Investigating Interaction during Joint Language Learning Activities Utilizing Video Games

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Abstract

This RILS project examines learner interactions during a joint language learning activity utilizing commercial video games. Four pairs of students agreed to be video recorded while playing video games and engaging in a joint language learning activity under a variety of experimental conditions. The project seeks to answer the following questions:

1) What effect does introducing a structured language learning activity have on interactions between participants engaged in unstructured gameplay with a   digital game?

2) How does varying the intended task outcome affect the linguistic output of learners engaged in a structured language learning activity utilizing digital games?

3) How does varying the intended task outcome affect the functions of language that participants employ when engaged in a structured language learning activity that uses digital games?

It is hoped the answers to these questions will aid in the design of future tasks which utilize digital games for the purpose of language learning. This paper will briefly discuss the history of the project, describe the data collection process, and explain how the data is being coded and analyzed.

Introduction

This research project is a continuation of a previous RILS project (Baierschmidt, 2012) in which the researcher designed an elective class for English-language majors that utilized commercial digital games as the core content for learning. The

course, entitled "Learning English through Video Gaming" had learners engage in six self-directed language learning activities (see Baierschmidt, 2014) utilizing digital games. The initial research focused on exploring the feasibility of using digital games as the primary content of a course and also investigated learner reactions to using games for language learning purposes. This first RILS project was a modest success, with students not only enjoying the class and finding it useful to their language studies but reporting that they would continue to use digital games as language learning tools even after the class had ended (Baierschmidt, 2014; Baierschmidt, 2012).

Despite learners' positive response to the initial research, many questions still remain about utilizing digital games for language learning. Primary among these questions is what kinds of interactions learners engage in while carrying out language learning activities such as the ones used in the "Learning English through Video Gaming" class. While task design may have a strong influence on the language required to complete the task (Skehan, Foster & Mehnert, 1998) learners may also re-purpose tasks to suit their own learning goals (Ellis, 2000). This research project therefore investigated the interactions between learners during a joint language learning activity which utilized digital games and examined how those interactions were affected as the goals of the task were changed.

Team Multiplayer Activity

The Team Multiplayer activity from the "Learning English through Video Gaming" class was chosen as a focus for this investigation. In this activity, a pair of learners collaboratively play a digital game while also attempting to achieve an "English

challenge." The English challenge is a rule or goal whose purpose is to force the learners to communicate with each other in English while playing the game. For example, in a shooting game in which players must kill terrorists and attempt to rescue kidnapped hostages, a potential English challenge might be to allow only one player to shoot at enemies while the other player is only allowed to lead hostages to safety or perhaps draw enemy fire. Successful completion of such a challenge will require close cooperation and interaction between the players in order to negotiate the changing circumstances of the game. The depth and frequency of interactions required to successfully complete the Team Multiplayer activity were major factors in its selection as the focus activity in which to conduct the research.

Research Questions

The following questions were investigated during this research project:

1) What effect does introducing the Team Multiplayer activity have on interactions between learners when they are collaboratively playing a digital game?

   The primary purpose of this question is to examine in what ways interaction between learners collaboratively playing a game change after the introduction of a structured learning activity by comparing learner interactions during unstructured play to their interactions during the learning activity.

2) For each English challenge attempted during the Team Multiplayer activity,

what linguistic items (vocabulary and grammar) appear most frequently?

This question seeks to create a linguistic corpus of the vocabulary and grammar that appear during the Team Multiplayer activity and examine how the frequency of the words and grammar structures that appear in the corpus change as the English challenges are varied. It is hoped that the answers to this question will inform the design of future language learning tasks utilizing video games and allow instructors to target specific vocabulary or grammatical structures with the design of their learning tasks.

3) For each English challenge attempted during the Team Multiplayer activity, which functions of language (Jakobson, 1960) are utilized most?

While creating a linguistic corpus of the literal words learners use during an activity is useful, it provides only limited perspective into their interactions. Take, for instance, the phrase, "Well done." A player may say this to her partner to praise a skillful move. Or a player might use this phrase sarcastically to reprimand the partner for a particularly bad move. The phrase itself provides no indication about the intended interaction. Therefore, it is also necessary to analyze the language produced in terms of its context of use and intended function. This reseach question will examine the functions of language that learners use during the Team Multiplayer activity in relation to Roman Jakobson's (1960) six functions of language.

Jakobson spent much of his career refining the definitions of the six functions of language that describe how effective communication can take place: referential,

expressive, conative, poetic, phatic, and metalingual. The referential function corresponds to descriptive statements such as, "It's over there." The expressive function refers to utterances which convey the speaker's feeling such as , "Uh oh." The conative function designates speech that is designed to get a listener to do something, such as, "Please sit down." The poetic function refers to the use of language for its own sake, as is often the case in poetry. The phatic function indicates language that is used to initiate or maintain interaction, such as "Hello." The metalingual function is, as the name suggests, language used to describe language. Examples of the metalingual function of language would include the parts of speech. This research question looks at the frequency with which each of Jakobson's functions of language are used during each Team Multiplayer activity attempted by the participants and examines how those frequencies change depending on the English challenge attempted.

Participants

In order to answer these research questions, four paid participants (3 male, 1 female) between the ages of 20 and 21 were recruited from the "Learning English through Video Gaming" elective class. In interviews and a questionnaire about their gaming habits, all four participants acknowledged being avid gamers and playing video games whenever possible. However, the kinds of games they played varied by participant. Two of the male gamers played mostly first-person shooter games such as the *Call of Duty* (Infinity Ward, 2003) series of games whereas the third male participant did not enjoy such games and played mostly action-adventure games such as *The Legend of Zelda* (Nintendo, 1986) series of games. Meanwhile, the female participant particularly enjoyed action-puzzles

games such as *Puzzle Bobble* (Taito Corporation, 1994) and *Tetris* (Pajitnov & Gerasimov, 1984).

Research Design

Participants were grouped into two random pairs. Each pair was recorded for 15 minutes playing a single video game under three experimental conditions. During the first recording, participants played the game with no conditions or goals other than to learn to play the game. During the second recording, participants played the same game while engaging in the Team Multiplayer activity with a teacher-provided English challenge. During the third recording, participants played the same game while engaging in the Team Multiplayer activity with a participant-negotiated English challenge. After participants completed the recordings for one game, they were again randomly matched with a new partner and went through the recording process again using a different game. In other words, each participant played a total of two different games with two different partners and was video recorded under three experimental conditions for each game.

The games used for this project were *Ikari Warriors* (SNK, 1988) and *Jackal* (Konami, 1986). Both games are top-down shooting games, meaning the camera perspective is looking down at the players from above and players proceed from the bottom towards the top of the screen. In *Ikari Warriors*, the two players are soldiers who must fight their way through a jungle from behind enemy lines to reach a friendly village. Each player is equipped with a machine gun and grenades, both of which have limited ammunition that can only be replenished by defeating enemies. The players mostly travel by foot, although occasionally they may

commandeer enemy vehicles such as jeeps or helicopters.

In *Jackal,* players take on the role of Special Forces soldiers tasked with rescuing hostages from deep within enemy territory. Each player drives a special combat jeep equipped with a machine gun and grenades. The players use these weapons to destroy enemy soldiers and vehicles and to break holes in the walls of the prison buildings where the hostages are being held.

These games were chosen for several reasons. First, compared to modern games, these games are relatively easy to learn yet still difficult to master. Because recording time was limited, learners needed to be able to quickly learn the basics of gameplay and thus older, simpler games were preferable to more complex modern iterations. Second both games not only allow learners to play together at the same time but also provide a narrative overlay that encourages the players to work together towards common goals. Third, the participants were unlikely to be familiar with the games as the games were published before the participants were even born. Familiarity with the games was a concern as the research was more interested in focusing on the language used when participants explore a new game space together rather than the scaffolding language that might occur when one participant is familiar with the game and the other is not. A final consideration was the fact that both games were playable using PC emulators, which allowed the games themselves to be recorded using simple screen capture software available freely on the Internet.

Data Collection

Learners played the games together on a laptop PC equipped with a webcam and two USB game controllers. Learner interactions during gameplay were primarily

captured using a combination of a web camera equipped with a microphone and a video screen capture program known as Screencast-o-matic (n.d.). Using the screen capture software in conjunction with the web camera, it was possible to capture not only what learners said to each other during gameplay but also their gaze and gestures, as well as their actions within the game. Additional audio and video data of the participant interactions was collected by a back-up video camera positioned facing the participants but behind the laptop. Further data was collected by the researcher, who was present and taking notes during each recording session. The researcher was positioned at the back of the room, out of sight of the participants but still with a direct line of sight to the action occurring on the laptop screen during each recording.

As mentioned previously, each pair of participants was recorded playing a game under three different experimental conditions. During the first recording, the participants were simply instructed to play and learn the particulars of the game, with no learning outcome specified. This allowed for data to be collected about the language used during unstructured play. In the second recording participants engaged in the Team Multiplayer activity but with a researcher-provided English challenge. The researcher-provided challenges are listed below:

Table 1. Examples of teacher-provided English challenges

Pair	Game	English Challenge
1	Ikari Warriors	Only one player is allowed to use machine guns. The other player is only allowed to use grenades.
2	Jackal	One player plays the game with their eyes closed. The other player must protect them while instructing them where to move and shoot.

3	Jackal	Only one player plays the game. The other player describes what is happening as if he or she were an announcer at a sports event.
4	Ikari Warriors	Only one player is allowed to use machine guns. The other player is only allowed to use grenades.

These challenges were chosen to test out a variety of English challenges and to examine in what ways those challenges affected the interactions of the participants. The first challenge in the table above was chosen because some enemies in both of the games required either grenades or machine guns in order to be defeated. It was thought that by limiting one player to one weapon type, players would be forced to frequently negotiate their strategy as different enemies appeared on the screen.

The second challenge in the table above was chosen to investigate how introducing an information gap in the form of sensory deprivation would affect the interactions. It was believed that this challenge would require a large amount of direction giving and frequent confirmations of information.

The third challenge in the table above was chosen to see how interactions changed when one participant was able to concentrate fully on producing English without the distracting influence of having to play the game. It was predicted that this would allow the participant who was announcing to speak more fluently than when playing the game and interacting at the same time.

After attempting the teacher-completed English challenge for 15 minutes, learners restarted the game and attempted to negotiate their own English challenge. All pairs of participants tried out several different challenges before settling on the challenges listed in the table below:

Table 2. Examples of learner-negotiated gameplay challenges

Pair	Game	Challenge
1	Ikari Warriors	Both players control one character, with one player responsible for movement and the other responsible for shooting enemies.
2	Jackal	Only one player is allowed to use machine guns. The other player is only allowed to use grenades.
3	Jackal	Players are responsible for only half of the screen. For example, the first player is responsible for any enemies on the left side of the screen while the second player is responsible for any enemies on the right side.
4	Ikari Warriors	Players are responsible for only half of the screen. For example, the first player is responsible for any enemies on the left side of the screen while the second player is responsible for any enemies on the right side.

After this final video recording session, participants were asked to watch the recording and fill in a reflection worksheet. The researcher read these reflections and interviewed participants about their experiences playing the game.

Data Analysis

In total, 180 minutes of video of learners collaboratively playing digital games were recorded. The audio data from the video was transcribed using a slightly modified version of Conversation Analysis (Liddicoat, 2007) conventions. This transcription of the audio data from the video recordings took much longer than anticipated, with roughly one hour required to transcribe one minute of video. Due to the multimodal nature of the data, the video will further be transcribed using methodology suggested by Norris (2004) to allow for a fuller description of interaction through an analysis of participant gaze and gestures during gameplay

in addition to language interactions.

Once transcription is complete, a vocabulary corpus and a grammatical structure corpus will be created for each recording session. Once completed, the corpuses from the unstructured play sessions will be compared with the corpuses from structured language learning sessions to see what, if any, effect the introduction of the language learning activity had on the frequency of the vocabulary and grammar structures used by the participants. Next, the corpuses of the Team Multiplayer sessions will be compared and analyzed to see if any discernable patterns in vocabulary and grammar usage can be detected based on the English challenges used in each session. It is hoped that this analysis will provide useful information that will aid in the task design of future classroom learning activities which utilize digital games by allowing task designers to target particular words and phrases through the task structure.

In addition to the construction of vocabulary and grammatical corpuses, the original transcripts will be qualitatively coded based on Jakobson's (1960) functions of language. Once again, it is hoped that patterns or trends in the usage of certain functions of language can be correlated to particular English challenges, providing task designers with more information about how to better structure learning activities that use digital games in order to target specific functions of language.

Conclusion

While much research into the use of games for language learning has been positive, there still remain many questions about how to use games effectively in the classroom. In order to better design effective language learning tasks that

utilize games, it is necessary to investigate and record how structured learning activities influence the interactions that take place between participants. The goals of this research project are to first broadly examine the effects structured language learning activities have on participant interactions, and then explore how changing the task outcome influences learner language and interactions. It is hoped that the conclusions drawn from an analysis of the data collected will help inform future task design when creating language learning activities which utilize digital games.

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