective on (language) learning where the learning process is seen as socially situated, and learning takes place through interaction (e.g., Seedhouse & Walsh, 2010; Säljö, 2000).

Tandems have conventionally been organized among adult learners, where the participants are given great autonomy over the arrangements (Ahlers et al., 2022; Elstermann, 2016; Karjalainen, 2011). Formalizing tandems in a school context with younger students entails a more organized and formalized collaboration between both students and teachers with different language backgrounds (Pörn & Hansell, 2019, 2020; see also Holstein & Oomen-Welke, 2006). Central aspects of tandem language learning, in both formal and informal contexts, as well as physical (Bechtel, 2003; Holstein & Oomen-Welke, 2006; Pörn & Hansell, 2019, 2020) and virtual learning environments (Ahlers et al., 2022; Elstermann, 2016; Hansell et al., 2021; Hansell & Pörn, 2021), are reciprocity in learning and an active learner role and responsibility through (developing) autonomy, as well as facilitating interaction across language and cultural barriers.

In tandem language learning, the interaction between the tandem partners is meant to be authentic, in the sense that it builds on the tandem partners' wishes and needs to communicate with each other on content that they find relevant and interesting (Karjalainen et al., 2013). There are no regular language exercises, but the partners are allowed and encouraged to shift the focus from the content of the discussion to the language form and learning whenever needed (Karjalainen, 2011). The authentic need to interact in the target language is supported by the fact that the tandem partners do not share a common L1. However, as Elo and Pörn (2021) stated, merely the chance to interact with an L1 user of the target language does not make the interaction authentic. Especially in a formal school context with curriculum and teacher steering the topics discussed and tasks to be performed, authenticity cannot be taken for granted (Elo & Pörn, 2021). In this study, we focus on whether playing video games together could facilitate a need for, and interest in, a form of communication that could be used to create authentic needs and interest in language use and learning in tandem.

PRE-STUDY: RESEARCH DESIGN AND RESULTS

To gain a better understanding of the situated potential for in-game language learning as a pre-study, we conducted a student survey among four schools that volunteered to be part of the study. These schools are located in three different municipalities in Finland: one in the capital area, two in a smaller city, and one in a rural area. Two of the schools are Swedish-medium schools, and two are Finnish-medium schools, i.e., schools that have Swedish versus Finnish as the language of instruction and administration. All education providers granted us permission to conduct the survey. The students were, at the time of the questionnaire, in Grades 4–7 (9–14 years old). In total, there were 65 survey responses, with responses from all schools (see Table 1 for further details on the distribution). These schools formed language-mixed school pairs that employed tandem language learning to some extent prior to this survey, so tandem language learning was a familiar concept for the students. However, none of the respective teachers claimed to have used digital games as part of their tandem collaboration.

Table 1. Overview of the responses to the survey

School language	Swedish-medium 1	Swedish-medium 2	Finnish-medium 1	Finnish-medium 2
Grade	5	4–6	5	7
Responses	11	17 (Gr. 4: 4; Gr. 5: 6; Gr. 6: 7)	17	20
Total per language group	28		37	
Total	65			

Note. Gr. = Grade.

The student survey was digital and distributed to the students by their respective teachers. The background survey consisted of 14 questions and in addition to asking one background question (grade), the questions were centred around playing habits in terms of titles, types of games and devices, playing habits in terms of social aspects and their preferences and suggestions for playing games in a school context. Participation in the survey was voluntary, and written permission for the students to participate in the study was given by their guardians prior to the survey. The survey can be considered an opinion poll (Cohen et al., 2000) and consisted of both closed and open-ended questions. The main purpose of the survey was to map the playing habits of the students that would eventually participate in classroom tandem language learning through games (see Hansell et al., 2025). As discussed previously, authenticity is essential in tandem language learning as the context and content should align with the students' own thoughts and interests to be meaningful. Speaking to a person with another first language alone is not necessarily enough to facilitate an authentic interaction situation (Elo & Pörn, 2021). While the eventual learning design was created in collaboration with the teachers involved, at this stage, our focus was on the students' own perspectives. Apart from school and grade, the survey was anonymous. The responses cannot be linked to the participants individually, and the students were not asked to provide their gender identity. For an overview of the responses in relation to school, school year, and school language, see Table 1.

RESULTS: STUDENT BACKGROUND SURVEY

In this section, we present the most relevant results from the student survey, including the students' playing habits and preferences, their self-reported interactional habits and languages actualized in-game, as well as what games they would like to engage with in an educational context. The open-ended questions were analysed, focusing on highlighting the variation among the answers rather than forcing them into categories. Finally, the section concludes with a note of how the student surveys were used to design the playtesting sessions.

In terms of player motivation, the students were asked about their motivation to play games by choosing from several options. The most common motivation, chosen by over

two-thirds, was to play with friends ($N = 47, 72\%$), followed by to be challenged ($N = 34, 52\%$), winning ($N = 28, 43\%$) and building/creating ($N = 27, 42\%$) chosen just above or below half of the students. Almost one-third ($N = 20, 31\%$) responded that they play to learn new things, and no one responded that they do not play games.

In terms of in-game interaction, using either solely voice chat or a combination of voice- and text-based chat were the most common answers among the students, as approximately one-third chose these options ($N = 21, 32\%$). Somewhat fewer ($N = 18, 28\%$) indicated that they do not use voice chat in-game or that they do not know if they do. It is relevant to note that this question was posed to all students, not solely those who played multiplayer games. Therefore, some students might play games that do not offer or require any interaction between players. Furthermore, in this age group, gameplay is often regulated by parents (Kinnunen et al., 2022), so their access to chat functions might be limited.

In terms of languages the students encounter in-game, almost all the students ($N = 61, 94\%$) indicated that they came into contact with English. The question was intentionally posed in such a manner that both in-game content and interaction with other players could be included, as both are relevant to language learning. When split into language groups, these numbers remained high for both the Finnish ($N = 34/37, 92\%$) and Swedish-speaking students ($N = 27/28, 96\%$). The second most common language for both groups was their own: Finnish was mentioned by three-quarters of the students in the Finnish-medium school ($N = 27, 73\%$) and Swedish by two-thirds of the students in the Swedish-medium school ($N = 19, 68\%$). A slightly larger share of Swedish-medium students encountered Finnish in-game ($N = 5, 18\%$) than vice versa ($N = 4, 10\%$). From both groups, some ($N = 5, 8\%$) students also reported having encountered additional languages in-game, such as Estonian, Russian, and Spanish. Accordingly, English is the language most students encounter in-game, no matter their own L1, and the second most common language is their L1, no matter what language group they belong to.

When asked if there were any particular game(s) they would like to play in school, more than a third suggested their favorite games ($N = 24, 37\%$), and some mentioned games they were currently playing ($N = 5, 8\%$) or a combination of these ($N = 12, 18\%$). While a wide range of titles were mentioned, Roblox (2006; $N = 12, 18\%$), Minecraft (Mojang, 2009; $N = 9, 14\%$), and Fortnite (Epic Games, 2017; $N = 7, 11\%$) were the top three most suggested games. The students who suggested spare-time game genres indicated that they also found them appropriate for playing in school. They advocated for these games, for example, by stating that they include social aspects through the opportunity to play with and/or against others and that they are age-appropriate. For example, one student suggested *Roblox* (2006) and *Minecraft* (Mojang, 2009) and described the games as “educational and fun.” Further, there were some comments containing criticism of the current games used in school; for example, one student suggested “some mobile or computer games” as “we only play board games in school.” Finally, one student suggested *Valorant* (Riot Games, 2020), as they “liked the game, and it would be nice to have more friends there. For example, one can play with others there and chat over the mic. At the same time, one could learn languages/speak better, e.g., English,” thus including both social and learning aspects.

We also asked what kinds of game(s) the students would like to play together with a student from the other national language group. Almost half of the students ($N = 30, 46\%$) suggested their favourite game/and or the game they were currently playing, and a considerable share ($N = 27, 42\%$) was unable to suggest a game. On the other hand, one student mentioned *Minecraft* (Mojang, 2009) for the first time in this question. Although the question was simply to provide suggestions on such a game, a few of the students took this opportunity to offer their input on such an arrangement. For example, one student suggested a Finnish educational game for language learning for children “but that is, like, for 2–6-year-olds.” Two students also considered the language barrier: one of them (Finnish as L1) had certain suggestions they could play together “if they get English.” Another student with Finnish as L1 pointed out that they “had never played or heard of a game in Swedish; like, I know

they exist, but I have never heard of one.” Accordingly, these students were primarily focused on the language of the game, rather than on game mechanics suitable for interaction and language learning.

Based on these results, the project group deemed Minecraft (Mojang, 2009) to be one of the potential games to be implemented in a cross-language educational context. Minecraft is a continuously appreciated game in Finland (in the top 10 in the latest Finnish Player Barometer, see Kinnunen et al., 2024), and from the students’ perspective, it was among the games they saw as the most meaningful for language learning, thereby facilitating an authentic learning context. It is also a game that offers different language versions (including Finnish and Swedish) and has also previously been successfully employed in various educational contexts (for example, see Cilauro, 2015; McNally & de Andrade, 2022; Wernholm, 2021).

LABORATORY STUDY

Research Design and Results

The playtests were conducted with three dyads playing Minecraft (Mojang, 2009) together in a laboratory setting (cf. Majors & Ståhl, 2021; see Table 2 for an overview of the playtest setting and data). As mentioned earlier, we employ an extended view of playtests, referring to the intended audience collaboratively testing particular game scenarios. A laboratory setting was chosen at this initial stage to understand better the in-game interactions between participants without the environmental noise or technical challenges of the classroom. The equipment consisted of two computers (one desktop, one laptop) equipped with a mouse, keyboard, webcam, external monitor, and Xbox controller for each, as well as external speakers for the desktop computer. Both computers used Open Broadcaster Software to record screen and webcam feeds (which included audio). Two of the dyads played in the same room, and for them, a GoPro camera was also used to film the interaction (see Figure 1). One dyad played in separate rooms of the laboratory, and they used Microsoft Teams to communicate. There was also one researcher present in the room during the game (in both rooms, in the case of the dyad playing in separate rooms).

Figure 1. Laboratory setting where two of the participants sat next to each other and played with controllers



All students volunteered to participate in the playtests and received informed consent from their guardians. They were divided into three dyads by the researchers based on language skills, prior experience in playing Minecraft, and their schedules to find a suitable time for both partners to participate in the playtest. As the focus in this phase of the study was to understand the conditions and affordances for language use during collaborative playing, the dyads were planned so that the participants had a joint language, either the same L1—Swedish or Finnish—or one of them being bilingual, as presented in Table 2. This approach was chosen to understand what interaction between dyads within the intended age group might look like when a lack of language proficiency and a noisy classroom were not issues. Four of the participants were enrolled in the four schools that participated in the survey. Prior to that, two were recruited among the researchers’ personal networks, and this playtest functioned as a pilot. Two changes in the research design for the other two dyads were made based on the insights gained from the pilot: the difficulty setting was set to easy rather than medium, and the participants were able to keep the items in their inventory if their avatar died. However, the procedures as described below applied to all three dyads. The pilot data were still deemed relevant for the analysis of the playtest material as a whole and were therefore included in the analysis.

Table 2. Overview of playtest settings and data

	Pair 1		Pair 2		Pair 3	
ID in transcript	P1	P2	P3	P4	P5	P6
Gender	B	B	B	B	G	G
Age	10	8	12	11	10	10
L1	Swe	Swe-Fin	Swe-Fin	Fin	Swe	Swe
Game language/ Spoken language during playtest	Eng/Swe		Fin/Fin		Swe/Swe	
Game mode/Difficulty	Survival/Medium		Survival/Easy		Creative/Peaceful	
Seating arrangement	Same room		Same room		Different rooms	
Time (min:sec)	35:29		31:28		42:27	
Total time (h:min:sec)	1:49:24					

Note. P1 = Participant 1; P2 = Participant 2; P3 = Participant 3; P4 = Participant 4; B = boy; G = Girl; Swe = Swedish; Fin = Finnish.

The procedure was as follows. Each participant was welcomed to the laboratory together with their guardian and had access to refreshments before and after the playtesting session. Together with their guardians, the participants were informed of the research design and that they could quit the study at any time if they felt uncomfortable. After this, the participants were directed to the room(s) where the study was held and introduced to the researcher who administered the equipment. They were asked to take their designated seats and were given further instructions on how to proceed; then the recordings started. The dyads were asked to choose one of two tasks: finding certain animals in survival mode or a joint building project in creative mode. The facilitating researchers followed the interaction between the participants and made notes of situations that would be beneficial to follow up on in the individual interviews. None of the dyads stopped playing on their own accord; instead, the researchers asked them to stop when they deemed there was a natural pause around half an hour of

playing. After the participants were done, individual interviews were held in separate rooms. They were asked about their playing habits in general, how they found the test situation and playing as part of a dyad, how the situation varied from their usual setup, and whether they thought something similar could be implemented in a school context. After the interviews, the participants were led back to the reception room and their guardians, where they received a cinema ticket for their participation.

The datasets from this phase were then synchronized and transcribed, focusing on (a) the oral interaction, considering pauses, hesitations, and so on; (b) the participants' gaze, gestures, and use of artefacts; and (c) the in-game activity. The semi-structured interviews (Cote & Raz, 2015) were carried out individually, directly after the game tests in (one of) the participants' L1s. The length of the interviews varied between approximately 6–15 minutes, which made up approximately 58 minutes of interview material in total. The audio-recorded interview data were transcribed, focusing on verbally mediated content.

All four co-authors facilitated the playtests and/or the interviews, and while we changed roles, all took part in at least two playtests each. The playtest data were summarised by descriptive narratives of each playtest in order to get an overall picture of the dyads' interactions, as well as to identify patterns of interaction in them. Based on these, as well as the researchers' situated understanding of the material, this resulted in identifying three categories of interaction (presented below).

Laboratory Study Results

In this section, we present the results from the playtests in terms of the situated conditions and affordances for in-game interaction, divided into three categories. The first category, *Discussion about games and/or life in general*, implies interaction that is not directly connected to the current gaming situation but could rather be referred to as small talk. The category *In-game-focused interaction* is directly related to the game they are playing and the current situation and actions in the game. The last category, *Interaction Interrupted*, implies that something else, for example, technical problems, re-directed at least one part of the dyads' focus on something other than the interaction. By these categories, we intend to describe the situated conditions and affordances that we see as relevant for language learning. It is worth noting that this is not a descriptive mapping of all interactional practices that occurred during the playtests; rather, these examples highlight the patterns we see in the material at large. While several of these categories could be identified in one and the same dyad's interactions, there were also differences in how common the categories were in the different dyads' interactional patterns through the whole playtest. Appendix A presents a key to the markings in the transcriptions.

Discussions About Games and/or Life in General

Prior to the playtesting session, the first dyad discussed here, Participant 3 (P3; 12 years old) and Participant 4 (P4; 11 years old) had not met before. The playtest was organised in Finnish, as P3 is bilingual (Swedish-Finnish), and P4 has Finnish as his L1. They played in the same room, side by side. Together, they chose the task of finding animals in survival mode and played on the *easy* game difficulty setting. Both had played Minecraft (Mojang, 2009) before and were therefore able to start working on their task right away. They briefly discussed where P3 had previously seen a particular animal before and agreed to go there. As an overview of the dyads' interaction throughout the playtest, they were able to communicate around the task; however, apart from that, there were several silences. The longest silence lasted 29 seconds, but in addition to that, there were four instances where the silence lasted more than twenty seconds and multiple shorter ones. Silences were primarily broken by P3; he for example asked what kind of games P4 usually plays, upon which P4 answered that he mostly plays Fortnite (Epic Games, 2017). About eight minutes into the playtest, they started swimming (see Figure 2) and continued to do so throughout Excerpt 1 (see Figure 3). In this sequence, P3 asked P4 if he plays Minecraft (Mojang, 2009) often (line 1), and P4 responded that he plays it with his younger brother. Next, P3 asked what his brother is called (line 3) and what

P4 thought about the current YouTube content on Minecraft (Mojang, 2009), but then changed it to Fortnite (Epic Games, 2017; line 7), in line with P4's game habits.

Figure 2. Screenshot from *Minecraft* (survival mode; Mojang, 2009), from participant 3's in-game perspective, here combined with the synchronized video data of the participant



Figure 3. Excerpt 1: "What do you think about *Fortnite*?", Finnish (08:15–09:14)

- 1 P3 do you often play Minecraft
- 2 P4 well if my little brother plays Minecraft sometimes then I play with him
- 3 P3 ((P3 jumps into the water in Minecraft and is swimming straight ahead during the rest of this excerpt)) okay what is his name
- 4 P4 [name]
- 5 P3 ah ((glances over at P4s screen))
- 6 P4 ((glances over at P3s screen))
- 7 P3 what do you think about Minecraft or no no Fortnite em em (.) on Youtube what has been new this season ((P3s controller is disconnected, but he solves the issue himself by pulling out the chord and reattaching it))
- 8 P4 there has been some good stuff for Fortnite and (.) I don't really play Minecraft like-
- 9 P3 me neither really

Throughout the playtesting session, P3 posed several questions to fill the silences (the longest one was just under one minute). When asked about this, P3 explained that he felt awkward during the silences and thus tried to fill it. When asked about how often he talks when playing with his

friends at home, he replied, “Yeah, yeah, all the time: what we are doing, what we are up to, what we are going to do.” Interestingly, when P4 was asked about talking while playing, he said it was “alright, you kind of concentrate on both, alright (.) on the game at the same time as you talk about something.” The researcher followed by asking how he felt about P3 asking several questions on something else rather than the game they were playing, upon which P4 answered that “it was kind of natural or something.” Accordingly, both P3 and P4 found it possible to talk about other things while playing the game. However, P4 seemed more comfortable with silence in the conversation. It is possible that the low difficulty of the game, in combination with uneventful moments in the game (such as swimming in Excerpt 1), resulted in less cognitive load and meant that more cognitive resources could be allocated for conversation (Feldon, 2007).

In-Game-Focused Interaction

The second dyad, Participant 1 (P1; 10 years old) and Participant 2 (P2; 8 years old), also met for the first time during the playtest. Both attend a Swedish-speaking school, although P2 is bilingual (Swedish-Finnish), and they spoke Swedish during the playtest. They also played Minecraft (Mojang, 2009) in the same room, side by side, and chose the task of finding animals in survival mode, however, on medium difficulty. As an overview of the dyads’ interaction throughout the playtest, they are very engaged in their conversation and focused on their in-game task. The longest silence (32 seconds) took place around five minutes into the playtest, but after that, there were only two silences that lasted longer than a few seconds (8 and 13 seconds, respectively).

Regarding the in-game task, the two discussed what animals they could find where, what tools they would need to survive to get there, and what materials they would need for said tools. About 17 minutes into the playtest, during the night, as they discussed what type of fuel to use for their furnace, they are attacked by zombies (see Figure 4). P1 commented on the approaching zombies (Excerpt 2, line 3; see Figure 5), and P2 said that he was coming over and did so (line 4). P1 says that he was fighting zombies (line 5), upon which P2 exclaimed that he also wanted to be part of the fight (lines 6 and 8). They fought the zombies together and discussed what food they had and how helpful those particular types of food would be at the moment (lines 9–12). P2 spotted a skeleton and turned around back toward P1 (line 12) as P1 died, wondering how the zombie killed him in one hit (line 13). P2 said that it was probably due to P1’s low health that he was killed (line 14); P1 started commenting on that but interrupted himself and instead said that he now needed to find his way back to P2 (line 15). P2 kept fighting the enemies and collected some of P1’s things, while P1 made his way back to P2. They continued to fight the mobs and talk about where to go to find better food.

Figure 4. Screenshot from *Minecraft* (survival mode; Mojang, 2009), participant 2's in-game perspective, here combined with the synchronized video data of the participant



Figure 5. Excerpt 2: “How did that zombie one-hit me?”, Swedish (16:28–17:36)

1 P1 I'm taking one of these furnaces now (.) I am going to use
planks as fuel for the fire (.) I'll place it here
2 P2 yeah that is- that is the best
3 P1 okay there are two *zombies* coming here
4 P2 on my way ((moves towards P1 in-game))
5 P1 and I'm *fighting* them with- ((hits the zombies with a
sword))
6 P2 there are actually three incoming hey can I join in-
((starts hitting the zombies with an axe))
7 P1 okay
8 P2 I want in on killing them
9 P1 okay if not four (.) I need rotten flesh I have no food
10 P2 *the kelp* is on the way but it is not very good food (.)
((finishes off the last zombie)) one gets hungry
immediately and it only gives a half (.) food so
11 P1 ((eats rotten flesh)) and rotten flesh makes you hungry
but-
12 P2 yeah mm ((goes back towards his furnace)) (.) true (.) a
skeleton ((turns around and runs away past P1)) aaah (.)
nope
13 P1 ((dies in-game)) okay how did that zombie *one-hit* me
14 P2 well maybe because you had like one heart (.) if I remember
correctly
15 P1 now I have to- yeah I had there- I had gotten it up to- (.)
((glances over at P2's screen)) okay now I need to find
where you are (.) there

While this dyad is communicating throughout the playtest, they primarily discuss what is currently happening in the game. However, unlike P3 and P4, they played the survival mode on medium difficulty and did not get to keep their inventory when they died. When asked about the game, P2 did find it difficult at times, especially “when there were mobs everywhere and we had almost nothing.” Presumably, the more difficult setting offered them more of a challenge, and, in turn, the higher pace created less space for discussions beyond what was happening on their screen at that particular moment. Despite this, they were the dyad with the least and shortest silences in their communication (during their longest silence of 32 seconds, P2 glanced over at P1's screen several times). Thus, the high pace of the game seems to have created a need for continuous in-game-focused interaction.

The third dyad discussed here, Participant 5 (P5) and Participant 6 (P6; both 10 years old), were the only ones who knew each other prior to the playtests, as they attended the same school. They used their common L1 Swedish during the playtest. Unlike the other two dyads, they played in separate rooms, communicating over voice chat. As an overview of the dyads' interaction throughout the playtest, they communicated around their joined building project, but apart from that, the third dyad was the most silent of the three. The longest silence was 57 seconds, followed by silences of 56 and 44 seconds, respectively, and an additional 11 silences lasting longer than 20 seconds and multiple shorter ones. This dyad decided to undertake the joint building project in creative mode (Figure 6). Once they had found a spot that they both liked and agreed on what type of house they wanted, the building began. They divided the labour in such a way that P5 took responsibility for

constructing the house, whereas P6 focused on their kitchen garden, and they occasionally commented on what they did.

Figure 6. Screenshot from *Minecraft* (creative mode; Mojang, 2009), participant 5's in-game perspective, here combined with the synchronized video data of the participant



Almost 24 minutes into the playtest, while building the walls, P5 pointed out that she would soon start working on the roof (Excerpt 3, line 1; see Figure 7), P6 humming in response, and P5 suggests that she could build an attic (line 3), receiving another hum from P6 in response. Eventually, P6 commented that there was a pig looking at her (line 6), and P5 laughed in response. P6 pointed out that the pig is now following her (line 8), and P5 agreed and continued building. A highly amused P6 reiterates that the pig was, in fact, chasing her at this point, upon which P5 laughed in turn and continued building. Finally, P6 started talking to the pig (line 11), asking if it would like a carrot, and then offered the pig one. P6 commented that this was indeed what the pig wanted, and P5 commented that P6 had started feeding the pig.

Figure 7. Excerpt 3: "There is a pig watching me!", Swedish (23:49–24:53)

1 P5 this is the last layer after that I will start with the
roof (.) ((falls down)) oops ((flies up and continues
working on the wall)) (.) that is good because then it is
just to remove if one wants a window somewhere

2 P6 ((nods)) mm

3 P5 I know it will be- I was thinking I could make a small
attic on top

4 P6 mm ((nods))

5 P5 ((looks around on the walls from inside the house)) so
maybe something like this or something

6 P6 ((smiles)) for real there is a pig watching me

7 P5 ((laughs)) mm

8 P6 he is also following me

9 P5 ((sees P6 being chased by the pig outside the house)) I
know ((starts constructing the stairs to the attic))

8 P6 he is actually following me (.) he is chasing me the pig
((giggles))

10 P5 ((giggles and continues building stairs))

11 P6 I mean ((smiles)) (.) I think he wants carrots (.) do you
want carrot ((feeds the pig a carrot)) yeah he wanted
carrot

12 P5 are you feeding a pig now too ((smiles))

13 P6 mm

Throughout the playtest, P5 and P6 only discussed things that were directly connected to what happened on the screen. Further, they were the dyad with the most silences and the longest ones (the longest one spanning just over a minute). As this was the only dyad that knew each other from before, our presumption was that they would be the most talkative. However, when one of the researchers asked about it, "So, it was kind of silent at times when you played; does that usually happen when you two talk?" P5 simply said, "Yes." Additionally, she did not find the silence weird, nor did she think it was because they were in the laboratory. It is also worth mentioning that P6 commented that she had been nodding to P5's comments despite them not seeing each other and that they laughed about it together. Unlike what P3 experienced in Excerpt 1, it is, therefore, possible that co-playing with someone one knows has the affordance of perceived comfortable silences (echoing the work of Templeton et al., 2023). Furthermore, as there are no dangers in creative mode, the player can thereby control the pace of the game and, if they so want, constantly tinker with something.

Interaction Interrupted

The peer-to-peer interaction was interrupted during all three playtests. Primarily, there was a pause in interaction between the partners in the dyads when they were unsure of how to proceed, either because they had finished their task (e.g., P1 and P2 were unsure of different fish counted as different animals and asked the researchers) or if there were technical difficulties (e.g., P5 notifying a researcher that she was in survival mode rather than creative mode). However, the dyad that experienced the most technical difficulties was P3 and P4, as P3's controller kept disconnecting. When asked about whether something was a bad experience during the playtest, he pointed out that "it was kind of annoying with the controller, but otherwise no." However, after the first times the

researchers helped him, he started doing it himself instead of asking for help (see Excerpt 1, row 8), and as he stated in the interview, he “only unplugged the chord and plugged it again . . . and then we sat there and played, and it worked.” Despite this, the malfunctioning controller distracted him from the conversation, interrupted him when talking, and also resulted in his character dying. Accordingly, technical malfunctions, both in terms of software and hardware, can result in breaks in interactions. The fact that the participants turned to the researchers while being unsure about how to proceed (related to instructions) or when they were facing technical problems resembles the results reported by Hansell et al. (2021) on virtual tandems in a school context, where the students turned to the teachers in similar situations, thus interrupting their ongoing online communication with their tandem partner.

DISCUSSION

The aim of this paper is to explore the situated conditions and affordances for facilitating language learning through in-game interaction, as well as to discuss the educational implications of these conditions. In the following section, we return to the research questions (RQ1–RQ3) posed to the background survey as well as the playtest data. To understand these results in context, we discuss them in relation to (youth) game culture at large and the corresponding research. Finally, we conclude this paper with implications for in-game language learning in general and in the context of tandem language learning in particular.

In the first research question (RQ1), we inquired about students’ out-of-school gaming practices, particularly in terms of interaction, and how these might impact the potential for reciprocal language learning. The student survey showed that digital gaming was highly common in this group of students. As participating in the survey was voluntary, it is possible that the students interested in games were more inclined to fill out the survey. However, playing digital games is popular among Finns in general—the latest player barometer, by Kinnunen et al. (2024), shows that 81.1% of Finns play digital games at least occasionally—and among Finnish youth as well (Laakso et al., 2023), supporting the results of the background survey. Socializing with friends was the most common motivation for playing games, and in terms of in-game interaction, either solely voice chat or a combination of voice- and text-based chat were the most common answers among the students. Taken together, the results from the background survey highlight that multiplayer games such as Minecraft can be considered a meaningful context for authentic interaction and, thus, for language learning.

Although students were generally used to interacting in-game, it would be a risky assumption to presume that all students will kick off an in-game tandem language learning venture feeling comfortable interacting with a more unfamiliar person and in a language other than their L1. This is especially so with a target language being the second national language, Swedish or Finnish, that they do not usually use in-game. No matter their L1, the majority of all the students indicated that they primarily met English in-game, followed by their L1, as English is established as the lingua franca of games and gaming, and as most game-specific terminology is based on English words (Bergroth, 2009; Rusk & Ståhl, 2022), this was a result we had anticipated (Hansell, Ståhl et al., 2022). Accordingly, the high prevalence of English in an in-game context can be seen as a challenge for game-based learning of additional languages. However, this does not necessarily mean that the students will automatically use solely English when they communicate in-game. As Karjalainen et al. (2015) stated, students in other forms of tandem collaboration tend to prioritise tandem languages over English, which is used mostly in idiomatic expressions and occasionally as a support language for joint understanding. A similar pattern was observed in the current study. English was present in the playtests, but it did not dominate the conversations. Our intention going forward will be to foster a holistic view of multilingualism where all languages are used as resources instead of trying to keep them separate (see Baker & Wright, 2021).

Employing in-game tandem language learning requires that the gameplay experience is shared in some form, either through multiplayer or by playing in parallel, creating opportunities and a need for

interaction. Thus, the function of the game is to create a meaningful shared experience that stimulates interaction. In the student survey, apart from playing with friends, there were various responses to why the students played digital games and which games they preferred. Therefore, it would be highly difficult to find one game mechanic or even a game genre that would appeal to all students. One potential solution is to choose a game with multiple in-game modes and/or affordances—such as, for example, Minecraft (Mojang, 2009), which we employed here—and design varying tasks. Therefore, educators are posed with the balancing act of identifying games that students find authentic and thereby engaging enough to facilitate interaction while still being suitable in terms of the available devices and age recommendations. This echoes previous research on tandem language learning, suggesting that the younger the students, the larger the role of the teacher in steering the learning process (Hansell, Pörn et al., 2022; Hansell et al., 2021; Pörn & Hansell, 2020). We also wish to highlight that while in this context, Minecraft was deemed a relevant and thereby authentic game for the students to engage with, that might not be the case in all contexts, and there are other multiplayer games that might be more meaningful to employ as well. As such, we hope to see further empirical research on this topic from additional contexts.

The second research question (RQ2) focused on what themes could be identified in the discussions during the playtesting sessions. At large, we identified two major categories: either the participants were discussing what was happening in-game, or they were talking about life and games in general. This echoes the results of Wernholm and Vigmo (2015), who noticed that the in-game interactions and play were shaped by both previous knowledge of the game and other contexts. In terms of in-game focused discussions, this suggests that engaging in a joined game activity relieved the dyads from topic construction (Ahlers et al., 2022). As for the discussions on life and games in general, one of the dyads discussed game streams on YouTube, which is a relevant topic here, given that watching and sharing game streams is a central form of participation in the game culture (Laakso et al., 2023).

The third research question (RQ3) was how the in-game context and/or the chosen task affect interaction between the players. Given that authentic interaction is a core concept for tandem language learning (Karjalainen et al., 2013), the high levels of in-game interaction reported in the background survey were promising, as video games seem to create an authentic context for, and need to, interact. However, playing with student(s) from another school, speaking a different language, is not necessarily the same as playing with friends or even playing in (one of) your L1(s), as in the playtests in this study. However, having a common context and goal can facilitate meaningful interaction, which we later noted when conducting tandem language learning in games in a cross-language context (Hansell et al., 2025). As we have seen, knowing someone from before does not automatically equate to increased interaction; rather, it can lead to comfortable silences (Templeton et al., 2023), whereas not knowing each other can create possibilities for interaction through small-talk questions and answers.

CONCLUSIONS

As in-game communication and collaboration are complex activities, even among people who know each other from an offline context (Rusk & Ståhl, 2022), thinking that in-game interaction is a competency that all students have already mastered would be a risky assumption. For example, although they were experienced players and knew each other from before, one dyad noted that they were using body language that the other could not see. Therefore, the students need instructions and guidance in both the activity itself and in their roles in the tandem dyads, both using their target language and supporting their partner in their L1 (Hansell et al., 2021; Pörn & Hansell, 2020). This actualizes the teacher's role in choosing the games and activities, as well as instructing them so that they are pedagogically motivated. One of the participants found that talking in-game was fine as long as it was possible to do it at the same time as actively playing, suggesting that he found the game to be the primary activity. This was also echoed among student survey results highlighting 'winning' as a motivation for playing digital games. Here, we wish to point out that the game

community at large is centred on the concept of competence (e.g., Harper, 2013). Therefore, it is worth considering how to handle competition so that the student with a higher level of in-game skills is not the one dictating the learning experience. This is even more important in mixed-language dyads if the student who is more competent in the game is using their L1. As Hansell and Pörn (2016) have pointed out, if the same partner is an expert in both language and content, it can have a negative effect on reciprocity in tandem collaboration. Accordingly, the pace and difficulty of the game should be taken into consideration so that they align with the learning goal the educator has in mind.

One aspect we did not come across in the playtests but is highly present in game culture at large is in-game toxicity. Previous research among Finnish youth suggests that this is also the case in Finland (Meriläinen & Ruotsalainen, 2022), echoed by one survey response that recommended a game because the community was not “horribly mean.” As tandem language learning is intended to foster tolerance across language and cultural borders, we argue that employing this model for language learning could support constructive in-game communication. While toxic language use is indeed a challenge for language education fostering inclusion, it can also be seen as an opportunity to potentially change the game community from within (Ståhl & Rusk, 2020).

While this study did not offer a tested educational design, the implications of this study help shape the reciprocal language learning design for classroom contexts with students with different languages as L1 that we later did in collaboration with teachers (Hansell et al., 2025). Based on the playtests, we could provide the teachers with empirical examples of how the different modes and difficulty levels would impact the student interaction. For example, the pace of low difficulty or creative mode offers the students the opportunity to get to know each other and ask each other questions while simultaneously working on a task together. However, low intensity in terms of game mode and difficulty can also result in longer silences, especially if participants feel comfortable with silence. Survival mode, especially with a harder difficulty level, on the other hand, does not offer the students time to explore other non-related topics. However, survival mode requires that the students work together and prompts quick interaction, which might be helpful to encourage students to communicate with each other without worrying about exactly how to phrase something. Accordingly, the pace and difficulty of the game should be taken into consideration so that they align with the learning goal the educator has in mind.

While engaging in a joined activity in game, the game context in combination with the task relieved the participants from the pressure of topic construction (see Ahlers et al., 2022). The task the students are given within the game is also connected to what vocabulary will be used and practiced. For example, when gathering something in-game, we saw that names of plants and animals can be relevant, whereas when building something, words for materials and colours will be needed. Through using different game modes, difficulty levels, and a variety of tasks, the teacher can utilize multiple affordances for language learning in and through games.

COMPETING INTERESTS

The authors of this publication declare there are no competing interest

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APPENDIX

Table A1. Transcription key

Marking	Meaning
(.)	pause
text-	cut-off or self-interrupted talk
text	talk in Swedish or Finnish as main language of the transcript
text	talk in English
((text))	non-verbal or embodied activity
text	stress or emphasis
[text]	censored name

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