Article

Designing and Using a Scenario-Based Digital Game to Teach Chinese Formulaic Expressions

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Abstract

A well-designed game can offer enormous opportunities for pragmatics learning by providing an immersive environment where learners can practice L2 in a variety of social contexts. To examine the applicability of gaming to L2 pragmatics learning, this study used the platform *Unity* to develop a scenario-based digital game (*Questaurant*) to teach Chinese formulaic expressions. In the game, the player took the role of a robot who works in a restaurant in China and runs quests by interacting with built-in characters. The game incorporated four key gaming attributes: *context (representation), goals, feedback,* and *interactivity.* This paper reports the usability of these gaming attributes based on interview data collected from 12 learners of Chinese who completed the game. Results showed that the combination of *context* and *interactivity* in *Questaurant* delivered an engaging learning experience, while explicit *feedback* directly contributed to learning. Participants raised some concerns regarding the motivational appeal of *goals* and implicit *feedback* in the game. This paper further discusses implications for developing and utilizing digital games for pragmatics learning.

KEYWORDS: SECOND LANGUAGE; PRAGMATICS; TECHNOLOGY; GAME; FORMULAIC EXPRESSIONS; CHINESE.

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1.   Introduction

Pragmatics represents a complex relationship among linguistic forms, their social functions, and context of use. Learning the form–function–context relationship does not come easily in a formal classroom setting where opportunities for contextualized, real-life communication are limited. In a second language (L2) classroom, learners typically do not interact with speakers in diverse social roles and situations, nor do they experience real-life consequences of their pragmatic behaviors (Bardovi-Harlig, 2019; Taguchi, 2017). Classroom materials and textbooks often lack pragmatics-focused information and activities, limiting learners' exposure to authentic samples of pragmatics (Ren & Han, 2016).

Since pragmatics learning is not likely to happen naturally in a classroom, researchers have invested in direct instruction as a way of promoting pragmatics learning (Taguchi, 2015). Existing findings show that direct instruction, especially explicit instruction that combines metapragmatic explanation, practice, and feedback, is effective for pragmatics learning. However, instructional tasks used in those studies have some limitations. One limitation is the weak contextualization of pragmatic input. Since most studies used written or audio/video-recorded interactions to introduce target pragmatic features, learners have to imagine the context of interaction, rather than directly participate in it. In addition, learner autonomy has been overlooked because learners often complete a task in a set order, rather than deciding on their course of action or reflecting on their action.

To address these limitations, this study adopted technology as an instructional tool. There has been a growing interest in examining technology-enhanced environments as a context for pragmatics learning (Gonzalez-Lloret, 2018; Taguchi & Sykes, 2013). Technology offers great potential to overcome barriers of classroom teaching by providing learners authentic contexts for meaningful interaction. As Taguchi and Roever (2017) claim, technology can "provide direct, speedy, and individualized access to situated communicative practice" (p. 195). Existing studies generally supported benefits of different kinds of technology (e.g., CMC, CALL, mobile devices) in promoting L2 pragmatics learning (see Tang, 2019, for a review). In particular, researchers have started to explore digital gaming as a site for pragmatics learning.

Following this trend, this study developed a digital game *Questaurant* to teach pragmatics in L2 Chinese. *Questaurant* was designed to supplement the existing curriculum and textbook materials to promote learning of Chinese formulaic expressions in a simulation-based, multi-modal context. *Questaurant* provided learners contextualized, goal-oriented practice of formulaic expressions while interacting with built-in characters. *Questaurant* also

enabled learners to take on a character and navigate in-game situations on their own. This paper describes the game development process, particularly the key gaming attributes of *Questaurant*. Interview data from 12 participants provide insights into the perceived usability of the gaming attributes for learning formulaic expressions in L2 Chinese.

2.   Background

2.1 Game-Based L2 Teaching

Digital gaming has gained increasing interest for its potential to engage learners and to promote effective learning (e.g., Gee, 2005, 2007; Prensky, 2007, 2012). Games can be especially beneficial for L2 learning because they can engage learners in contextualized language practice and provide an individualized learning experience (Sykes, 2016; Sykes & Reinhardt, 2012).

To illustrate the potential of game-based L2 learning, Sykes and Reinhardt (2012) proposed five parallel concepts in the intersection of game design and L2 learning activity design: goals, interaction, feedback, context, and motivation. First, games promote goal-oriented behavior by providing challenges that are scaffolded and achievable. Sykes and Reinhardt noted that the goals in games are authentic and motivating because games are fundamentally player-driven. Second, games are explicitly interactive. Games allow players to make choices and receive immediate responses. Third, games provide just-in-time, individualized feedback to guide players through the learning process. Moreover, games can provide a meaningful context for language practice. Finally, games offer an engaging and motivating experience, which is also an ideal state for L2 learning.

Several scholars have argued that games can promote L2 learning because they allow learners to use language through meaningful interaction (for a review, see Mayer, 2014; Young et al., 2012). Other scholars have emphasized the motivational appeal of games, which can be instrumental for L2 learning. Prensky (2007) states that game-based learning works because good games combine *engagement* and *interactive learning*. Games keep players motivated by providing challenges and rewards. During game play, players often experience intense mental concentration, which is referred to as the "flow" state (Csikszentmihalyi, 1990). In the flow state, the challenges that players face and their abilities to solve the challenges perfectly match so that players can accomplish complex tasks with pleasure and excitement.

Although the instructional and motivational values of games have been noted in the literature, there is a lack of understanding on what gaming features are motivating and useful for L2 learning. Games vary in the design of gaming features and the delivery of gaming experience. Motivation can result from

different types of gaming features and attributes. Since game-based learning is essentially learner-centered, it is worth exploring what gaming attributes are perceived as motivating and helpful for learning from the perspectives of learners/players. To address this issue, this study developed the game *Questaurant* incorporating four key gaming attributes: *context (representation), goals, feedback,* and *interactivity*. These attributes were selected because they are essential elements for a game (Prensky, 2007; Garris, Ahlers, & Driskell, 2002) and are also important for L2 learning (Sykes & Reinhardt, 2012).

2.2 Games for Teaching Pragmatics

A small volume of research has explored the potential benefits of game-based L2 pragmatics learning. Sykes (2009, 2013) developed the 3D immersive space *Croquelandia* to teach Spanish requests and apologies. *Croquelandia* placed learners in a study abroad context so that they could navigate a series of request and apology interactions with built-in characters. Sykes (2009, 2013) reported learners' minimal to moderate improvements on making requests and apologies after playing the game. Interview and in-class observation data showed learners' growth in their metapragmatic awareness. Sykes (2014) also analyzed learners' in-game behavior data and discussed specific design elements that assisted learning (i.e., complex, individualized in-game tasks, feedback, and opportunities for practice).

Using augmented reality, Holden and Sykes (2011) developed the mobile game *Mentira* for teaching Spanish pragmatics. In the game, players learned that their family was implicated in a murder and they had to find clues to clear their family name. The players interacted with built-in characters to find clues about the murder. They received useful clues only when their language choice was appropriate. Holden and Sykes found that participants actually "played" the game, rather than simply going through the content. They also found that a realistic setting in the augmented reality served as a means for engaging learners in pragmatic analysis and reflection. In a follow-up article, Holden and Sykes (2013) focused on the feedback mechanisms and their dynamics in games.

While *Croquelandia* and *Mentira* were specially designed for pragmatics learning, a few studies demonstrated pragmatics learning opportunities in commercially available games. Soares (2010) examined two L2 Spanish learners' participation in the popular commercial game *World of Warcraft*. It is a massively multiplayer 3D game through which players control an avatar, explore the landscape, fight monsters, complete quests, and interact with in-game characters and other players. Soares showed that the game provided a valuable space for learners to build their pragmatic skills such as greeting, leave-taking, request, and refusal. In another case study, Thorne (2008) also

investigated learner interaction occurring in *World of Warcraft*. That study showed that an American player and a Ukrainian player engaged in meaningful interaction using the target languages (i.e., English and Russian) in the gaming context. The game also provided opportunities for the players to develop interpersonal relationships with target language speakers.

Although small in volume, existing studies suggest great potential in using games for pragmatics learning (Sykes, 2016). Games are especially promising for pragmatics learning because they can provide an immersive environment where learners are exposed to a variety of social contexts. Learners can take new roles and actively engage in meaningful social interactions. Learners can also receive immediate, individualized feedback. As noted in Taguchi and Roever (2017), feedback in games helps learners notice the social consequences of their language use so they can pay attention to their linguistic choices.

While existing work points to the potential of using games for pragmatics learning, more studies are needed to test various benefits of games. As stated in Sykes and Dubreil (2019), current work on game-based pragmatics learning is still very limited. To leverage the use of digital games on L2 pragmatics, it is important to understand the affordances and challenges of different gaming attributes on pragmatics learning. The current study is an attempt to explore the usability of a digital game on the learning of formulaic expressions.

2.3 Teaching Formulaic Expressions

Although definitions vary, formulaic expressions are generally considered to be relatively fixed, conventional expressions that are tied with specific communicative situations and functions (e.g., Bardovi-Harlig, 2019). For example, in Chinese, the expression 我先走了 *wo xian zou le* ("I will go first") is often used for leave-taking at a dinner party. Formulaic expressions represent a clear connection among a linguistic form, the context where the form occurs, and the function that the form serves. The form–function–context mapping is the core of pragmatics (Taguchi & Roever, 2017). Several recent studies implemented technology-enhanced approaches to teach formulaic expressions, including corpus-based instruction (Bardovi-Harlig, Mossman, & Su, 2017; Bardovi-Harlig, Mossman, & Vellenga, 2015, Furniss, 2016) and an online interactive environment (Taguchi, Li, & Tang, 2017).

Bardovi-Harlig et al. (2015) taught formulaic expressions for academic discussions. Those expressions were extracted from Michigan Corpus of Academic Spoken English (MICASE). Students were guided to notice the expressions in context, and practiced the expressions in role play. Similarly, Furniss's (2016) study developed a corpus-referred instructional website to teach formulaic expressions in L2 Russian. Online instruction included nine modules, each containing video excerpts taken from Russian movies and

production exercises. Target formulas were selected based on an analysis of a corpus of Russian movie subtitles.

Unlike these studies using corpus-based approaches, Taguchi et al. (2017) used a video-based interactive environment to teach formulaic expressions to L2 Chinese learners. The study developed a game-like virtual environment (in *Adobe Captivate*) by using authentic videos recorded in Shanghai. The study also incorporated several gaming elements (e.g., a points system, feedback, plot, and setting). Learners interacted with video-based characters (e.g., bus driver, fruit vendor) by choosing the target formulaic expressions in multiple-choice questions (recognition practice). At the end of each scenario, learners typed in the target expressions to complete the entire dialogue (production practice).

These aforementioned studies provided learners with authentic language samples and contextualized language practice, which led to the learning of formulaic expressions. However, these studies are still limited in the ways of simulating contexts for input and output practice. In particular, these studies used pictures, video clips, or written dialogues for contextualization. Thus, learners had to imagine the contexts where formulaic expressions occur and practice them in artificial conversations (e.g., role plays). With the advancement of digital technology, we can explore new ways of simulating contexts and promoting autonomous learning. The current study is an attempt in this direction. Building on the instructional methods used in Taguchi et al. (2017), the current study also engaged learners in contextualized practice in different social scenarios. Differently, the current study provided a playful gaming experience as an attempt to increase learner engagement and learner autonomy.

This study explored the utility of a game (*Questaurant*) as a tool for teaching formulaic expressions. In particular, this study focused on learners' perceptions of four gaming attributes (i.e., *context, goals, feedback, interactivity*). Learners' actual perceptions of gaming attributes and game-based learning experience can inform us about the design principles of educational games. The study was guided by the research question: To what extent do L2 learners of Chinese perceive the game and the key gaming attributes to be motivating and useful for learning formulaic expressions?

3.   Methods1

3.1 Participants

Participants were learners of Chinese who were enrolled in college-level Chinese classes in the United States. They were volunteer participants recruited from high elementary to intermediate-level classes (third to fifth semester of Chinese study). A total of 25 students participated in the game-based learning session and 12 of them were randomly selected to participate in one-on-one

interviews. They were seven male and five female students with an average age of 20 (range: 18–27). Eight participants reported that they rarely play games, two reported they play three to four days per week, and two reported playing everyday.

3.2 Instructional Target

The game *Questaurant* was designed to teach 25 Chinese formulaic expressions in 10 social scenarios (see Appendix A). An example expression is 我随便看看 *wo suibian kankan* ("I'm just looking"). This expression is used when refusing a shop assistant's help in a mall. All expressions were adapted from two previous studies (Taguchi, Li, & Xiao, 2013; Taguchi et al., 2017).

3.3 *Questaurant* and the Key Gaming Attributes

Questaurant was developed through the gaming engine *Unity*[2] by a game development team at Carnegie Mellon University. An early prototype of the game was first created and then went through an iterative development process including many rounds of playtesting, revision, and further development. Based on the feedback collected from playtesting, the early prototype was refined and revised to increase the clarity of the content and the playability of the game. Then, a framework of the game was finalized with four key gaming attributes: *context* (i.e., story, visuals), *goals* (i.e., a rewards system), *feedback* (i.e., explicit feedback via text; implicit feedback via built-in characters' facial expressions and sound effects), and *interactivity* (i.e., in-game navigation). Once the framework was established, more game contents (e.g., artwork, game story, learning materials and codes) were added to cover all the learning materials. Once the game was complete, it was playtested with several students. A few minor changes (e.g., coding) were made based on their feedback.

In the game *Questaurant*, the learner/player takes the role of an old model robot[3] who works in a restaurant in a Chinese-speaking community (i.e., a futuristic setting where humans and robots live together, see Figure 1). The game begins when the robot's boss is about to leave town for a weekend vacation. Because the robot's language skills are rusty, the boss arranged a Buddy Bot to help the robot out. Trying to please his/her boss, the robot decides to open the restaurant and serve customers with help from Buddy Bot. In the game, different customers come up to the robot to ask for help (e.g., asking him to buy apples; see Appendix A for the details of all 10 scenarios). Figure 1 illustrates a scenario where a customer asks the robot (on the left) to buy apples to make apple pie. To run this quest, the robot has to use the target expression 苹果怎么卖? "How much are the apples?".

Figure 1. Buying apples: Practicing with the Buddy Bot (Practice Phase).

The learner/player practices formulaic expressions through three phases: Practice, Challenge, and Drag-and-Drop. Upon receiving a quest, the learner/player first practices the conversation (involving target formulaic expressions) with the Buddy Bot in the restaurant (the Practice Phase, Figure 1) and then goes out to the virtual community to interact with built-in characters using the formulaic expressions (the Challenge Phase, Figure 2). In both phases, the robot's interaction takes place through multiple-choice questions (i.e., selecting the correct formulaic expression out of four choices). After completing the Practice and Challenge Phases, the robot runs the restaurant independently, without help from Buddy Bot. This time, the robot interacts with built-in characters through Drag-and-Drop questions where the learner/player has to construct a formulaic expression (see Figure 3). During the Practice phase, the learner/player is able to freely select any response options and see the feedback from the Buddy Bot. However, the learner/player only has one chance for each quest during the Challenge and Drag-and-Drop phases.

Throughout the game the learner/player navigates the game world by running to different social scenarios (e.g., fruit stand, department store) and interacting with built-in characters (e.g., fruit vendor, shopping assistant). Figure 4 shows the robot is on his/her way to the fruit vendor. Upon completing every quest (i.e., selecting or constructing a correct formulaic expression in an interaction with a built-in character), the learner/player collects rewards. Figure 5 shows an example of the robot (learner/player) collecting nuts and bolts as a reward.

As illustrated above, four key gaming attributes were incorporated in *Questaurant*.

Figure 2. Buying apples: Interacting with the fruit vendor (Challenge Phase).

Figure 3. Buying apples: Interacting with the fruit vendor (Drag-and-Drop Phase).

1. *Context*: The game delivers *context* through a coherent storyline (a robot who tries to help customers out by running quests) and animated cartoon visuals that represent the game world and 10 different social scenarios.
2. *Goals:* The robot (learner/player) runs quests in order to gain rewards and impress his/her boss. The rewards system allows the learner to collect nuts and bolts, increase their score, and collect items (e.g., flower, TV) to decorate the restaurant.
3. *Feedback*: In multiple-choice questions and Drag-and-Drop questions, the learner/player receives explicit feedback via text, and implicit feedback via built-in characters' facial expressions and sound effects. Explicit

Figure 4. Navigating in the game world.

Figure 5. Collecting nuts and bolts.

feedback contains metapragmatic explanations on the learner's errone-
ous language choices (i.e., pragmalinguistic, sociopragmatic, or idio-
syncratic error). Implicit feedback provides social emotional responses
through different facial expressions of built-in characters (e.g., happy,
upset) and sound effects (i.e., positive, negative).

4. *Interactivity*: The learner/player navigates the game world and inter-
acts with built-in characters in different scenarios. The game allows
the learner to interact with game objects and to control their own
progress.

3.4 Interview

Individual interviews were conducted with 12 participants to examine their game-based learning experience. The interview was semi-structured with open-ended questions (see below). When questions were asked, the words of key gaming attributes were replaced by concrete explanations (e.g., *context* as "the story and the visuals"; *goals* as "the rewards you received in the game"). Follow-up questions were asked based on participants' responses:

1. Do you consider the learning practice as a game or game-like experience?
2. Do you consider these gaming attributes (i.e., *context, goals, feedback,* and *interactivity*) motivating? Why or why not?
3. What other features of the game were engaging or disengaging?
4. Do you consider these gaming attributes (i.e., *context, goals, feedback,* and *interactivity*) helpful for your learning? Why or why not?
5. What other features of the game were helpful or not helpful for your learning?

3.5 Data Collection and Analysis

Participants completed an entire sequence of the game in one day in a computer lab on campus at their own pace (40–60 minutes). After completing the game they participated in a one-to-one interview. Interviews ranged from 8 to 20 minutes in English, and were audio-recorded and transcribed. The first author conducted a content analysis of the interview transcriptions. The software NVivo was used to assist the coding and analysis of interview data. Participants' responses to each interview question were analyzed for recurring patterns, which were summarized as notable trends. To answer the research question, the interview data were coded for the motivational appeals and usefulness of four key gaming attributes (i.e., *context, goals, feedback,* and *interactivity*).

4. Results

Interview data showed that participants perceived the practice as an authentic *learning* game. The key gaming attributes (i.e., *context, goals, feedback,* and *interactivity*) all contributed to participants' game-like experience. Due to space constraints, the analysis here focuses on the motivational and usefulness aspects of the game.

4.1 The Motivational Aspect of the Key Gaming Attributes

Context. Most participants (75%, nine out of 12) thought that the *context* (i.e., story, characters, visuals) of the game was motivating/engaging[4] because it

immersed them into the situation and gave them a purpose of doing things. For example, as Excerpt 1 shows, Joe[5] felt that the embodiment of a new character gave him a strong sense of engagement. Joe thought that the personalized story made the game motivating.

> The story, I think that just like what I said before is that because he's got this like personalization aspect. You are like you embodied this character and then you're like okay like I'm into in this. I'm getting the help of this like buddy assistance. And then like uh it makes you feel engaged. Accountability to some virtual roles. That makes the story engaging cause I wanted to see how the characters evolve. (Excerpt 1)

Some participants thought that the *context* made the learning experience "fun". For example, Jean (who played games regularly in her free time) felt that the context made her feel like she was "playing a video game", and she was actually able to apply her video game skills in playing *Questaurant*.

Three participants did not think the *context* was engaging because they did not like the story. For example, Henry thought some of the quests the robot ran (e.g., asking a professor for a make-up test) were "bizarre". He also thought it was not clear why certain things happened (e.g., robot living among humans, robot going to a party) in the game story.

Goals. About half of the participants (42%, five out of 12) thought that the *goals* were motivating/engaging because goals gave them incentives to play and learn. For example, Ethan thought that collecting rewards was "the most satisfying thing". Emmy said that *goals* gave her "the motivation to get it [the answer] right". Collecting rewards was engaging because learners gained more of them when they did better, satisfying their competitive spirit.

However, other participants (42%, five out of 12) did not think the *goals* of collecting rewards (e.g., nuts and bolts, restaurant decoration) were engaging mostly because there was not much at stake. Mason offered insightful comments on the challenges of building a motivating reward system in educational games (Excerpt 2). He thought that the rewards in *Questaurant* were "kind of meaningless". He reported that it is not possible to build a truly engaging rewards system without sacrificing the learning portion because, after all, the main purpose of an educational game is learning, not winning. It is worth noting that Mason was one of the four participants who played games regularly in their free time. He also participated in a game creation club on campus to develop games.

> So it's not like you can really create a motivating factor in a rewards system. They're kind of like, **they're kind of meaningless** …**Learning games kind of close off all the things**. Like if you look at RPG games or like stuff where you build up on your

character, they um … it's like … it's kind of … it's very **dopamine driven** so you have um you're like fighting monsters or you're doing things and it's like, it's more engaging because it's not a learning game. Like you – **I don't think you can actually make a learning game that is that engaging without sacrificing a significant portion of the learning**. (Excerpt 2)

Feedback. Most participants found it difficult to make a direct connection between the feedback and their motivation/engagement in the game. Only four participants commented on this aspect, reporting that the feedback, especially the sound effects, was engaging. They noticed the sound effects (a positive sound for each correct answer and a negative sound for each incorrect answer), which were motivating. As Jenny put it, "I feel like you could ignore the characters' facial expressions. The sound was engaging." As this comment (and similar comments from other participants) illustrates, most participants did not notice the implicit feedback, especially different facial expressions of built-in characters (e.g., a happy face following a correct response and an upset or confused face following an incorrect response). Instead, they only noticed the explicit feedback delivered via text.

Interactivity. Ten participants reported that their interaction in the game was engaging. They especially liked the feature of walking around in the game world and exploring different social situations. Participants talked about how *interactivity* made the game a real game instead of a "test with some graphics" or "something out of a textbook". For example, Anne liked moving around in the game world because it kept her "engaged" (Excerpt 3).

Ya, I think that's [interactivity] engaging. **I think it wouldn't be as interesting if it was just in one spot the whole time** and if you didn't have to like click through, you might like lose interest if just kind of runs through. Ya so **I liked the moving around**, **the using the different keys, the clicking, the moving the mouse**. I think that like definitely stays, **I stayed engaged**. (Excerpt 3)

One participant (Austin) thought that the interaction could be improved by allowing more options for players to choose from to determine their course of action. He recommended having different dialogues available as options at the same time, rather than displaying them one-by-one. Austin's comment points to the linear and structured path of the game.

To sum up, participants thought that the *context* and *interactivity* were motivating and engaging because they placed learners in situations where they were able to interact with built-in characters. However, participants' perceptions of *goals* (i.e., rewards) varied. While the *goals* provided incentives for some learners, the link between "incentives to play" and "incentives to learn" is

not straightforward, as half of the participants did not find the *goals* engaging. Moreover, participants' responses on the motivational aspect of *feedback* were limited because most of them did not notice the implicit feedback, especially from built-in characters' facial expressions.

4.2 The Usefulness of the Key Gaming Attributes for Learning

Context. Participants (75%, nine) thought that the *context* was helpful because it provided the social scenarios with immersive experience. As shown in Excerpt 4, Jenny said that the visuals and immersive experience in *Questaurant* made her feel "more realistic" when practicing the expressions.

> "Yeah, it's [context] helpful for learning. **It's more than just like if you were to let sit in a room and try to pretend like you're at a store**. That's different. You see a store. I like the **images** in the game **because I feel more realistic to move something**. **It's better than just seeing a picture on paper**." (Excerpt 4)

Another participant (Emmy) thought that the visuals were helpful because she was "a visual learner". Hence, the game seemed to appeal to learners with different learning styles since it presented a multi-modal environment. Two participants expressed reservations about the helpfulness of *context*, although they were unable to explain why *context* was not helpful.

Goals. Half of the participants opted out of answering/responding to this question. Most participants seemed to be only able to connect *goals* with the motivational aspect of game instead of learning. Among those who did speak to this aspect, most of them (33%, four) thought that the *goals* were helpful because it provided incentives to learn or to play the game. However, two participants had mixed feelings about the learning benefits of the *goals*. As shown in Excerpt 5, Aaron thought that rewards were "engaging" because he tried to get as many nuts as possible. Yet he was afraid that collecting rewards might be "distracting" from learning.

> **It [collecting rewards] was engaging. But it wasn't making me think about learning Chinese.** I mean it's kind of a **mixed**. On one hand, yes, it's making me thinking about the game which is making me more engaged in the game, **maybe making me more attracted in learning Chinese**. But on the other hand, maybe if I'm thinking about my fine motor skills here, maybe it's **distracting** from learning. I certainly wanted to get more points. (Excerpt 5)

Feedback. Among all four gaming attributes, *feedback* elicited the most comments from participants in terms of the *helpfulness* for learning. Participants (75%) thought that the explicit text feedback was very helpful. They

liked receiving specific feedback that directly explained the error types (i.e., pragmalinguistic or sociopragmatic errors). The comment from Alissa in Excerpt 6 shows how learners were able to learn target expressions from specific feedback.

> [Interviewer: how about the feedback you received in the game?] I thought that was helpful, especially when it gave like **an explanation of like why**, not just said it was wrong, it would say like this is **too informal**, or like this is **not like the correct grammar structure**, and so like that kind of like **would help you understand it better**, so I thought that was a good aspect to it. (Excerpt 6)

Three participants did not consider *feedback* helpful because it was too vague. They pointed out that the feedback messages on the idiosyncratic errors were generic (e.g., This is not how native speakers would say it), without specific information.

Interactivity. Eight participants (67%) thought that the interaction in the game was helpful for learning from three perspectives: (1) the learning system built into the game was helpful because it scaffolded the learning process; (2) the in-game interaction helped them focus on the learning process; and (3) the interaction showed them how to apply what they were learning to actual social interaction. These perspectives showed that in-game interaction occurred at different dimensions. Among them, Joe's comment (Except 7) illustrated how learners can benefit from learning through the scaffolded activities in *Questaurant*. Joe thought he could learn better from the repetition in the game than from a textbook. This was because the game gave learners feedback based on how they "performed", whereas when learning from a textbook, learners might not be aware of when they actually grasped the content.

> For those things that you have to memorize, it was helpful to have **that repetition and then just sort of like the spacing in the game**. Maybe that could have been a little more challenging to get from a textbook version. The repetition … in a textbook, I read it once I'm like oh I get this. Then I'm like I don't need to repeat it. But in reality it's like I haven't memorized it yet. So in that case, **the interaction in game is helpful for learning, in terms of uh giving me the feedback or assigning me problems rather than letting me trying to decide whether to practice based on what I think I know**. They would give me practice and feedback based on how I **performed** through this. (Excerpt 7)

Two participants (17%) did not think that the *interactivity* was particularly helpful for learning. One of them suggested adding more content and complexity to the game by including more than 10 social scenarios.

To sum up, participants thought *context*, *feedback*, and *interactivity* were helpful for learning and had mixed feelings about *goals*. While explicit *feedback* provided direct metapragmatic explanation on learners' language choices, *context* and *interactivity* in *Questaurant* presented an immersive environment for active learning. Some learners raised concerns of the *goals* (rewards) being potentially distracting from learning.

5.   Discussion

This study developed and implemented the scenario-based game *Questaurant* for learning formulaic expressions and showed learners' perceptions of a game-based learning experience. As described above, the combination of the key gaming attributes delivered an engaging learning experience. Findings of this study provide critical insights for developing and utilizing digital games for pragmatics learning.

First, *context* and *interactivity* were perceived positively as both engaging/motivating and helpful for learning. Both attributes worked together in providing an immersive, active learning experience. While *context* vividly presented the social scenarios in front of learners, *interactivity* allowed learners to take on a new role and actively practice language use through interacting with built-in characters. Both of these are essential for pragmatics learning. These findings correspond to what Young et al. (2012) noted, that video games might be particularly beneficial for L2 learning because they present an immersive social environment with interactive dialogues.

Second, among the four key gaming attributes, participants viewed the explicit *feedback* as especially beneficial for learning because they were able to learn why a certain expression was incorrect or inappropriate. As Prensky (2007) put it, "it is from the feedback in a game that learning takes place" (p. 121). In *Questaurant*, learners received individualized feedback immediately after they made every language choice (through multiple-choice or Drag-and-Drop). As shown in the interview, learners paid close attention to the explicit metapragmatic feedback and subsequently increased their pragmatic awareness (i.e., understanding the correctness and appropriateness of their language choice).

However, *feedback* was not perceived as an engaging feature because most of the learners did not notice the implicit *feedback* delivered through built-in characters' facial expressions. In *Questaurant*, each built-in character was designed with five different states of facial expression (i.e., neutral, happy, confused, upset, and awkward) to correspond to learners' different language choices. These were incorporated to provide affectively rich feedback to indicate the social consequences of language use. In the game, both the explicit

feedback and the implicit feedback were shown at the same time after learners completed each quest. However, learners only paid attention to the explicit text feedback, probably because it was more salient and important for their progress in the game. These findings echo what Holden and Sykes (2013) noted in their development of *Mentira*, an augmented reality mobile game developed for learning Spanish. During early iterations of the game, Holden and Sykes observed that learners did not notice the subtle responses coming from built-in characters at first (i.e., built-in characters' reactions to learners' language choices). Therefore, in further iterations, they made in-game feedback more obvious and exaggerated. As Holden and Sykes (2013) emphasized, "saliency is critical to any type of in-game feedback being given" (p. 172). The current study further demonstrated the importance of making the in-game feedback salient to learners. To highlight the social consequences of pragmatic choices, the affective feedback in game can be provided through exaggerated reactions of built-in characters, through facial expressions, gestures, and behaviors (e.g., walking away).

Third, *goals* received mixed reactions from the participants. The rewards system in *Questaurant* provided strong incentives for some learners but was somewhat meaningless for others. While rewards encouraged some learners to work harder to learn, concern was also raised about the rewards possibly distracting from learning or not engaging. These mixed and unclear views showed the constraints of the *goals* in *Questaurant*. They also indicated the complexity and challenges of designing a truly engaging, goal-oriented educational game. As shown in the results, a rewards system itself did not automatically deliver a dynamic goal-oriented gaming experience. Although *Questaurant* was designed to incorporate different layers of *goals* (e.g., running quests to make the boss proud, collecting nuts), only the rewards of collecting nuts and bolts stood out as an explicit goal in the game. Thus, the *goals* could be further developed to involve more complexity and to be more engaging. For example, if *Questaurant* involved a more complex storyline with gradual development of the characters (e.g., robot) or provided options for branched stories, the *goals* in the game could be much more engaging. Another possibility is to incorporate a level design into the current rewards system to make it more meaningful. A level design could set threshold levels that would only allow the learner/player to unlock the next level (e.g., new scenarios) if they have gained a certain amount of rewards. Or, the rewards system could include a ranking board that features the top few users with the highest scores to increase competition among students. Thus, a dynamic and meaningful rewards system should be designed to enhance the goal-oriented nature of a game.

This study showed how a scenario-based game can be developed and successfully implemented for L2 pragmatics learning. As mentioned above, while

Questaurant was perceived positively as a learning game, several features such as implicit feedback, the rewards system, and game story can be further developed to enhance the motivational appeal of the game. Here, it is worth noting that these constraints of *Questaurant* mostly referred to the limitations of the game compared to a recreational game. However, *Questaurant* was not designed to be a recreational game. Although some features of recreational games can be used in an educational game to increase the motivational appeal, an educational game has its clear objectives of delivering instructional materials to promote learning outcomes. Hence, further discussion is necessary to determine how entertaining an educational game should be. In particular, game-based pragmatics learning calls for further investigation into what features of a recreational game should be adapted in designing and developing a game for language learning.

This study indicated the potential of incorporating game-like features in developing instructional materials for pragmatics learning. Although classroom instructors may not have adequate resources to develop games, the concepts of gaming attributes used in this study can be applied to designing regular instructional activities to make them more engaging. For example, classroom instructors can provide *context* of language learning by using a variety of multimedia resources (e.g., pictures, videos, websites). Instructors can also explore different ways to incorporate game-like *goals* in a learning activity by using a rewards system or creating competition among students. *Feedback* to students' erroneous language use should be provided in a timely, explicit, and meaningful manner. The gaming attribute *interactivity* can be incorporated into classroom activities by allowing students to actively use the target language to solve real-life problems.

6.   Limitations and Implications

One limitation of this study was that learners played the game in a controlled laboratory setting in a university. The laboratory setting might not be ideal for assessing the real effect of game-based learning due to the lack of authenticity in game playing. Future studies would benefit from examining the effects of game-based learning in a more ecological manner. For example, a game could be assigned as homework for students to complete outside the class. Additionally, this study only involved about one hour of playing/learning time. A longitudinal design to investigate learners' perceptions of game-based learning would add significant insight into the issues discussed here. Another limitation was related to the development of *Questaurant*. In addition to the constraints mentioned above (e.g., implicit feedback, rewards), *Questaurant* only allowed practicing formulaic expressions through reading, not through

listening or speaking. This was due to the technical difficulties in automatically detecting learners' speech and providing meaningful feedback. However, formulaic expressions are typically used in spoken communication in daily life. An ideal game should allow learners to interact with built-in characters through listening and speaking in a conversation. With the advancement of natural language processing, language learning games should try to incorporate listening and speaking practices in the future. Future research should make an effort to fully implement different modalities and gaming features to further explore the instructional and motivational potentials of game-based pragmatics learning.

Notes

1. This study is part of the first author's dissertation that examined the effectiveness of game-based learning by comparing learning outcomes between an experimental group who received game-based instruction and a comparison group who received a regular online instruction. Due to space limitations, this paper only reports findings related to the experimental group's perceptions of the game.

2. Unity is a game development platform that is primarily used to develop 3D and 2D video games for computers, consoles, and mobile devices.

3. The role of a robot was used in the game mostly for recreational reasons. An old model robot is supposed to be unfamiliar with the correct and appropriate use of language.

4. "Engagement" was operationalized as learners' motivational levels during the game. It was measured through four dimensions in the main study: attention, relevance, confidence, and satisfaction. In the current paper, the word "engaging" instead of "motivating" was used during the interview because participants found it easier to connect to it.

5. All participant names used in this paper are pseudonyms.

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References

Bardovi-Harlig, K. (2019). Routines in L2 pragmatics research. In N. Taguchi (Eds.), *The Routledge handbook of second language acquisition and pragmatics* (pp. 47–62). New York, NY: Routledge. https://doi.org/10.4324/9781351164085-4

Bardovi-Harlig, K., Mossman, S., & Su, Y. (2017). The effect of corpus-based instruction on pragmatic routines. *Language Learning & Technology, 21*(3), 76–103.

Bardovi-Harlig, K., Mossman, S., & Vellenga, H. E. (2015). The effect of instruction on pragmatic routines in academic discussion. *Language Teaching Research, 19*, 324–350. https://doi.org/10.1177/1362168814541739

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York, NY: Harper & Row.

Furniss, E. A. (2016). Teaching the pragmatics of Russian conversation using a corpus-referred website. *Language Learning & Technology, 20*(2), 38–60.

Garris, R., Ahlers, R., & Driskell, J. E. (2002). Games, motivation, and learning: A research and practice model. *Simulation & gaming, 33*(4), 441–467. https://doi.org/10.1177/1046878102238607

Gee, J. P. (2005). Learning by design: Good video games as learning machines. *E-learning and Digital Media, 2*(1), 5–16. https://doi.org/10.2304/elea.2005.2.1.5

Gee, J. P. (2007). *Good video games and good learning*. New York, NY: Peter Lang. https://doi.org/10.3726/978-1-4539-1162-4

Gonzalez-Lloret, M. (2018). Pragmatics in technology-mediated contexts. In A. Sanchez-Harmandez & A. Heraiz-Martinez (Eds.), *Learning second language pragmatics beyond traditional contexts* (pp. 17–48). Berlin, Germany: Peter Lang.

Holden, C. L., & Sykes, J. M. (2011). Leveraging mobile games for place-based language learning. *International Journal of Game-Based Learning (IJGBL), 1*(2), 1–18. https://doi.org/10.4018/ijgbl.2011040101

Holden, C. L., & Sykes, J. M. (2013). Complex L2 pragmatic feedback via place-based mobile games. In N. Taguchi & J. M. Sykes (Eds.), *Technology and interlanguage pragmatics research and teaching* (pp. 155–184). Amsterdam, The Netherlands: John Benjamins. https://doi.org/10.1075/lllt.36.09hol

Mayer, R. E. (2014). *Computer games for learning: An evidence-based approach*. Cambridge, MA: MIT Press. https://doi.org/10.7551/mitpress/9427.001.0001

Prensky, M. (2007). *Digital game-based learning*. New York, NY: McGraw-Hill.

Prensky, M. (2012). *From digital natives to digital wisdom: Hopeful essays for 21st century learning.* Thousand Oaks, CA: Corwin Press. https://doi.org/10.4135/9781483387765

Ren, W., & Han, Z. (2016). The representation of pragmatic knowledge in recent ELT textbooks. *Elt Journal, 70*(4), 424–434. https://doi.org/10.1093/elt/ccw010

Soares, D. (2010). Second language pragmatic socialization in World of Warcraft (Unpublished doctoral dissertation). University of California, Davis.

Sykes, J. M. (2009). Learner requests in Spanish: Examining the potential of multiuser virtual environments for L2 pragmatics acquisition. In L. Lomicka & G. Lord (Eds.), *The next generation: Social networking and online collaboration* (pp. 119–234). San Marcos, TX: CALICO.

Sykes, J. M. (2013). Multiuser virtual environments: Learner apologies in Spanish. In N. Taguchi & J. M. Sykes (Eds.), *Technology and interlanguage pragmatics research and teaching* (pp. 71–100). Amsterdam, The Netherlands: John Benjamins. https://doi.org/10.1075/lllt.36.05syk

Sykes, J. M. (2014). TBLT and synthetic immersive environments: What can in-game task restarts tell us about design and implementation. In M. González-Lloret & L. Ortega (Eds.), *Technology-mediated TBLT: Researching technology and tasks* (pp. 149–182). Amsterdam, The Netherlands: John Benjamins. https://doi.org/10.1075/tblt.6.06syk

Sykes, J. M. (2016). Technologies for teaching and learning intercultural competence and interlanguage pragmatics. In C. A. Chapelle & S. Sauro (Eds.), *The handbook of technology and second language teaching and learning* (pp. 119–133). New York, NY: Wiley-Blackwell. https://doi.org/10.1002/9781118914069.ch9

Sykes, J. M., & Dubreil, S. (2019). Pragmatics learning in digital games and virtual environments. In N. Taguchi (Eds.), The *Routledge handbook of second language acquisition and pragmatics* (pp. 387–399). New York, NY: Routledge. https://doi.org/10.4324/9781351164085-25

Sykes, J. M., & Reinhardt, J. (2012). *Language at play: Digital games in second and foreign language teaching and learning.* Boston, MA: Pearson Education.

Taguchi, N. (2015). "Contextually" speaking: A survey of pragmatic learning abroad, in class, and online. *System, 48*, 3–20. https://doi.org/10.1016/j.system.2014.09.001

Taguchi, N. (2017). Interlanguage pragmatics. In A. Barron, P. Grundy, & G. Yueguo (Eds.), *The Routledge handbook of pragmatics* (pp. 153–167). Oxford, England: Routledge. https://doi.org/10.4324/9781315668925-14

Taguchi, N., & Roever, C. (2017). *Second language pragmatics.* Oxford, England: Oxford University Press.

Taguchi, N., & Sykes, J. M. (Eds.). (2013). *Technology in interlanguage pragmatics research and teaching.* Philadelphia, PA: John Benjamins. https://doi.org/10.1075/lllt.36

Taguchi, N., Li, Q., & Tang, X. (2017). Learning Chinese formulaic expressions in a scenario-based interactive environment. *Foreign Language Annals*, *50*(4), 641–660. https://doi.org/10.1111/flan.12292

Taguchi, N., Li, S., & Xiao, F. (2013). Production of formulaic expressions in L2 Chinese: A developmental investigation in a study abroad context. *Chinese as a Second Language Research, 2*(1), 23–58. https://doi.org/10.1515/caslar-2013-0021

Tang, X. (2019). Use of technology for learning second language pragmatics. *Applied Language Learning, 29*(1&2), 52–72.

Thorne, S. L. (2008). Transcultural communication in open internet environments and massively multiplayer online games. In S. Magnan (Eds.), *Mediating discourse online* (pp. 305–327). Amsterdam, The Netherlands: John Benjamins. https://doi.org/10.1075/aals.3.17tho

Young, M. F., Slota, S., Cutter, A. B., Jalette, G., Mullin, G., Lai, B., Simeoni, Z., Tran, M., & Yukhymenko, M. (2012). Our princess is in another castle: A review of trends in serious gaming for education. *Review of Educational Research, 82*(1), 61–89. https://doi.org/10.3102/0034654312436980

Appendix A

Table 1

Target Formulaic Expressions, Situations, and Communicative Functions

Situation	Communicative Functions	Formulaic Expressions	English Translation
Withdrawing money in a bank	Asking the bank teller to withdraw xxx RMB.	我想取xxx(块钱)。	I would like to withdraw xxx (yuan).
Bargaining at a fruit stand	Asking the price of xxx.	(请问) xxx怎么卖？	(May I ask) how much is xxx?
	Asking the vendor to lower the price.	便宜点儿吧。	A bit cheaper.
Shopping in a department store	Responding to the shop assistant that you're just browsing.	(我)随便看看。	I'm just looking.
	Asking for the price of xxx.	这件xxx多少钱？	How much is xxx?
	Asking if you can try xxx on.	我可以试一下xxx吗？	Can I try xxx on?
	Asking if you can use a credit card.	可以{用/刷}信用卡吗？	Can I use a credit card?
	Asking where the cashier is.	收款台在哪儿？	Where is the cashier?
Asking for the bus route	Asking if the bus goes to xxx.	(师傅)，(请问)，到xxx吗？	(Sir), (excuse me), do you go to xxx?
	Asking which bus goes to xxx.	(那)(请问)哪辆车去xxx？	(Then) (excuse me), which bus goes to xxx?
Asking to take an empty seat	Asking if there is an empty seat.	(请问) 这里有人(坐)吗？	(Excuse me), does anyone sit here?
	Asking if you can take the empty seat.	(那)(请问)我可以坐这儿吗？	(Then) can I sit here?
Making a request with a professor	Asking to take a make-up test.	我可不可以补考呢？	Can I take a make-up test?
	Thanking the professor.	太谢谢您了。	Thank you so much.
	Leave taking.	(那) 我先走了。	I should get going.
Making and ending a phone call	Telling the speaker that they dialed the wrong number.	你打错了。	You dialed the wrong number.
	Ending a phone call.	(就)(先)这样吧。	That is it. [Just this way.]
Leaving a party early	Apologizing for being late.	不好意思，(我) 来晚了。	Sorry, I am late.
	Apologizing for leaving early.	(我)得先走了。	I have to leave (first).
Asking directions on the street	Passing a crowd.	{麻烦/请}让一下。	(Please) yield a bit.
	Asking a stranger for directions to go to xxx.	请问xxx怎么走？	Excuse me, how do I get to xxx?
	Asking the distance.	(大概)要多久？	How long does it take (approximately)?
Eating in a restaurant with a friend	Asking your friend what she wants to eat.	你想吃(点)什么？	What would you like to eat?
	Ordering xxx.	{来/要}个xxx。	Order a xxx.
	Asking to pack up leftovers.	打包。	Wrap it up.

Note. The elements in { } indicate alternation; ( ) show optional elements; [ ] indicate the literal meaning of the expression.