Chapter 23

A Massively Multiplayer Online Role-Playing Game and Its Effects on Interaction in the Second Language:
Play, Interact, and Learn

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ABSTRACT

Massively multiplayer online role-playing games (MMORPGs) have been dramatically used in language education and identified in computer-assisted language learning (CALL) research as playing a central role in second language acquisition (SLA). This chapter addresses the integration of a commercially developed MMORPG Ragnarok Online into a language course as a basis for digital game-based language learning and reports on its effects on second language (L2) interaction. Thirty Thai learners of English who enrolled in a 15-week university language course were required to complete 18 face-to-face classroom lessons and six gameplay sessions. Learners' language use in both text and voice chats during gameplay was recorded and analysed to measure the effects of the game. The findings show that participating in MMORPG resulted in a significantly more considerable increase in L2 interaction that used a wider range of discourse functions compared with English interaction in the classroom. The authors discuss some of the theoretical and pedagogical implications of these findings.

A Massively Multiplayer Online Role-Playing Game and Its Effects on Interaction in the Second Language

INTRODUCTION

From the earliest days of the use of computers in language education, there has been an interest in the pedagogical potential of digital games. Although in the popular media games are generally seen as useful for entertainment only, recent research has convincingly shown their educational benefits (for a review, see Whitton, 2014). As a result, the use of games is becoming more commonplace in classrooms at all levels, including in language education (Peterson, 2016; Sykes, 2015). Ongoing research has demonstrated the effectiveness of digital games in language learning and teaching, as evidenced in journal articles, book chapters, and dedicated volumes (e.g. Airong, 2017; Cornillie, Thorne, & Desmet, 2012; Dixon & Christison, 2017; Jinjing, 2016; Lee & Pass, 2014; Peterson, 2013, 2016; Reinders, 2012; Sykes, Reinhardt, & Liskin-Gasparro, 2013). These studies have shown that digital games have design features that align well with Second Language Acquisition (SLA) theories, and that they are beneficial to second language (L2) learning. One particularly promising connection is with research on interaction as digital games have been recognized as having great potential to engage learners and facilitate real-time L2 interaction with peers and other game players, including native speakers (Gee, 2012; Peterson, 2010b, 2016). Nevertheless, what has not been established conclusively and examined empirically is if playing digital games leads to increased L2 interaction among English as a foreign language (EFL) learners in both quantitative and qualitative aspects. In the following sections, we will briefly discuss the role of interaction in L2 acquisition before looking at previous research into the use of digital games to provide opportunities for language learning and interaction.

LITERATURE REVIEW

The Role of Interaction in L2 Acquisition

Interaction (i.e. communicating with others) has been argued to play an important role in facilitating the language acquisition process (Long, 1981). Considerable attention has been paid to the role of interaction in maximizing the conditions considered theoretically beneficial for SLA, such as providing learners with opportunities to receive comprehensible input (see Krashen, 1985), engage in negotiation of meaning (see Pica, 1994), notice gaps in their L2 knowledge and obtain negative feedback about language use (see Schmidt, 1990), and produce output (see Swain, 1985). It is now widely acknowledged that output and interaction play an important part in learners' eventual success in acquiring a second language (Ellis, 2008). In order for effective learning to occur, it is crucial for language learners to engage in language production; to use the language to communicate, rather than merely to process language input (Ellis, 2005). It is therefore important to identify environments that provide opportunities for language learners to interact more in the L2.

However, encouraging interaction is one of the greatest challenges for language teachers, particularly in foreign language settings where learners typically have opportunities to practise the L2 in the classroom only, and have limited or no opportunities for L2 use in everyday life (Barrs, 2012). In EFL settings such as Thailand (the setting for this study), the quality and amount of English interaction in classes is disappointing. Such challenges occur for a number of reasons, but primarily because the medium of instruction (at all levels of education in the English classroom) is usually conducted in Thai (Khamkhien, 2010) and even when English is used, Thai EFL learners are notoriously reticent when it comes to communicating

in English (Kamprasertwong, 2010), unwilling to communicate in English (Reinders & Wattana, 2014), overly concerned about accuracy in their language use and rote memorization (Mackenzie, 2002), too shy to use English to interact with their classmates (Wiriyachitra, 2001), and uncooperative and unmotivated to participate in class activities in English (Maneekhao & Tepsuriwong, 2009).

Recent CALL studies have been carried out in the field of digital game-based language learning and teaching, or the use of digital games for the purposes of enhancing language learning and teaching (Reinders & Chik, 2016). Of the digital games currently under extensive investigation, massively multiplayer online role-playing games (MMORPG) have received particular attention among CALL researchers. MMORPGs are the type of game played by a large number of players in a complex environment which require a considerable amount of player interaction to progress in the game. This type of game is notable for its features relevant to language acquisition (Peterson, 2010b, 2012a, 2012b). Moreover, many claims have been made for the immersive (Gee, 2007; Zhao & Lai, 2009), linguistically rich and cognitively challenging environment (Sylvén & Sundqvist, 2012) within MMORPGs that may be conducive to language learning and language skills practice. There are also a number of reports (e.g. Bryant, 2006; Thorne, Black, & Sykes, 2009) on the potential benefits of this game genre for providing learners with interactive and motivating environments for language learning and increased opportunities to engage in L2 interaction and other types of interaction (such as negotiation of meaning, collaboration) hypothesized to be beneficial to L2 acquisition. The use of MMORPGs may therefore overcome some of the aforementioned challenges in EFL settings and may provide opportunities for greater interaction among language learners.

MMORPGs for L2 Learning and Interaction

MMORPGs have extended digital game-based language learning far beyond engaging in online activities alone. Significant findings on the effectiveness of MMORPGs on language skills were reported in a large scale mixed-methods study involving 302 elementary EFL students from five schools in Korea, conducted by Suh, Kim, and Kim (2010). After a 2-month experiment, with two 40-minute classes a week, it was found that students in the treatment group who engaged in text chat and activities within the MMORPG 'Noir School,' which was designed specifically to facilitate language learning, showed higher test scores in listening, reading, and writing than the control group who were taught in a face-to-face classroom and did not participate in gameplay. It was also found that learners' English learning achievement in MMORPG-based instruction was influenced by prior knowledge, motivation for learning, and technical issues, particularly by network connection speeds. These findings suggested that English communicative skills can be improved through participation in MMORPG as players have to interact with each other in English during gameplay.

Moreover, MMORPGs have been shown to have a number of key design features and characteristics that greatly impact on learner's affective factors, such as attitude, motivation, and anxiety, which are deemed important for successful language learning. Participation in MMORPGs has been shown to help learners lower anxiety in using the L2, while increasing their confidence and motivation (deHaan, 2005; Li, Liu, & Boyer, 2009; Peterson, 2010a, 2011; Voulgari, 2011; Zhao & Lai, 2009; Zheng, Young, Brewer, & Wagner, 2009), and thus become willing to use L2 to interact (Reinders & Wattana, 2012). Reinders and Wattana investigated the use of the MMORPG 'Ragnarok Online' in a Thai EFL class and its effects on learners' L2 production and willingness to communicate. Sixteen university students were engaged in three computer game sessions and completed questionnaires gauging their willingness

to communicate during gameplay. In addition to their self-report on positive perceptions of willingness to communicate, low anxiety when interacting in English during gameplay, high self-perceived communicative competence, and high frequency of L2 use, their remarkably increased L2 use indicated that their willingness to communicate was enhanced by playing games. These findings were congruent with a follow-up study (Reinders & Wattana, 2014) which involved similar conditions and procedures and was carried out with a larger number of students (N = 30), over a longer period of time (six computer game sessions in a 15-week semester), and using a wider range of data sources (questionnaires, observations of participant interactions during gameplay and interviews). The results from a paired *t-test* indicated statistically significant improvement in learners' willingness to communicate after they had completed the six game sessions. According to Peterson (2016), key features of MMORPGs, such as their highly learner-centred nature of the interaction provided by network-based games, the relative anonymity they afford, the reduced inhibition through the use of personal avatars, and the reduction of social cues (e.g. age, genre, race, etc.) during real-time chat, help to create a more stress-free communicative atmosphere and opportunities for taking risks with L2 use than in a face-to-face setting, supporting positive affective factors.

In a study of online gaming and open internet environments as informal settings for L2 use and development, Thorne (2008) explored multilingual interaction between an English speaker living in the United States and a Russian speaker living in Ukraine within the MMORPG "World of Warcraft." Participants' feedback was very positive, with claims that participation in the game had enhanced their enjoyment and motivation for language learning. In addition, the analysis of the chat logs indicated that conversation in the game offered participants opportunities for authentic interaction in the L2 and opportunities for providing expert knowledge in terms of language use and language-specific explicit corrections, requests for assistance, and collaboratively constructing repair sequences. Roy (2007) also investigated the potential in World of Warcraft by playing the game in Spanish. Although the author reported that he did not have much interaction with native speakers, he found that real-time chatting during gameplay exposed him to natural L2 production, and that the interaction in which he engaged was a meaningful way to become comfortable with using the language.

Studies by Peterson (Peterson, 2012a, 2012b) focused specifically on learner interaction in MMORPGs. Peterson (2012a) examined the use of the MMORPG "NineRift" and engaged six Japanese EFL university students in two gaming sessions, lasting approximately 90 minutes each, which were held one week apart. He obtained data from a variety of sources (i.e. learners' chat collected during gameplay, researcher observations, filed notes, learner responses to pre- and post-study questionnaires, and interviews). The findings indicated that learners actively participated in the game, utilized different types of strategies to manage their interaction, undertook collaborative dialogues exclusively in the L2, and had positive attitudes, claiming that interaction in MMORPGs was engaging, motivating, and enjoyable, and improved their fluency and discourse management practice. Peterson's (2012b) later study investigated linguistic and social interaction and attitudes of four intermediate Japanese EFL university students in the MMORPG "Wonderland." Participants were engaged in four sessions, lasting approximately 70 minutes each, which were held once a week over a period of one month. Similar to the findings previously reported (Peterson, 2012a), it was found that participants used a range of strategies, and conducted their interaction exclusively in English. In addition, participants provided largely positive feedback, claiming that interaction in MMORPGs, in combination with the anonymity provided by the use of pseudonyms and avatars, helped to reduce anxiety levels and encouraged opportunities for taking risks

in using English. This feedback thus mirrored findings reported in the literature on learner interaction in MMORPGs (e.g. Peterson, 2011).

MMORPGs have thus been shown to have the potential to lead to greater learner engagement and in this way greater use of the target language. What has not been clearly demonstrated is if this indeed does lead to a greater quantity and quality of L2 interaction among EFL learners, which is the focus of our study. The purpose of the study was to investigate the effects of participating in an MMORPG on learners' interaction in English. Our research questions were:

1. How much L2 interaction do Thai learners of English as a foreign language produce while playing MMORPG?
2. What differences are there between interaction in class and in the game?

We were also interested to see if the different modalities used in the game (writing text chats versus speaking in voice chats) had an impact on participants' interaction. We therefore asked:

3. What differences in learners' interaction are there between text and voice-based chat while playing MMORPG?

We will now describe the methodology of our study.

METHODOLOGY

Participants

The study was conducted with 30 Thai EFL learners at a university in Thailand. They had different English language proficiency levels (i.e. 13 elementary students, eight lower- intermediate students, seven upper-intermediate students, and two advanced students), as shown by their scores on two university tests of English proficiency. (The reason for this range of proficiency levels was that the course was only offered once per academic year.) Participants had fairly homogeneous language backgrounds; all of them being native Thai speakers without experience of living or working in an English-speaking country. The participants were also similar with regard to game experiences. That is, all of them had previous experience playing digital games, particularly MMORPGs, meaning they did not require special training in using games. All the participants were also found to be sufficiently proficient in synchronous communication and typing skills to be able to readily engage in interaction during game play. It is therefore reasonable to expect minimal novelty and training effects.

Context and Intervention

The study was carried out during a 15-week course of English for Information Technology, designed and taught by one of the researchers, for third year undergraduate students from the school of Information Technology at a university in Bangkok, Thailand. Their participation was voluntary and their results were anonymised and in no way affected their course grades. The classes met for two 90 minutes' sessions per week and were taught entirely in English. The course covered six units and there were six review

sessions. The intervention, the use of the MMORPG 'Ragnarok Online', was integrated as part of the course as a lesson review session delivered after participants finished each unit. We applied a digital game-based language learning approach to supplement traditional language learning. The interest in the use of MMORPG was influenced by sociocultural theory (SCT) rooted in Vygotsky's (1978) work, which emphasises the importance of social interaction among learners, allowing them to work together, exchange information, and support each other, a significant perspective in SCT, known as collaborative learning. The sociocultural perspective in SLA (Lantolf, 1994, 2006, 2000) makes a strong argument for the role of social interaction during task completion in providing learners with opportunities to practise the language and learn from each other as more expert learners help less expert ones to acquire the target language, or scaffolding which is part of learning. This phenomenon is viewed as acting within the zone of proximal development (ZPD), a concept in SCT that creates the conditions for language learning and production to take place.

With permission from the game's local distributor, we could host the game on a private server in the lab of the university, thereby giving us control over who could access the game. We also obtained permission to modify the game to ensure its appropriateness to the language learning context, as well as its alignment with the course's learning activities and objectives. In other words, the modification in this study meant creating new quests (i.e. the missions that players are assigned to accomplish within the game) relevant to the participants' course. The previously learnt material was endogenously integrated into the narrative of Ragnarok Online (Habgood, Ainsworth, & Benford, 2005), in order to provide the participants with learning opportunities while engaged in the process of playing. In particular, the six new quests covered scenarios which were related to the courses' learning content and objectives. Figure 1 shows a screenshot of one of the quests used for this study.

Figure 1. A screenshot of quest 4: How much do you know about operating systems?

Face-to-Face Communicative Activities

During the second and third sessions of the course, participants participated in traditional, face-to-face communicative activities including discussion (which took about 15 minutes to complete) and interview role-play (which took about 30 minutes to complete) in which they performed together in small groups and in a whole-class context. These took, altogether, approximately 45 minutes to complete. These two activities were chosen because they gave everyone a chance to participate and become actively involved. They are also very common classroom activities used to promote language learner interaction. Participants' interaction during these two face-to-face activities was recorded to provide baseline data for their English interaction in the classroom.

Digital Game Activities

After completing all face-to-face sessions of each unit, the participants completed an MMORPG session. Each game session took 15 minutes for briefing, 45 minutes for game task completion, and 15 minutes for debriefing.

A 15-minute briefing was given to allow participants to understand the objectives of the game session, to be reminded that their interaction in the game was not graded, to work with each other in preparing relevant grammar and vocabulary points necessary to complete the quest, and to familiarise themselves with the quest.

There were six game sessions which involved both text-based interaction and voice-based interaction. The participants were asked to log into the game "Ragnarok Online," the chat program "Skype," and the recording program "Pamela for Skype." Skype was used instead of the in-game communication tool for the convenience of recording and analysing the chat history. In the first three game sessions, the interaction was carried out through the medium of typed text in which the participants could interact with anybody in the game. Participants were asked to add all the participants in the contact list of their Skype account to a conversation group so that all of them could communicate simultaneously. Although pairing participants might have led to more communication, group chat was used to promote natural and real communication in the game in which players were free to talk to anybody. In addition, if inexperienced, inconfident participants were paired together, they might not (be able to) complete the quests. In the final three game sessions, the participants were required to communicate with each other by voice chat. They were randomly paired and asked to use Skype to call each other. This time participants were paired due to the fact that during the investigation, the current version of Skype only allowed two people to communicate simultaneously. The pairs remained the same throughout the last three game sessions. While participants were playing the game, the researchers did not take part in any of the tasks, but were present in the lab to assist with technical problems.

After each game session, participants were asked to export their chat history from the recording software and save it on their desktop. A 15-minute collaborative debriefing then took place during which the participants were asked to discuss in small groups their experience, success, and failure in the game and how they had communicated with each other. The participants were also asked to make a connection between the game content and the learning objectives, and to connect their communication that took place during the game to some real-life situations.

Measuring L2 Interaction

Learners' interaction was operationalised as production in English. In our study, interaction concerned itself mainly with interpersonal interaction between non-native speakers (NNPs) of English and it was measured both quantitatively and qualitatively. The quantitative analysis looked at the number of words produced in English during two face-to-face class sessions and during each of the six game sessions. Words were counted regardless of accuracy in spelling, pronunciation, grammar, or usage. The qualitative analysis addressed specific concerns for L2 use by looking at the functional characteristics of the communication in which participants were engaged during class and gameplay time. We first present classroom interaction results, then game interaction results, and then differences between the two.

RESULTS

Quantity of Interaction in the Classroom

We calculated the total number of words produced and the average number of words per participant. Descriptive statistics obtained included mean scores (*M*), standard deviations (*SD*), minimum (min), and maximum (max) for the amount of interaction. Cohen's *d* (1988) was subsequently calculated to indicate the effect size. Following Cohen's (1992) standard criteria, this study's analysis interpreted sizes of 0.2 as a "small" effect, around 0.5 a "medium" effect, and 0.8 a "large" effect.

Analysis of the transcripts of classroom interaction (see Table 1) showed only a small amount of L2 production while the participants were engaged in traditional, face-to-face activities. The participants used their native language frequently and one participant did not talk in English at all during the two recorded activities. The participants did not produce many words (a total of 1,257 with an average of 42 words per participant) during the 45-minute activities. One difference we found was between small-group communication and whole-class communication; as was to be expected, in the discussion activity the participants produced significantly more English than during whole-class work ($t(29) = 6.21$, $p < 0.001$), with a large effect size ($d = 0.93$). Also in the interview role-play this difference was significant, ($t(29) = 5.44$, $p < 0.001$), again with a large effect size ($d = 1.17$).

Table 1. Number of words produced in face-to-face communicative activities

		Activity 1 Discussion (15 Minutes)			Activity 2 Interview Role Play (30 Minutes)			Total
		Group Work	Whole Class Work	Total	Group Work	Whole Class Work	Total	
Total number of words		497	92	589	605	63	668	1,257
By participant (N=30)	Min	0	0	0	0	0	0	0
	Max	79	35	114	84	14	98	212
	M	16.57	3.07	19.63	20.17	2.10	22.27	41.90
	SD	18.40	8.61	26.15	21.48	3.85	24.95	50.92

This finding was supported by participants' self-reported English use in class in which they reported low frequency of English use in the classroom (see Reinders & Wattana, 2015 for more questionnaire results).

Quantity of Interaction in the Game: Text and Voice Chat

When looking at the results for L2 production during game play, it was found that the number of words was considerably higher in the final gaming session than in the first (increasing from 57.83 per participant to 79.83 per participant (see Table 2)). In addition, in text chat, the number of words produced went up from the first to the third text chat, from 57.83 words per participant to 114.13. This increase was found to be significant ($t(29) = 11.27$, $p < 0.001$) with a large effect size ($d = 0.87$). The same applied to the voice chat sessions where the number of words increased from 45.57 to 79.83, again a significant difference ($t(29) = 18.51$, $p < 0.001$) with a large effect size ($d = 1.96$). Participants produced more English in text chat ($M = 250.43$, $SD = 100.13$) than in voice chat ($M = 182.97$, $SD = 45.67$). Also this difference was significant ($t(29) = 5.66$, $p < 0.001$), with a large effect size ($d = 0.86$).

Comparing the Quantity of Interaction in Class and in the Game

The number of words produced in the communicative tasks in the classroom was compared with the number of words produced during the last game play session in which the participants were by then a) confident in using a synchronous communication tool to interact with each other orally, and b) familiar with interaction in English in an online game context. The face-to-face communicative activities and the last game session were deemed to be comparable. This is because they both took the same time to complete (i.e. 45 minutes) and both involved oral communication. We used a paired-samples t-test with alpha set at .05 to compare if there were any significant differences between the quantity of interaction in the classroom and the game. Students produced an average of $M = 41.90$ ($SD = 50.92$) during face-to-face interaction and during game play $M = 79.83$ ($SD = 20.48$). This difference was found to be statistically significant ($t(29) = 5.49$, $p < 0.001$), with a very large effect (see Table 3).

Table 2. Number of words produced during the six game sessions

		Text-Based Chat Session[1]			Total	Voice-Based Chat Session[1]			Total	Total
		1	2	3		4	5	6		
Total number of words		1,735	2,354	3,424	7,513	1,367	1,727	2,395	5,489	18,491
By each participant (N=30)	Min	17	28	51	101	22	33	51	106	313
	Max	115	154	235	487	79	86	140	305	1,073
	M	57.83	78.47	114.13	250.43	45.57	57.57	79.83	182.97	616.37
	SD	22.69	30.92	47.98	100.13	13.75	12.93	20.48	45.67	184.64

Note: [1]Each computer game session lasted approximately 45 minutes.

Table 3. Paired samples t-test for average number of words produced in class and in the game (N = 30)

Pair	Mean (SD)	95% Confidence Interval of the Difference		t	df	Sig. (2-Tailed)	Effect Size
		Lower	Upper				
Computer game class	79.83 (20.48) 41.90 (50.92)	23.81	52.05	5.49	29	.000	$d = 0.97$

Quality of Interaction in the Classroom

When the language data was examined for evidence of discourse functions used during the class activities, it was found that participants' interaction, in general, was marked by numerous short turns. As expected, participants were found to use their L1 very frequently, and their interaction included the use of 'Tinglish' (a form of English produced by native Thai speakers, characterised by such features as the adoption of Thai utterance particles at the end of a phrase or sentence, and word-for-word translation from Thai to English). Participants were also found to frequently revert to Thai, especially when they wanted to say something complicated, when they needed to solve communication problems, and when they wanted to convey emotions and feelings and to reflect the hierarchical and class structure of Thai society (for example by the use of status-indicating particles). In terms of the functional characteristics of their L2 production, participants produced several types of discourse functions, especially during group work, to complete the assigned tasks and maintain the interaction. However, their frequency was low (see Table 4).

Excerpt 1, which is unedited, provides examples of the categories and exhibits the nature of face-to-face oral interaction between participants while working collaboratively during a 15-minute group work as a preparation stage before performing a role-play. Individual participants are referred to by their game characters' names to preserve anonymity. Italicized utterances indicate where participants' L1 was used.

Excerpt 1. Preparing for the role-play

BB:	Ok. We should start now.
bingo:	Not ready. Give me time to understand teacher request *kon*[1].
BB:	Sure
Equal:	We need how many character?
BB:	Five. doctor, teacher, architect, musician, businessperson
Doraemon:	*Took kon tong pood mai?*[2]
Static:	Yes.
BB:	We must to choose job and prepare dialogue.
bingo:	Explain please.

-The explanation and questions for more information reverted to Thai until each participant understood their roles-

BB:	Time to speak English now.
Equal:	OK. I need 2 minutes prepare.
BB:	2 minutes ok. What you think?

Note. [1] '*kon*' means 'first' in English.
[2] [Does everybody have to participate?]

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Table 4. Discourse functions of clauses in class activities (N =30)

	Activity 1 Discussion (15 Minutes)		Activity 2 Interview Role Play (30 Minutes)		Total
	Group	Class	Group	Class	
Greetings	0	0	0	0	0
Directives	5	0	9	0	14
Self/Peer corrections	0	0	6	0	6
Questions/Requests					
- Asking for opinions	6	0	8	0	14
- Request for information	3	0	5	0	8
- Questions on language/vocabulary	6	0	10	0	16
- Asking for explanations	2	0	0	0	2
- Confirmation checks	0	0	0	0	0
- Comprehension checks	0	0	0	0	0
- Clarification requests	8	1	10	0	19
- Requests for help	5	0	6	0	11
- General questions	5	0	8	0	13
- General requests	4	0	5	0	9
Responses					
- Giving opinions	7	0	8	5	20
- Explanations	4	0	4	0	8
- Clarification	6	0	6	0	12
- Feedback	8	1	9	0	18
- Trouble or non-understanding	6	1	6	0	12
- General responses	48	13	59	13	133
Humour	0	0	0	0	0

Quality of Interaction in the Game

The interaction during gameplay commonly featured a) extensive use of authentic language which was appropriate for the context, b) minimal use of the L1 (yet with the use of 'Tinglish'), c) misspellings (particularly, in text-based chat), and d) a number of simplified or reduced registers (especially in text-based chat), a unique style of interaction within the game which can be regarded as a form of online chat. Simplified or reduced registers here included a) the use of numbers, special characters, and symbols (i.e. emoticons to exhibit facial expressions, exclamation marks to represent tone of voice) to replace words, b) omission of articles and use of contractions (to make message delivery easier and faster), and c) abbreviations and acronyms (which were frequently posted in text-based chat). Use of simplified or reduced registers could be considered inappropriate for language learning, but it seemed to help participants to interact with each other quickly so that they could complete the game quest within the time allotted. Analysis of the chat transcripts showed that participants generated a wide variety of discourse functions

when playing and working collaboratively in the game. Table 5 summarises the frequencies of the oc-currence and types of discourse functions which were present while participants engaged in the game.

Excerpt 2 exhibits the nature of text-based interaction during the second online game session when participants were helping each other to find a starting NPC.

When comparing L2 interaction in text-based chat and voice-based chat, it was found that participants generally produced a greater number and variety of discourse functions in voice-based chat than they did in text-based chat. Nevertheless, it is important to note here that, in addition to different modes of communication, the different number of participants in each modality (i.e. group work during text-based chat and pair work in voice-based chat) would probably partly explain this.

Many language functions identified in this study are considered beneficial for language development through social, collaborative interaction during gameplay. Greetings, asking questions and the use

Table 5. Discourse functions of clauses in online game activities by all participants across all six sessions (N =30)

	Text-Based Chat			Total	Voice-Based Chat			Total
	Session[1]				Session[1]			
	1	2	3		4	5	6	
Greetings	5	3	3	11	15	16	22	53
Directives	16	20	29	65	18	21	28	67
Self/Peer corrections	15	17	19	51	7	15	24	46
Questions/Requests								
- Asking for opinions	11	18	27	56	9	14	17	40
- Request for information	17	25	30	72	25	30	32	87
- Question on language/ vocabulary	9	16	18	43	16	15	22	53
- Asking for explanations	7	12	15	34	10	12	14	36
- Confirmation checks	4	5	5	14	8	16	17	41
- Comprehension checks	2	4	5	11	7	15	16	38
- Clarification requests	10	16	19	45	18	24	26	68
- Requests for help	8	15	22	45	16	18	24	58
- General questions	12	25	27	64	17	20	22	59
- General requests	10	14	16	40	15	24	27	66
Responses								
- Giving opinions	11	19	28	58	11	14	21	46
- Explanations	8	13	15	36	10	15	16	41
- Clarification	10	17	20	47	18	25	26	69
- Feedback	12	15	17	44	14	15	24	53
- Trouble or non-understanding	5	6	7	18	17	19	23	59
- General response	180	245	332	757	59	75	160	294
Humour	5	7	10	22	4	5	6	15

Note: [1]Each game session lasted approximately 45 minutes.

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Excerpt 2. Help with finding a starting NPC in text-based chat

Alphabeat:	Hey friends!!!! We need to find npc shop manager to start quest.
Absolute:	Um… where we can find manager *la*[1]?
Equal:	quest say manager is in Izlude.
Absolute:	yes, i know but where? and how we go?
KILLUA:	We must read map teacher gave.
Farminggo:	Yes!!!! Agree!!!!
	Please wait. I reading map now.
Independent:	read read read
DoTaeHee:	I think i know place we can fine manager. Why not follow me?
KimTaeYeon:	good idea ^^
BE:	I can follow u anywhere but don't take me to hell.
DoTaeHee:	555[2]
Alphabeat:	we should go to south and then to the rite.
	*right[3]
DoTaeHee:	Yes
Follow me:	I want 2 walk fast. do you know how 2 set?
KUMMONG:	Sorry you can not. you are not gm. gm can do everything.

Note. [1] '*la*' is an informal particle which does not add the meaning of a sentence and is used in spoken Thai
[2] '555' is the Thai version of 'lol' used in a text chat. The number '5' in Thai is pronounced as   'ha' so '555' would be 'hahaha'
[3] * was used by this participant as a signal for self-correction

of requests, for example, were present frequently in both text-based chat and voice-based chat, when participants worked together, either to complete game tasks or to produce the language, thus creating a collaborative environment. Moreover, findings revealed that during greetings and small-talk in most game sessions, humour was often found in participants' discourse as a means to facilitate social interaction. Analysis also revealed that participants requested information and help relating to gameplay, task completion, language issues, and technical matters during gameplay. These requests increased from the first session to the last session of each communication mode. Moreover, the responses to these requests, which were quite promptly provided, were found to be appropriate, helpful, and supportive, offering strong evidence of participants' desire to help each other. A typical interaction can be observed in Excerpt 3 when participants requested and provided assistance regarding quest completion while interacting via voice-based chat during the fourth gameplay session.

Excerpt 3. Request for and provision of assistance regarding quest completion via voice-based chat

Shadow:	I lost quest sheet so I not read it for today. Please explain me.
Alphabeat:	Yes, sure. Quest is test knowledge about OS. We need to find 'Tutor' to accept the quest. 'Tutor' will ask we advise other NPCs about OS. When finish, we can upgrade to 'Novice High.' Understand?
Shadow:	Yes, I understand. Let's do it now!
	.....10 turns of dialogues.....
Shadow:	Good job, buddy. What we should do next?

Comparing the Quality of Interaction in Class and in the Game

To investigate the effects of playing computer games on the quality of L2 interaction, participants' discourse functions produced during the *two recorded class activities* and *the last game session,* were compared. The most interesting finding was the reduced use of participants' L1 during *gameplay* compared with the *in-class activities*. However, the primary purpose of L1 use was found to be similar in both settings - to successfully maintain their conversations in English. For example, the L1 was used together with the L2 when participants wanted to express unknown vocabulary in English, to say something complicated, or to solve communication breakdowns. Furthermore, analysis of participants' interaction during *gameplay* generally evidenced a wider variety and a greater number of discourse functions than did the *class activities* (see Table 6).

Although no statistical tests were carried out to determine if there were any significant differences in the quality of interaction between class and online game activities, there were indications in the transcripts that online games might be effective in encouraging Thai EFL learners to produce more discourse functions.

Table 6. Discourse functions used by all participants in class and the game (N = 30)

	Class Activities	Computer Game Activities
Greetings	0	22
Directives	14	28
Self/Peer corrections	6	24
Questions/Requests		
- Asking for opinions	14	17
- Request for information	8	32
- Questions on language/ vocabulary	16	22
- Asking for explanations	2	14
- Confirmation checks	0	17
- Comprehension checks	0	16
- Clarification requests	19	26
- Requests for help	11	24
- General questions	13	22
- General requests	9	27
Responses		
- Giving opinions	20	21
- Explanations	8	16
- Clarification	12	26
- Feedback	18	24
- Trouble or non-understanding	12	23
- General responses	133	160
Humour	0	6

DISCUSSION AND CONCLUSION

The study clearly showed that interaction during gameplay encouraged language learners to produce significantly more L2 output containing a wider variety of discourse functions than in-class activities. Overall, the largely positive findings in this investigation suggest that MMORPGs play an important role in increasing the quantity and quality of L2 interaction among Thai EFL learners.

In class, Thai EFL learners in this study reported using English very little, even when engaged in supposedly communicative activities. This is supportive of Thai EFL learners' views that class activities may not encourage them to try to use English (Khamkhien, 2011). Perhaps not surprisingly, they feel they use English more often in class when talking with friends than by responding to the teacher. The use of the Thai language was common, even during communicative activities such as discussions and interviews. Due to the small amount of L2 interaction, it was not surprising to observe little use of the different discourse functions in the recorded class activities.

During the game sessions, on the other hand, the quantity and quality of L2 interaction was quite different. Participants produced significantly more L2 output during gameplay than in class, with a very large effect size. Participants also produced significantly more English over time from the first to the last recorded game session, and they produced more English during text chat than during voice chat. This was a considerable achievement since the study was conducted among non-English majors with limited English proficiency, and it had proved to be very challenging to get Thai EFL learners in general to participate in English (Brown, 2006). Clearly, our findings confirm claims that MMORPGs have the potential to provide extensive opportunities for authentic L2 interaction, as postulated by Bryant (2006), Rankin, et al. (2006), Roy (2007), and Peterson (2010b). Finally, participants produced a wider variety of discourse functions in gameplay activities than in class activities. These finding are particularly supportive of a) the SCT perspective in that gameplay could be conceptualised as a sociocultural activity, including game tasks that generally enable learners to produce more language, and b) the constructivist approach in that for these participants it was important to interact in the target language even though they knew they made mistakes, which is an important part of the learning process. However, this is not a common occurrence when Thai EFL learners have been found to be unable to communicate in English with confidence when working together to carry out communicative activities in class because they are anxious about making mistakes (Boonkit, 2010).

Even though communicative activities like discussion have been noted in the literature as being effective in allowing learners to interact with each other using the target language, our study has supported that it is participation in MMORPGs that leads to a more significant increase in the quantity of L2 interaction. Our findings support previous studies providing evidence of a greater amount of L2 production and more equality of participation in online interaction, including MMORPGs (e.g. Peterson, 2012a; Rankin, Gold, & Gooch, 2006; Rankin, Morrison, McNeal, Gooch, & Shute, 2009) and other types of computer-mediated communication (CMC) environments (e.g. Warschauer, 1996), one of the means of communication within the game, than in face-to-face classroom interaction.

All of these results point to a number of factors that appear to strongly impact Thai learners' experience of learning and using English. One of these is related to the issue of anxiety. Participants indicated associating speaking English with feeling anxious and incompetent. Willingness to Communicate has been proposed as a term to capture a range of different factors that contribute to learners engaging, or choosing not to engage, in L2 communication (MacIntyre, Dörnyei, Clément, & Noels, 1998). Issues such as motivation, individual differences (overt versus extravert learners), risk-taking, and others play

a role in determining whether a particular learner, or indeed groups of learners, is more or less likely to speak. In the classroom setting, the participants in this study reported a number of affective barriers to their engagement, at least in situations where they had to communicate 'publicly'.

Activities that provide a degree of security, on the other hand, encouraged learners to participate more. An example of this is the activities learners complete together with friends, even in class (which they rated as more likely to lead them to speak English). However, it was the game environment and characteristics that led to a significant, and remarkably large, increase in the use of English. Zhao and Lai (2009) explain that through anonymity during gameplay, players are less inhibited in L2 interaction and more freely experiment with the language to accomplish game quests. In addition, activities that are conducted in a safe, fun, engaging, and non-threatening setting, like quest completion, may encourage participants to interact in the L2 more. This possibility was identified in the questionnaire and interview findings of our study (Reinders & Wattana, 2015) conducted to identify how the participants experienced communication in the game, but early indications and observations made during the study itself showed that participants felt much more comfortable while playing games and more confident in using the target language. According to the interview, one participant, who did not talk much in class but appeared to show increased participation in the game, felt that the low-anxiety atmosphere in the game allowed him freedom to interact in the L2. Interestingly, he said that he felt uninhibited to talk even though he did not know much about things to say in the game, and that he talked more and more freely in the game, especially when his partners were funny, friendly, or supportive. This is also evident in other studies which found learners' positive attitudes as a result of feeling secure in the environment provided by digital games (Adris & Yamat, 2015; Peterson, 2011, 2012b; Zheng, D., Young, M. F., Brewer, R. A., & Wagner, M., 2009).

This is in line with research that has shown the affordances of gaming environments for the development of alternative or additional personae, related to but also in a way distinct from the person who creates them (Turkle, 1997). Pearce (2009) has argued that online spaces, and in particular those found in online role-playing games, allow for a process of 'disembodiment' and subsequent 're-embodiment', where players create new identities that are subsequently integrated into their own lives. Although a further discussion of this subject is beyond the scope of this article, it is clear that such studies have shown the affective impact of participating in such online environments. In our study one of the results was clearly a reduction in some of the barriers that learners perceived in traditional classroom communication, and an increased willingness to communicate online.

Another result from our study supports this possibility; our observations showed that L2 production was significantly higher during text chat than during voice chat. One of the reasons is most likely that speaking for these learners is more difficult than writing, but speaking is also more personal. Using one's voice is directly related to one's person and as such may be seen as more threatening than using text chat. This finding is in line with previous research (see Abrams, 2003; Kern, 1995). However, language use during voice chat was still significantly higher than during classroom communication, showing that participants felt more comfortable in the game environment.

Another reason for our findings may be that in games the focus is, or at least is perceived to be, less on accuracy than on fluency. Many tasks require immediate decision-making and quick collaboration and therefore communicative engagement is a requirement. As reported above, Mackenzie (2002) and others have shown many Thai learners to be extremely concerned about producing accurate language

and avoiding mistakes at all costs. This often leads to limited communication. In the context of games, however, learners may not feel so much pressure and are more likely to take risks in their L2 production.

These results have a number of implications. Firstly, the results corroborate earlier observations about the very small amount of language use by English learners in classroom-based learning. Kaplan and Baldauf (1997), for example, have shown that the amount of language production in foreign language classes is far smaller than generally assumed, and also far smaller than is needed for the development of conversational skills. In Thailand in particular, this is a common and well-documented problem (see Khamkhien, 2010, 2011). Unfortunately, our study lends further support to these observations; on average participants only produced 42 words in class. Considering that for most learners their English classes offer the only opportunity for target language interaction, this is likely to be insufficient.

At a practical level, this implies the need for teachers to be aware of the stated purposes of their lessons and in particular communicative activities such as discussions and interviews, and learners' actual engagement with these. The use of measures of engagement such as recordings, observations, and also students' own records, may be helpful to determine if all learners are indeed getting the intended amount of practice. Where this is not the case, teachers can take remedial action. For classroom-based communicative activities our results also point to the need for teachers to create an atmosphere that is supportive and non-threatening. Participants in our study indicated they used English more with friends in class than in other groupings; perhaps teachers could allow students to self-select their pairs and groups, at least initially.

Another implication of this study is that games, or at least the MMORPG used in this study, do appear to lead participants to be more willing to communicate in English. The difference between language production in the classroom activities and in the game sessions in our study was considerable, and as students became more familiar with the game environment, their language production went up. This shows the potential for games to draw even learners who are known to be reluctant to use the target language to speaking in English. In particular in contexts such as Thailand where many learners are perceived to lack in motivation to learn English (Maneekhao & Tepsuriwong, 2009), games may offer a degree of much-needed excitement. At a very practical level, games may also afford teachers in Thailand and other countries opportunities to encourage interaction that would otherwise be difficult to achieve schools with commonly large average class sizes.

The use of digital games may not be feasible for all teachers, but the principles underlying game play can be emulated in other ways, either through non-digital games or by creating environments perceived by learners to be 'safe' and that are intrinsically motivating, perhaps by being entertaining. The game environment in this study also encouraged learners to collaborate. Various tools are available for players to find others, to share information with them and to complete tasks together. We encouraged this further by developing simple quests that required students to find information, exchange it, work with other students, and generally to communicate. These are attributes of classroom activities that can be incorporated in other, non-game, settings too. This may be particularly important in contexts where the use of games is not commonplace, or may raise concerns among, for example, parents about the perceived potentially detrimental effects of gameplay.

In conclusion, participation in MMORPGs can provide opportunities for learners to engage in forms of L2 interaction. We hope with this study to bring attention to the need for improvement in the teaching of oral skills and the potential of games for this. Digital games, and particularly MMORPGs, are now

such a large part of our students' lives, that finding pedagogically sound ways of incorporating them into the classroom may be a much needed challenge for the language teaching profession to tackle. Just as music and movies are no longer absent from most classrooms, games too may have a role to play. There are many relatively easy tasks that can be built around existing games (cf. Reinders, 2009 for examples related to the teaching of writing) without the need for extensive technical knowledge or investments and our studies such as this one will encourage teachers to look more closely at the possibilities of bringing digital games into the curriculum.

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KEY TERMS AND DEFINITIONS

Digital Game-Based Language Learning: A learning setting involving the use of digital games to enhance language learning and teaching.

English as a Foreign Language (EFL) Learners: People who learn English in a context where English is not used for everyday purposes (such as Thailand). EFL learners typically learn and practise the target language exclusively in the classroom. In this study, this term is used to refer to tertiary-level Thai students.

Interaction: Communication between learners. The study concerns itself mainly with interpersonal interaction between non-native speakers (NNPs) of English and focuses primarily on the quantity and quality of interaction in the target language (i.e., English).

Massively Multi-Player Online Role-Playing Game (MMORPG): The type of game played by a large number of players in a complex environment allowing a large amount of player interaction in order to progress through the game.

Quest: The mission that players are assigned to accomplish in order to progress throughout the game.

Second Language Acquisition (SLA): The process of learning a second or foreign language (L2).