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Lighting the fuse for interaction and negotiation: The potential of information-gap digital puzzle games for language learning



MICHAEL HOFMEYR

Osaka University, Japan
mfhofmeyr@gmail.com

Abstract

While the existing CALL literature identifies a range of positive learning outcomes for second language acquisition (SLA) that may be achieved through digital game-based activities, Peterson (2013) points to the need for additional theory-led research to shed more light on the learning processes involved. To this end, a case study was carried out in which three upper-intermediate-level learners of English at a Japanese university played the cooperative puzzle game *Keep Talking and Nobody Explodes* (2015) over four sessions. A three-tiered interaction analysis was performed on the learners' linguistic output in order to identify instances of negotiation for meaning and associated interactional strategies theorised to benefit learning within the cognitive-interactionist SLA paradigm. The findings confirm that negotiation for meaning occurred and suggest that breakdowns in communication resulting from vague language usage or from gaps in lexical knowledge are most likely to elicit beneficial forms of negotiation. In addition, learners are shown to have made regular use of various interactional strategies, either to repair breakdowns in communication or to pre-empt such breakdowns. Clarification requests and elaborations on previous utterances are shown to have occurred during interaction and the data suggest that these two strategies can involve substantial modified output that may further facilitate SLA.

Keywords: cognitive-interactionist SLA, digital game-based language learning (DGBLL), interactional strategies, negotiation for meaning

Introduction

Digital game-based language learning

A growing body of research in digital game-based language learning (DGBLL) has drawn attention

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to the educational potential of entertainment-focussed games, also referred to in the literature as vernacular games (Sykes & Reinhardt, 2013) or commercial off-the-shelf games (Sundqvist, 2019; Van Eck, 2009). These games are designed primarily to entertain players rather than to serve any specific educational purpose.

The learning that occurs through such games tend to be of an unstructured and incidental nature, and may require supplementary pedagogical activities for effective integration into formal language courses (Whitton, 2014). However, the substantial resources and expertise available to many studios that make entertainment-focussed games today, along with a strong commercial incentive to produce games that are highly engaging (Prensky, 2001), mean that learners may find many of these games to be more enjoyable to play than their deliberately educational counterparts (Van Eck, 2009).

The potential of cooperative puzzle games

Entertainment-focussed games span a wide variety of genres that feature different game mechanics (Reinhardt, 2019) and that have the potential to facilitate SLA in various ways (Peterson, 2013). A number of recent studies point to the possible learning benefits of cooperative asymmetrical puzzle games, an emergent subgenre where players or groups of players each have access to separate sets of information which they must effectively exchange with each other in order to successfully complete in-game goals. This game mechanic closely resembles the information-gap (Nunan, 2012) or jigsaw task (Willis & Willis, 2007), a staple of the task-based language teaching approach that is widely used to elicit spoken interaction from learners in a communicative classroom setting. It therefore seems reasonable to assume that games making use of this mechanic would elicit similarly beneficial interactions between learners in a game-based language learning context.

Cardoso, Grimshaw, and Waddington (2015) conducted a pilot study in which ten Chinese university students enrolled in an English language programme at a Canadian university played the mobile game *Spaceteam ESL*, a modified version of the asymmetrical puzzle game *Spaceteam*, over several sessions. Based on student and teacher perceptions, the authors conclude that the game holds the potential to help develop learners' oral fluency and pronunciation in their second or foreign language (L2). In addition, increased levels of motivation and peer feedback between learners are also reported. In a subsequent experimental study by Grimshaw and Cardoso (2018), 20 university-aged learners of English played the same game over six sessions spanning a six-week period. The findings again suggest that the play sessions helped to improve these learners' overall oral fluency as well as their willingness to communicate due to reduced anxiety.

Another asymmetrical puzzle game that has received attention in the literature is *Keep Talking and Nobody Explodes*. Dormer, Cacali, and Senna (2017) incorporated this game into their own English language courses at a Japanese university and then surveyed 209 of the participating students about the experience. The vast majority of respondents reported that they had enjoyed playing the game and felt that the game-based activities had been helpful for improving their general English language development, while a smaller majority considered the language skills that they developed through the game to be relevant to their science and technology subject areas.

A further study was conducted by Wilson (2019), who integrated *Keep Talking and Nobody Explodes* into a reading skills course at the same Japanese university and then asked 87 student respondents to compare the game-based learning activities to more traditional classroom activities such as text reconstruction exercises. The learners indicated high levels of engagement during the game-based activity and also rated this activity as being more beneficial for the development of their English reading and speaking skills than the traditional classroom activities. Moreover, the author notes that

the game can be integrated into an educational setting with comparative ease, which addresses the perennial concern of the feasibility of implementing game-based learning into formal language education programmes (Swier & Peterson, 2018). On the other hand, he also cautions that the information-gap game mechanic and time pressure present during play can incentivise some learners to minimise their language production, which may limit gains in SLA.

Rationale and research questions

While the existing literature suggests that cooperative digital puzzle games involving an information-gap game mechanic may be effective tools for motivating language learners, for eliciting substantial meaning-focussed interaction, and for improving oral fluency, they reveal little about if and how language learning actually occurs during play. Indeed, the lack of a solid grounding in well-established theories of SLA has been identified as one of the enduring problems of CALL research in general (Chapelle, 1997). Peterson (2013, p. xv) argues that the same trend holds true for studies in DGBLL and calls for more “systematic theory-led research that recognizes both the potential benefits and issues associated with the use of computer games in CALL.”

The current study aims to contribute to the existing literature by investigating if and how the cooperative digital puzzle game *Keep Talking and Nobody Explodes* may facilitate SLA. Theoretical constructs from a cognitive-interactionist SLA framework are employed to analyse spoken interaction between learners over several play sessions, with a specific focus on negotiation for meaning and related interactional strategies employed by the learners. Previous studies (Peterson, 2006, 2010; Toyoda & Harrison, 2002) have produced evidence of negotiation for meaning in learner-to-learner interaction during computer-mediated communication in the settings of an online virtual world and massively multiplayer online role-playing games. However, the current study will be the first to focus on negotiation and associated interactional strategies occurring during spoken face-to-face game-based interaction. This is significant because activities of this nature can be relatively easily integrated into a foreign language classroom setting, as they require no Internet connection nor any external participants.

In light of the above, the study seeks to answer the following four research questions:

- 1) Does negotiation for meaning occur spontaneously in spoken learner-to-learner interaction during a digital game-based information-gap activity?
- 2) If so, how may such negotiation facilitate SLA?
- 3) Do learners spontaneously make use of interactional strategies associated with negotiation for meaning during a digital game-based information-gap activity?
- 4) If so, how may such interactional strategies facilitate SLA?

Relevant theoretical constructs from the cognitive-interactionist SLA framework

The cognitive-interactionist model posits that learners develop their knowledge of a target L2 by means of spoken or written interaction with L1 or other L2 speakers of that language. As a result, the importance of ample comprehensible linguistic input (Krashen, 1982) and output (Swain, 1985) is heavily stressed. A key interactional mechanism by which language learning is hypothesised to take place is the negotiation for meaning (Gass & Varonis, 1985; Long, 1996, 2015). This term is generally understood as the process by which two or more interlocutors attempt to repair a breakdown in communication by using a variety of interactional strategies to allow for an interlocutor’s intended meaning to be successfully conveyed (Loewen & Reinders, 2011). However, some SLA theorists use the term more broadly to refer to an ongoing process through which the interlocutors “strive to make meaning more comprehensible for each other” (Ortega, 2009, p. 61). In

this more inclusive conception, an interactional strategy that does not follow a breakdown in communication may be interpreted as a strategy intended to pre-empt a potential breakdown by maximising comprehensibility of output.

Long (1996, p. 418) provides the following similarly inclusive definition of negotiation for meaning:

the process in which, in an effort to communicate, learners and competent speakers provide and interpret signals of their own and their interlocutor's perceived comprehension, thus provoking adjustments to linguistic form, conversational structure, message content, or all three, until an acceptable level of understanding is achieved.

These signals and adjustments may take the form of implicit feedback (Sheen & Ellis, 2011) and modified output (Sheen, 2008). Feedback from interlocutors during interaction is hypothesised to facilitate SLA by drawing learners' attention to incorrect L2 usage (Gass, 2018), that is to say elements in their interlanguage that result in or threaten to disrupt effective communication. Schmidt (1995; 2001) argues that such feedback helps learners to notice and effectively address gaps in their L2 linguistic competence.

Although various typologies and constructs have been proposed by interactionist SLA researchers to conceptualise negotiation for meaning, three forms of feedback are traditionally identified in research on negotiation (Gass & Mackey, 2020). These types of feedback, also referred to as interactional strategies (Ellis, 2008), are confirmation checks, clarification requests, and comprehension checks. Ellis (2008, p. 227) defines a confirmation check as "an utterance immediately following the previous speaker's utterance intended to confirm that the utterance was understood," typically taking the form of a full or partial repetition of the utterance. The same author defines a clarification request as "an utterance that elicits clarification of the preceding utterance," for example by asking "What?" Finally, a comprehension check is an utterance used by a speaker to confirm that their interlocutor has understood their preceding utterance, for example by asking "Do you want me to repeat?" (Gass, Mackey & Ross-Feldman, 2005, 2011).

While feedback itself may result in SLA through the processes described above, it may also constitute or elicit repeated or modified output from interlocutors. This aspect of interaction holds the potential to further reinforce L2 knowledge and to facilitate SLA by encouraging learners to produce more accurate and intelligible output in the target language (Swain, 2005), particularly when this involves elaboration on earlier output (Gass & Varonis, 1985).

Methodology

Participants and game-based task

A case study group of three undergraduate students at a national university in Japan participated in four play sessions of approximately one hour each. The group consisted of one male and two female learners, all specialising in English Studies and possessing an intermediate level or higher of English proficiency. Two of the learners, Kazu and Yuki, were L1 speakers of Japanese and the third learner, Lijuan, was an international student who spoke Mandarin Chinese as an L1.¹

The learners used a laptop computer to play the game *Keep Talking and Nobody Explodes*, in which the goal is for players to work together to disarm a bomb before a countdown timer reaches zero. Each bomb consists of multiple procedurally generated puzzle modules that change from one defusal attempt to the next. There are eleven different module types in total, each involving a different kind

of information-gap puzzle. In early bombs, only the simpler module types appear, with more challenging module types being gradually introduced as the game progresses. One player, the defuser, sees the bomb on the computer screen (see Figure 1) and describes it to the other two players, the experts, who have access to the Bomb Defusal Manual (see Figure 2). The experts cannot see the bomb and must consult the manual for instructions on how to solve each module, which they must then relay to the defuser. During each play session, learners were instructed to change roles three times, giving each of them a turn to play the role of defuser for one third of the session's duration.



Figure 1 *Example bomb consisting of a timer and three puzzle modules on the front face*

Data recording and analysis

Video and audio recordings were made of all learner interactions over the four play sessions, during which learners were instructed to speak only in English. Apart from a short initial orientation by the researcher on the game controls, no assistance was provided to learners except on the few occasions when they specifically requested advice. A total of just under four hours' worth of recordings were transcribed and an interaction analysis was carried out using a limited coding scheme (McKay, 2006) to quantify instances and identify noteworthy examples of negotiation for meaning and related interactional strategies theorised to facilitate SLA within the cognitive-interactionist framework.

The coding scheme consists of three partially overlapping tiers of analysis designed to complement one another and thereby provide a more holistic picture of negotiation during play. The first analytical tier identifies all clear-cut cases of negotiation for meaning in the transcripts. For this part of the analysis, negotiation is understood in the narrow sense, namely a breakdown in communication caused by some deficiency in an interlocutor's L2 competence followed by one or more verbal attempts to repair this breakdown. The relatively frequent breakdowns in communication that occurred due to confusion resulting from unfamiliar game challenges are not included here, nor are cases where only gestures are used in repair attempts. Each clear-cut case of negotiation for meaning was marked as successfully repaired or not and the cause of the breakdown was also noted.

On the Subject of Mazes

This seems to be some kind of maze, probably stolen off of a restaurant placemat.

- Find the maze with matching circular markings.
- The defuser must navigate the white light to the red triangle using the arrow buttons.
- **Warning:** Do not cross the lines shown in the maze. These lines are invisible on the bomb.

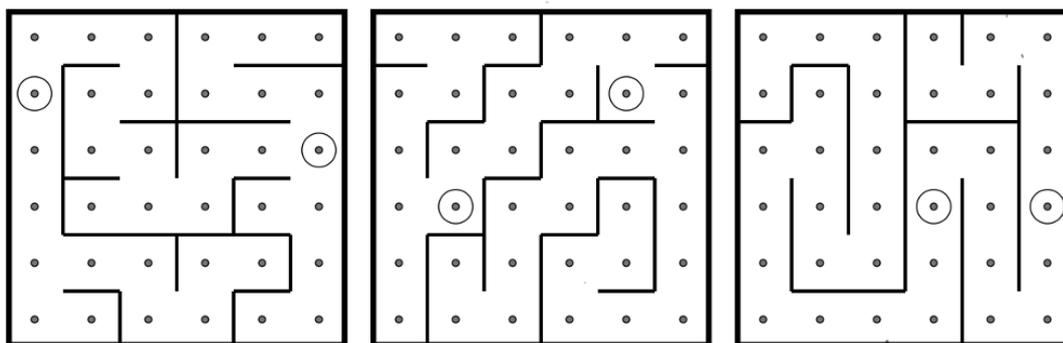
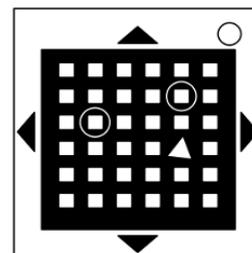


Figure 2 Example instructions from the Bomb Defusal Manual

The second tier of the analysis identifies all cases of the three interactional strategies most commonly employed for coding negotiation for meaning: confirmation checks, clarification requests, and comprehension checks. A broader conception of negotiation is adopted at this stage in the analysis, so as to include cases where the strategies occur even when no apparent breakdown in communication is evident. In these cases, the strategies are assumed to serve not to repair breakdowns, but instead to pre-empt them. Again, utterances signalling incomprehension were only counted as clarification requests in cases where the confusion stemmed from limitations in an interlocutor's L2 competence, as opposed to difficulties in solving the game tasks. Furthermore, since the interaction involved three interlocutors playing the two roles of expert and defuser, the two experts were treated as one interlocutor in quantifying interactional strategies. For example, when both experts repeat the defuser's utterance to confirm that they have understood correctly, this is counted as one instance of a confirmation check.

While the first two tiers of analysis cover a substantial portion of the negotiation for meaning and associated interactional strategies used by learners during the sessions, a significant number of their utterances that were seemingly intended to repair or pre-empt breakdowns in communication do not fit well within the coding scheme described above. In order to account for these additional strategies that may be particularly prevalent in the Japanese educational context, an inductive analytical approach (Johnson & Christensen, 2017) was designed based on the researcher's own observations of learner behaviour, thus adding a third tier to the analysis. In this part of the study, all cases of learners repeating or modifying their own utterances or those of their interlocutors are identified. Modified sentences are classified as paraphrased sentences or approximately synonymous words, where the meaning of the modified output remains similar to that of the original output, or as elaborated or simplified output, which involves additional meaning or more limited meaning respectively. Repetition of words that carry very little independent meaning, for example backchannelling words such as *okay* and isolated function words such as *and*, are omitted from the count. As in the

second-tier analysis, the two learners playing together in the role of expert are considered as one interlocutor for the purposes of quantifying interactional strategies.

To test the internal reliability of the coding scheme (McKay, 2006) at all three tiers of analysis, a second rater was asked to independently code a representative sample of 40 interactional extracts using the categorisation system laid out above. A comparison of the second rater's results with those of the author indicates an inter-rater reliability of .875, signifying strong overall agreement. The reliability of the analysis is further strengthened by the fact that all of the points of disagreement between the second rater and the author could be resolved through discussion, in which the author provided additional relevant context for each interaction.

Limitations

“Qualitative research is uniquely capable of documenting and analysing the situated, contextual influences on language acquisition and use” (Dörnyei, 2007, p. 154) and case studies have been identified as particularly important in the field of CALL (Van Lier, 2005). However, the time-intensive nature of the interaction analysis approach severely limited the number of participants and the amount of learner output that could be included in this study. While the findings presented here can provide helpful insights into the strategies that learners may employ to negotiate for meaning during digital game-based interaction involving information-gap tasks, these results cannot be generalised to make any conclusive claims about the interactional behaviour of language learners in general, either in Japan or elsewhere. Likewise, the number of negotiation episodes and instances of interactional strategies identified are too limited to allow for any definitive conclusions to be drawn at this stage. Further quantitative or mixed-methods research involving larger and more diverse groups of learners will thus be necessary in order to confirm the patterns in game-based learner interaction and their associated benefits to SLA identified in this study.

Results

Overview of learner output

Over the four play sessions, the group of learners attempted to solve 166 puzzle modules appearing on 52 bombs, 24 of which they successfully disarmed. While the sessions sometimes involved lively and fast-paced spoken interaction between learners and at other times included extended periods of silence as learners considered a particularly challenging module or consulted the manual, a large amount of spoken output was produced in total. This finding supports the conclusions of earlier studies that information-gap puzzle games can increase willingness to communicate (Grimshaw and Cardoso, 2018) and learner engagement (Wilson, 2019). Learners uttered a total of more than 17,000 words spanning almost 5,000 turns over the four sessions, averaging approximately 75 words per minute. Most utterances were short, often consisting of only a single word. For example, at 1,152 occurrences, *okay* was the word most frequently uttered and other backchannelling expressions such as *yes* and *uh-huh* also occurred very often.

As the game-based interaction took place between three learners who were under constant time pressure, the learners often interrupted each other and much of their output occurred in an abbreviated style rather than in full grammatical sentences. Learners tended to produce longer, more complex, and less repetitive utterances when dealing with a new type of puzzle module and to then gradually adopt a shortened and more formulaic style once the module had become more familiar and key points to be communicated had been identified. This finding corroborates Wilson's (2019) observation that some learner participants playing the same game in his study used only minimal

language, limiting the potential for new SLA gains.

Table 1 *Summary of learner output*

	Session 1	Session 2	Session 3	Session 4	Total
Duration	52:12	66:07	67:00	45:15	3:50:34
Word count	3,477	4,994	5,270	3,531	17,272
Word rate	66.61 wpm	75.53 wpm	78.66 wpm	78.03 wpm	74.91 wpm
Turn count	702	1,544	1,521	1,100	4,867
Turn rate	13.45 tpm	23.35 tpm	22.7 tpm	24.31 tpm	21.11 tpm
Bomb count	11	15	16	10	52
Module count	31	56	51	28	166

Negotiation for meaning

A total of 51 episodes of negotiation for meaning were identified in learner interaction over the four sessions. In the vast majority of these cases, 47 in total, the negotiation resulted in successful repair of communication. In three further cases, it was not clear whether the breakdown was repaired and in only one case was it evident that the breakdown persisted in spite of multiple repair attempts.

Breakdowns in communication that initiated the episodes of negotiation were triggered by a range of different causes. In 17 of the negotiation episodes identified, the breakdown was caused by one learner simply mishearing what another learner had said, as in the following example.²

Interaction 1 *Example of negotiation episode caused by mishearing*

- Yuki (D)³ And triangle is second from the right and third from the bottom.
 Lijuan (E) Second from the *left* and, a
 Kazu (E) Second from the right. Hmm?
 Yuki (D) Right, right.
 Lijuan (E) Second from the right.

In nine other negotiation episodes, a temporary breakdown in communication occurred due to word ambiguity. All of these episodes took place while learners were attempting to solve a module of the Who's on First type, which is designed to cause confusion and miscommunication among players by requiring them to distinguish between spoken sets of homonyms and similar-sounding words.

Interaction 2 *Example of negotiation episode caused by an ambiguous word*

- Kazu (E) You.
 Yuki (E) You.
 Lijuan (D) Uh, *alphabet U*? (draws letter in the air)
 Yuki (E) No no no no. Y-O-U.
 Kazu (E) No no no no. You. (points finger at Lijuan)

The above examples illustrate how learners are able to creatively draw on their linguistic and non-linguistic resources to effectively repair breakdowns in communication. However, the modified

output that the learners produced during the episodes of negotiation that resulted from mishearing or from ambiguous word usage tended to not be very substantial in terms of quantity nor did this output involve much lexical or syntactic complexity or variety. Furthermore, there is little evidence to suggest that the learners' attention was drawn through these episodes to gaps in their L2 linguistic competence.

Some negotiation episodes that were triggered by other causes resulted in richer output. These include ten episodes where a breakdown was caused by vagueness or lack of sufficient detail in an utterance and four episodes where communication broke down due to a listener's lack of familiarity with a lexical item crucial to the meaning of an utterance. The following examples illustrate how negotiation proceeded after such breakdowns.

Interaction 3 *First example of negotiation episode caused by vague language*

- Lijuan (E) So, how does the countdown timer looks like now? So
 Yuki (D) So, in the
 Lijuan (E) Is there a one in it?
 Yuki (D) One, one, one, one, *one timer*. And the
 Lijuan (E) I mean, yah, I mean, the numbers on the timer. Is there a one?
 Number one?
 Yuki (D) Number one?
 Lijuan (E) So, it's like zero, four, dot-dot, five one.
 Yuki (D) Ah, yes. Zero, two, uh, zero, one, dot-dot, five, five.

In the exchange above, the two experts need to know whether the digit one appears anywhere on the bomb's countdown timer display (see Figure 3). Lijuan attempts to ask for this information in two different ways, but the first is too vague and Yuki's inappropriate answer to her second question reveals that Lijuan needs to reformulate her question further in order to make herself understood. She ultimately succeeds in repairing the breakdown by elaborating on her original utterance with more detailed information, repeating and paraphrasing her question, and providing a concrete example of the kind of answer that she needs in order to solve the module.



Figure 3 *Countdown timer display on bomb*

Interaction 4 *Example of negotiation episode caused by lexical gap*

- Kazu (E) Three. (to Yuki) Three is odd?
 Yuki (E) *Wakaran.* [I don't know.] Hmm? What is odd?
 Kazu (E) Odd. Odd number, is
 Lijuan (D) Odd number is, like one, three.
 Kazu (E) One, three.
 Yuki (E) Ah, okay.

Lack of familiarity with a lexical item may also trigger a negotiation episode, as the above interaction illustrates. Here, the experts need to determine whether the final digit in a serial number is even or odd in order to disarm a bomb module. Kazu learns that the final digit is three, but he is not certain whether this is an odd number or not. He asks Yuki, who reveals that she does not know the meaning of the word in this context either. Lijuan then defines the term by giving one and three as examples of odd numbers. Both Kazu and Yuki signal their understanding and the learners proceed to successfully disarm the module. While it is not certain that Kazu and Yuki have now acquired a clear understanding of the word *odd* in this context, the interaction will have made them aware of this particular gap in their L2 lexicon.

As can be seen in the examples of negotiation episodes presented here, not all breakdowns in communication lead to rich and modified output. Over half of all the negotiation episodes identified over the four play sessions were triggered when a learner misheard an interlocutor or when learners failed to notice ambiguity in similar-sounding word sets that formed part of a deliberately confusing puzzle module. Since no more than minimal language output was usually required to repair such breakdowns, negotiation episodes in these cases seem unlikely to substantially benefit SLA. On the other hand, the remaining examples suggest that learners may benefit more from negotiation episodes triggered by vague language usage or by a learner's lack of familiarity with key lexical items. In the case of the former, SLA may occur as a result of rich and modified output production, including elaborations. In the latter case, negotiation may lead learners to acquire new lexis or to become aware of lexical gaps.

Table 2 *Summary of negotiation episodes and their causes (analysis tier 1)*

	Session 1	Session 2	Session 3	Session 4	Total
Negotiation episode count	9	13	16	13	51
Cause 1: mishearing	1	4	4	8	17
Cause 2: ambiguous word	0	0	7	2	9
Cause 3: vague language	4	3	2	1	10
Cause 4: lexical gap	2	1	0	1	4
Other causes	2	5	3	1	11

Interactional strategies: Confirmation checks, clarification requests, and comprehension checks

A total of 1,013 confirmation checks were identified over the four play sessions, which amounts to an average rate of approximately one instance for every 14 seconds of interaction. The information-gap game mechanic at least partly accounts for this high rate of occurrence, as learners needed to exchange large amounts of information with each other quickly and accurately in order to

solve the puzzle modules. Frequent confirmation checks, such as those appearing in the interactional extracts below, helped learners to ensure that they had heard and understood an interlocutor correctly.⁴

Interaction 5 *Examples of confirmation checks to verify correct hearing*

- Lijuan (D) There are four wires.
 Kazu (E) **Four wires.**
 Yuki (E) **Four wires.**
 Lijuan (D) Four. Red.
 Yuki (E) **Red.**
 Lijuan (D) White.
 Yuki (E) **White.**
 Lijuan (D) Red.
 Yuki (E) **Red.**
 Lijuan (D) Black.
 Yuki (E) **Black.**

Interaction 6 *Example of confirmation check to verify correct understanding*

- Yuki (D) And second [module on this bomb] is, like, um, squares and circles and triangle.
 Lijuan (E) Oh, **the maze thing, right?**
 Yuki (D) Yes.

Most of the confirmation checks identified in the interaction involved a learner simply repeating an interlocutor's utterance, for example to verify that they have correctly heard sequences of colours, numbers, or letters. Except for cases in which the repeated word had not yet been fully acquired by the learner, such confirmation checks were unlikely to facilitate SLA in any substantial way. This is because they involved little or no modified L2 output by the learner who checked and typically elicited no further response from that learner's interlocutor except in the few cases where the learner did in fact mishear part of the utterance. Even then, the resulting breakdown was quickly resolved using minimal language, as discussed in the previous section of this paper.

It is interesting to note that, out of the 1,013 confirmation checks identified, only 72 instances occurred within the negotiation episodes identified in tier one of the analysis, equal to approximately 7.1% of the total. In the vast majority of cases, therefore, confirmation checks seem to have been used as an interactional strategy to prevent the breakdown of communication in the first place, as opposed to repairing a breakdown that had already taken place.

Clarification requests occurred comparatively seldom during the play sessions, with 35 instances of this interactional strategy identified in the transcripts. In contrast to the confirmation checks, 25 of these cases, or approximately 71.4% of the total, occurred during negotiation episodes. Some, as in the example below, elicited significant additional output from the interlocutor to whom the request was directed.

Interaction 7 *Example of clarification request eliciting significant linguistic output*

- Lijuan (E) Oh yeah. Okay, you now have to see the LED fla, how it flash.
 Kazu (D) **How?**

- Lijuan (E) How it flash.
 Yuki (E) Yah. So
 Lijuan (E) So, there, so, a short flash, when there is a short flash, and there is a long flash. And there is, uh, so, so you basically are seeing the Morse code right now. You know, Morse code is like dot and, uh.
 Yuki (E) Ah, yah. Morse.

The third interactional strategy, the comprehension check, was hardly used at all by learners during the play sessions. A total of only four instances were identified in the transcripts, and in each case involved the same learner, Lijuan, uttering the word *okay* to gauge her interlocutor's comprehension of her preceding utterance, as in the example below. In neither this nor any of the other instances did the comprehension check elicit substantial linguistic output from either of the other two learners.

Interaction 8 *Example of comprehension check*

- Lijuan (D) So, the white square
 Yuki (E) Hmm.
 Lijuan (D) Is, uh, fourth from the left
 Yuki (E) Hmm.
 Lijuan (D) And third from the top.
 Yuki (E) Okay. Okay.
 Lijuan (D) ***Fourth, okay?***
 Kazu (E) Okay.

Table 3 *Summary of interactional strategies (analysis tier 2)*

Interactional strategy	Session 1	Session 2	Session 3	Session 4	Total
Confirmation check count	121 (9) ⁵	349 (21)	335 (23)	208 (19)	1,013 (72)
Clarification request count	13 (7)	9 (6)	8 (8)	6 (4)	35 (25)
Comprehension check count	2 (0)	0 (0)	2 (0)	0 (0)	4 (0)

Interactional strategies: Repetition and modified output

Over the four play sessions, one of the more conspicuous ways in which learners managed their interaction was by frequently repeating or modifying their own utterances and those of their interlocutors. 111 instances were identified in which a learner repeated their own previous utterance in whole or in part, either in response to a confirmation check or unprompted. In the latter case, the learner was presumably attempting to pre-empt a breakdown in communication caused by mishearing. The number of instances where learners repeated all or part of an interlocutor's utterance was substantially higher, with 947 instances identified. Since repetition was by far the most common method for carrying out a confirmation check, however, this high number of repetitions largely overlaps with the 1,013 instances of confirmation checks identified in the second tier of the analysis.

Interaction 9 *Example of learner repeating part of own previous utterance in response to confirmation check*

- Lijuan (E) I mean, you need to reverse, like, move the bomb, to see if there a reverse number, a serial number.

- Yuki (D) Serial number?
 Lijuan (E) Yes, **serial number**.
 Yuki (D) 3, L, 9, Q, X, 1.

Interaction 10 *Example of learner repeating interlocutor's utterances*

- Kazu (D) Which [button] do I have, do I have to, uh, press?
 Lijuan (E) Three.
 Kazu (D) **Three**.
 Lijuan (E) Label three.
 Yuki (E) Yes.
 Kazu (D) **Label three**. Okay.

While the repetition of a learner's own or of another learner's utterances undoubtedly plays an important role in interactional discourse management, the vast majority of instances identified here involve the repetition of keywords for solving the in-game puzzles, which tend to be high frequency lexical items and therefore already familiar to the learners. Apart from a small number of cases in which learners repeated utterances that contained low frequency lexical items such as *Morse code* and *lambda*, which could have contributed to the acquisition of these potentially new words, repetition seems unlikely to have significantly facilitated SLA during the game-based interaction.

An additional 18 instances were identified in which a learner paraphrased their own previous utterance, conveying the same message using alternative words or a different syntactic structure in order to make themselves better understood. In 12 further cases, a learner uttered an approximate synonym, that is to say a different word with a similar context-specified meaning to one they had used shortly before.

Interaction 11 *Example of learner paraphrasing own utterance*

- Lijuan (E) Oh, so, so, no vowel, right?
 Yuki (D) Hmm?
 Kazu (E) Hmm?
 Lijuan (E) No vowel, right?
 Yuki (D) No hmm?
 Lijuan (E) No vowel. There's no vowel. **Is there a vowel?**

Interaction 12 *Example of learner uttering approximate synonym to word they used shortly before*

- Yuki (D) White square is third from the left.
 Lijuan (E) Third from the left.
 Kazu (E) Third from the left.
 Yuki (D) And the last. The **bottom**.

A further 18 instances were identified in which a learner paraphrased the utterance of an interlocutor and only two cases were identified in which a learner repeated a word that was approximately synonymous in the context with a word used shortly before by an interlocutor.

Interaction 13 *Example of learner paraphrasing an interlocutor's utterance*

- Yuki (E) Oh, no. Oh, no B.

- Lijuan (D) *No, we don't have, B. We don't have B.*
 Kazu (E) No.

Interaction 14 *Example of learner uttering approximate synonym to word used shortly before by interlocutor*

- Yuki (D) And, [the next symbol is] C with comma.
 Lijuan (E) Okay, with a *dot*.

With only 50 instances in total appearing in the interactions over the four play sessions, it is evident that paraphrased utterances and approximate synonyms were not very frequently used as an interactional strategy. Most cases of paraphrasing involved only minimal changes in wording or to sentence structure and therefore seem to have provided very limited potential for facilitating SLA. However, instances such as Interaction 13 above, which involves altering the syntactic form of a sentence, may nevertheless give a learner the opportunity to practice a structure not yet fully mastered or to notice a gap in their L2 competence.

Furthermore, Interaction 14 above illustrates how a learner may use a synonym to provide implicit corrective feedback that may also lead an interlocutor to notice and address a gap in their L2 knowledge. With only two occurrences over the four play sessions, however, there was not much opportunity for such interactions to positively affect SLA.

The most frequently-occurring type of modified interaction involved learners elaborating on their own previous utterances by adding additional meaning that was not present in the original utterance, with 105 such instances identified over the four play sessions. Only 23 of these instances, or approximately 22% of the total number, occurred within one of the negotiation episodes. Less frequently, one of the learners combined key parts of a previous utterance into a simplified new utterance, with 13 instances of this kind of modified output identified.

Interaction 15 *Example of learner elaborating on own previous utterance*

- Lijuan (E) Okay, so you have to tell us the circle. *Where is the circles?*
 Yuki (D) And, and the circle is, first one is, on the, top, top line, and third from the right.

Interaction 16 *Example of learner simplifying own previous utterance*

- Lijuan (E) And on the right side, A, B, C. And the eight and the B is connected with a black wire and nine and A is connected with a red wire.
 Yuki (D) Huh? One, one more time.
 Lijuan (E) Uh, *eight and B, black*.
 Yuki (D) Okay.
 Lijuan (E) *Nine and A, red*.
 Yuki (D) Okay.

A further 35 cases were identified in which a learner elaborated on an interlocutor's previous utterance. In only 14 of these cases, or 40% of the total number, did the modified output occur within one of the negotiation episodes. 13 instances in which a learner simplified an interlocutor's utterance were also identified.

Interaction 17 *Example of learner elaborating on interlocutor's utterance*

- Kazu (D) And, last [symbol] is, like, hmm, W.
 Lijuan (E) Ah, okay.
 Kazu (D) Curved W.
 Lijuan (E) Ah, *curved W with something on it*, right?
 Kazu (D) Yes.

Interaction 18 *Example of learner simplifying interlocutor's utterance*

- Yuki (E) Ah, do you have batteries?
 Lijuan (D) Okay. Uh, I have four little batteries.
 Yuki (E) Okay.
 Kazu (E) **Four batteries.**

While not all cases of elaboration that were identified in the learner output involved significant additional language, the examples in Interactions 15 and 17 above illustrate how such modified output can lead to more varied and complex language usage in interaction, which could potentially facilitate SLA for all of the interlocutors involved. The data from this case study also shows that the majority of such modified output may occur outside of negotiation for meaning in a narrow sense, as interlocutors make use of this interactional strategy to pre-empt potential breakdowns in communication in addition to repairing existing breakdowns.

While simplification of a previous utterance may be a highly effective interactional strategy for increasing comprehensibility by drawing attention to only the essential information to be conveyed, the examples in Interaction 16 and 18 illustrate a general pattern throughout the data set that does not involve additional lexical output or linguistic structure. The data from these interactions therefore suggest that this form of modified output is unlikely to have a positive impact on SLA.

Table 4 *Summary of interactional strategies (analysis tier 3)*

Interactional strategy	Prior utterance	Session 1	Session 2	Session 3	Session 4	Total
Repetition	Self	23 (2)	31 (8)	28 (5)	29 (6)	111 (21)
Repetition	Interlocutor	107 (4)	326 (18)	316 (16)	198 (15)	947 (53)
Paraphrase	Self	5 (1)	4 (2)	4 (0)	5 (2)	18 (5)
Paraphrase	Interlocutor	8 (2)	5 (1)	5 (1)	0 (0)	18 (4)
Synonym	Self	5 (0)	5 (0)	1 (0)	1 (0)	12 (0)
Synonym	Interlocutor	0 (0)	2 (0)	0 (0)	0 (0)	2 (0)
Elaboration	Self	20 (5)	26 (5)	39 (8)	20 (5)	105 (23)
Elaboration	Interlocutor	6 (2)	10 (2)	13 (7)	6 (3)	35 (14)
Simplification	Self	0 (0)	5 (1)	4 (1)	4 (2)	13 (4)
Simplification	Interlocutor	2 (0)	8 (0)	3 (1)	0 (0)	13 (1)

Discussion

At first glance, the interaction taking place between the learners over the four play sessions appears to hold much promise for SLA, as it involves large amounts of L2 exposure, or input, as well as L2 production, or output. However, the high frequency of occurrence of very short utterances with little or no grammatical complexity, especially once the learners have gained a high level of proficiency at

solving a given module type, casts some doubt on the quality of the L2 output that learners are likely to produce while playing this game and consequently on the potential for the interaction between learners to effectively facilitate SLA.

Nevertheless, the multi-tiered analysis laid out over the previous section helps to elucidate processes of negotiation for meaning and related interactional strategies, providing a more nuanced and optimistic picture of how this game and others that involve a similar information-gap mechanic may aid language learning. Following a narrower definition of negotiation that involves an actual breakdown in communication, 51 negotiation episodes were found to have occurred spontaneously between learners over approximately four hours of play time. This finding clearly demonstrates that the game can elicit spontaneous negotiation for meaning in learner-to-learner interaction and, as a result, the first research question can be answered in the affirmative.

In 26 of the 51 episodes, negotiation was initiated when one learner misheard what another had said or due to ambiguous word usage. The negotiational interactions that followed these breakdowns tended to involve only minimal language with very limited modified output and thus seemed to provide little opportunity for SLA. However, negotiation episodes that had been triggered by vague utterances often involved richer and more varied L2 output, including modified output in the form of elaborations on prior utterances. Additionally, negotiation episodes following breakdowns caused by gaps in lexical knowledge in several instances created opportunities for learners to acquire these new words or at least to notice the existence of lexical gaps in their own L2 competence. These results answer the second research question by suggesting that negotiation for meaning in this game-based interactional context is likely to provide some opportunities for SLA to develop, but that these opportunities may be limited only to certain negotiational contexts and as such may not occur with sufficient frequency to justify the use of the game for language-learning purposes.

The third research question has already been partially answered, as it is clear that interactional strategies occurred during the negotiation episodes described above. However, a significant finding of the study is that a large proportion of interactional strategies occurred outside of the narrowly-defined negotiation episodes, suggesting that interaction directed at pre-empting communication breakdown may hold considerable additional potential for facilitating SLA.

While the second tier of the analysis showed that learners made extensive use of confirmation checks, it is doubtful whether such checks are likely to facilitate SLA, with the possible exception of cases where a learner repeats an interlocutor's unfamiliar word or structure as a step towards acquiring it. Clarification requests, on the other hand, prompted significant modified output in some cases, thus indicating potential to facilitate SLA. However, the number of such cases were limited. Finally, none of the comprehension checks that occurred elicited any substantial linguistic output to facilitate SLA.

The third tier of the analysis revealed that learners frequently repeated their own utterances during interaction and, with much greater frequency, those of their interlocutors. However, as with confirmation checks, the value of such repetitions for SLA seems to be limited to the small number of cases where unfamiliar words are repeated. Learners also occasionally paraphrased their own utterances or those of an interlocutor and at other times they used approximate synonyms for a word uttered shortly before by themselves or by an interlocutor. The paraphrases in general contained only very minor structural or lexical modifications and therefore seem to hold little promise for SLA, while in a single case a synonym was used to provide implicit corrective feedback, which indicates potential to facilitate SLA. In addition, a substantial number of instances occurred where learners elaborated on their own previous utterance or on an utterance produced by an interlocutor. This

involved modified output and in some cases the output was considerable and varied, suggesting the potential to facilitate SLA. It is again interesting to note that most such instances of elaboration occurred outside of the narrowly-defined negotiation episodes. Finally, in some instances, a learner simplified an utterance produced shortly before by themselves or by an interlocutor. These simplifications involved minimal L2 output and thus little opportunity to facilitate SLA.

In light of these findings, it is clear that the learners made regular use of a variety of interactional strategies related to negotiation for meaning, either to repair a breakdown in communication or to pre-empt one. The third research question can therefore be answered in the affirmative.

Based on the interactions analysed in this study, the interactional strategies that are most likely to facilitate SLA are clarification requests and elaborations on a previous utterance that may or may not follow such requests, as both can involve substantial L2 production including modified output. Confirmation checks, repetitions, and approximate synonyms may also facilitate SLA in cases where it draws a learner's attention to an unfamiliar word or provides implicit negative feedback, but such instances occurred infrequently in the data. This answers the fourth and final research question of the study.

Conclusion

This case study demonstrates from an interactionist SLA perspective the benefits that language learners may gain from playing a cooperative digital puzzle game based on an information-gap mechanic. The learner participants produced substantial spoken output over the four play sessions, although much of this output was repetitive and involved only minimal grammatical structure. Episodes of negotiation for meaning occurred several times during each play session, but only episodes that were triggered by a breakdown in communication resulting from vague language use or an ambiguous word led to the kind of linguistically rich interactions likely to facilitate SLA. In addition to narrowly-defined negotiation for meaning, the learners made frequent use of potentially beneficial interactional strategies associated with negotiation for meaning in order to pre-empt breakdowns in communication which had not yet occurred. The strategies that most often led to or involved modified output are clarification requests and elaborations on previous utterances. Confirmation checks, repetitions, and synonyms are other interactional strategies that appeared to hold potential for facilitating SLA by helping learners to notice gaps in their L2 competence, but the evidence for this is limited.

On the whole, the results of the study suggest that this game-based activity elicited several forms of beneficial interactions between the learners and that playing the game, or other games based on a similar information-gap mechanic, is likely to facilitate SLA to some extent. However, additional research needs to be carried out in order to corroborate these findings and to determine if they will also hold true for learners at lower L2 proficiency levels, different age groups, and learners from different cultural or linguistic backgrounds.

In addition to providing insight into game-based learning processes that may facilitate more effective pedagogical design and practice using digital games, this study complements a growing body of DGBLL research by providing further empirical evidence that entertainment-focussed digital games have the potential to play a productive role in language acquisition. While it has been argued that teacher-managed structure and scaffolding activities are essential for effective learning to occur with entertainment-focussed games (DeHaan, Reed & Kuwada, 2010; Miller & Hegelheimer, 2006), Gee (2003) and Reinhardt (2019) point out that high quality digital games tend to already incorporate effective scaffolding mechanisms in their design and these may serve to create sufficient structure for

language learning too. This study, in which learners spontaneously engaged in interactions beneficial to SLA in spite of an almost complete lack of external scaffolding, lends support to the notion that, under the right circumstances, entertainment-focussed digital games can effectively facilitate SLA in settings where no additional learning support is provided. While further research will be necessary to determine whether such games can or should be more widely integrated into formal language-teaching environments, the results of this study suggest that carefully selected games can positively impact language learning in informal and also in quasi-formal settings, such as language laboratories or self-access learning centres.

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Ethical statement

All participants took part in the case study voluntarily and provided written informed consent to have their voices and actions during gameplay recorded and analysed for the purposes of producing and disseminating research on the condition that all published data resulting from the study be anonymised.

References

- Cardoso, W., Grimshaw, J., & Waddington, D. (2015). Set super-chicken to 3! Student and teacher perceptions of Spaceteam ESL. In F. Helm, L. Bradley, M. Guarda, & S. Thouësny (Eds.), *Critical CALL – Proceedings of the 2015 EUROCALL Conference* (pp. 102–107). Padua, Italy: University of Padua. <https://doi.org/10.14705/rpnet.2015.000317>
- Chapelle, C. A. (1997). CALL in the year 2000: Still in search of research paradigms? *Language Learning & Technology*, 1(1), 19–43. <https://doi.org/10.125/25002>
- DeHaan, J., Reed, W. M., & Kuwada, K. (2010). The effect of interactivity with a music video game on second language vocabulary recall. *Language Learning & Technology*, 14(2), 74–94. <https://doi.org/10.125/44215>
- Dormer, R., Cacali, E., & Senna, M. (2017). Having a blast with a computer-mediated information gap task: Keep Talking & Nobody Explodes in the EFL classroom. *The Language Teacher*, 41(1), 30–32.
- Dörnyei, Z. (2007). *Research methods in applied linguistics*. Oxford: Oxford University Press.
- Ellis, R. (2008). *The study of second language acquisition* (2nd ed.). Oxford: Oxford University Press.
- Gass, S. M. (2018). *Input, interaction, and the second language learner* (2nd ed.). New York: Routledge.
- Gass, S. M., & Mackey, A. (2020). Input, interaction, and output in L2 acquisition. In B. VanPatten, G. D. Keating, & S. Wulff (Eds.), *Theories in second language acquisition: An introduction* (3rd ed., pp. 192–222). Abingdon: Routledge.
- Gass, S. M., Mackey, A., & Ross-Feldman, L. (2005). Task-based interactions in classroom and laboratory settings. *Language Learning*, 55(4), 575–611. <https://doi.org/10.1111/j.0023-8333.2005.00318.x>
- Gass, S. M., Mackey, A., & Ross-Feldman, L. (2011). Task-based interactions in classroom and laboratory settings. *Language Learning*, 61(1), 189–220. <https://doi.org/10.1111/j.1467-9922.2011.00646.x>
- Gass, S. M., & Varonis, E. (1985). Variation in native speaker speech modification to non-native

- speakers. *Studies in second language acquisition*, 7(1), 37–57. Retrieved from <https://www.jstor.org/stable/44488545>
- Gee, J. P. (2003). *What video games have to teach us about learning and literacy*. New York, NY: St. Martin's Griffin.
- Grimshaw, J., & Cardoso, W. (2018). Activate space rats! Fluency development in a mobile game-assisted environment. *Language Learning & Technology*, 22(3), 159–175. <https://doi.org/10.125/44662>
- Johnson, R. B., & Christensen, L. (2017). *Educational research: Quantitative, qualitative, and mixed approaches* (6th ed.). Thousand Oaks, CA: SAGE.
- Keep Talking and Nobody Explodes* [Computer software]. (2015). Ottawa: Steel Crate Games. <https://keeptalkinggame.com>
- Krashen, S. D. (1982). *Principles and practice in second language acquisition*. Oxford: Pergamon.
- Loewen, S., & Reinders, H. (2011). *Key concepts in second language acquisition*. Basingstoke: Palgrave Macmillan.
- Long, M. (1996). The role of linguistic environment in second language acquisition. In W. C. Ritchie, & T. K. Bhatia (Eds.), *Handbook of research on language acquisition* (Vol. 2, pp. 413–468). New York, NY: Academic.
- Long, M. (2015). *Second language acquisition and task-based language teaching*. Malden, MA: John Wiley and Sons.
- McKay, S. L. (2006). *Researching second language classrooms*. Mahwah, NJ: Lawrence Erlbaum.
- Miller, M., & Hegelheimer, V. (2006). The SIMs meet ESL: Incorporating authentic computer simulation games into the language classroom. *Interactive Technology & Smart Education*, 3(4), 311–328. <https://doi.org/10.1108/17415650680000070>
- Nunan, D. (2012). *Task-based language teaching* (2nd ed.). Cambridge: Cambridge University Press.
- Ortega, L. (2009). *Understanding second language acquisition*. London: Hodder Education.
- Peterson, M. (2006). Learner interaction management in an avatar and chat-based virtual world. *Computer Assisted Language Learning*, 19(1), 79–103. <https://doi.org/10.1080/09588220600804087>
- Peterson, M. (2010). Computerized games and simulations in computer-assisted language learning: A meta-analysis of research. *Simulation & Gaming*, 41(1), 72–93. <https://doi.org/10.1177/1046878109355684>
- Peterson, M. (2013). *Computer games and language learning*. New York, NY: Palgrave Macmillan.
- Prensky, M. (2001). *Digital game-based learning*. New York, NY: McGraw-Hill.
- Reinhardt, J. (2019). *Gameful second and foreign language teaching and learning: Theory, research, and practice*. Basingstoke: Palgrave Macmillan.
- Schmidt, R. (1995). Consciousness and foreign language learning: A tutorial on the role of attention and awareness in learning. In R. Schmidt (Ed.), *Attention and awareness in foreign language learning* (pp. 1–63). Honolulu, HI: University of Hawaii, Second Language Teaching & Curriculum Center.
- Schmidt, R. (2001). Attention. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 3–32). Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9781139524780.003>
- Sheen, Y. (2008). Recasts, language anxiety, modified output, and L2 learning. *Language Learning*, 58(4), 835–874. <https://doi.org/10.1111/j.1467-9922.2008.00480.x>
- Sheen, Y., & Ellis, R. (2011). Corrective feedback in language teaching. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (Vol. 2, pp. 593–610). Abingdon: Routledge.
- Spaceteam* [Mobile application software]. (2012). Montréal: Sleeping Beast Games. Retrieved from <https://spaceteam.ca>
- Spaceteam ESL* [Mobile application software]. (2015). Montréal: Centre for the Study of Learning

- and Performance, Concordia University. <http://spaceteamesl.ca>
- Sundqvist, P. (2019). Commercial-off-the-shelf games in the digital wild and L2 learner vocabulary. *Language Learning & Technology*, 23(1), 87–113. <https://doi.org/10.125/44674>
- Swain, M. (1985). Communicative competence: Some roles of comprehensible input and comprehensible output in its development. In Gass, S. M., & Madden, C. G. (Eds.), *Input in second language acquisition* (pp. 235–253). Rowley, MA: Newbury House.
- Swain, M. (2005). The output hypothesis: Theory and research. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (Vol. 1, pp. 471–483). Mahwah, NJ: Lawrence Erlbaum.
- Swier, R., & Peterson, M. (2018). 3D digital games, virtual worlds, and language learning in higher education: Continuing challenges in Japan. *The JALT CALL Journal*, 14(3), 225–238. <https://doi.org/10.29140/jaltcall.v14n3.232>
- Sykes, J. M., & Reinhardt, J. (2013). *Language at play: Digital games in second and foreign language teaching and learning*. Upper Saddle River, NJ: Pearson.
- Toyoda, E., & Harrison, R. (2002). Categorization of text chat communication between learners and native speakers of Japanese. *Language Learning & Technology*, 6(1), 82–99. <https://doi.org/10.125/25144>
- Van Eck, R. (2009). A guide to integrating COTS games into your classroom. In R. E. Ferdig (Ed.), *Handbook of research on effective electronic gaming in education* (Vol. 1, pp. 179–199). Hershey, PA: IGI Global.
- Van Lier, L. (2005). Case study. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (Vol. 1, pp. 195–207). Mahwah, NJ: Lawrence Erlbaum.
- Whitton, N. (2014). *Digital games and learning: Research and theory*. Abingdon: Routledge.
- Willis, D., & Willis, J. (2007). *Doing task-based teaching*. Oxford: OUP.
- Wilson, J. (2019). Using the game Keep Talking and Nobody Explodes to practice intensive reading. *Kwansei Gakuin University Humanities Review*, 24, 67–76.

Author biodata

Michael Hofmeyr is Associate Professor in English at Osaka University, Japan. He is interested in all things language-related and has published research articles and book chapters on digital game-based language learning, innovative approaches for teaching critical thinking in an EFL context, and linguistic diversity in Japan. He is currently pursuing a doctoral degree in Applied Linguistics at Kyoto University.

¹ Pseudonyms were assigned to all three case study participants in this paper.

² In this section of the paper, the word or words revealing that communication has broken down appear in bold and italicised text.

³ In these interactional transcripts, the learner currently in the role of defuser is indicated with the letter D and the experts are indicated with the letter E.

⁴ In sections 3.3 and 3.4 of the paper, instances of the interactional strategy in question appear in bold and italicised text.

⁵ In Tables 3 and 4, the numbers in parentheses indicate the number of instances of the interactional strategy in question that occurred within the context of a negotiation episode.