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Keywords
ESL, simulations, The Sims, L2 vocabulary, computer games

Disciplines
Bilingual, Multilingual, and Multicultural Education | Curriculum and Instruction | Educational Methods | Instructional Media Design

Comments
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Abstract

With their realistic animation, complex scenarios and impressive interactivity, computer simulation games might be able to provide context-rich, cognitively engaging virtual environments for language learning. However, simulation games designed for L2 learners are in short supply. As an alternative, could games designed for the mass-market be enhanced with support materials to allow students to enter and make use of them for learning? This classroom-based investigation looked into whether the best selling game *The SIMs™* could be rendered pedagogically beneficial to university-level ESL learners by means of supplementary materials designed to meet Chapelle's (2001) criteria for CALL task appropriateness. The mixed-methods study found statistically significant improvements in vocabulary knowledge, as well as a generally positive reaction to the modifications among users.

Introduction

Computer-based simulation games are becoming increasingly realistic and interactive, which has increased discussion about their potential for language learning (Coleman, 2002b; Crookall, 2002; Purushotma, 2005). Much of the discussion has focused on their ability to provide engaging substitutes for real-life experience to learners who, without leaving the comfort of their desks, enter virtual worlds rich in opportunities for linguistic exposure and communicative practice. Such games can be highly motivating – even addicting – but their language-learning potential has gone largely unrealized because games designed specifically for L2 instruction are in short supply, due largely to competition from the entertainment-oriented commercial sector (Purushotma, 2005).

A study by Miller and Hegelheimer (2006) investigated whether structured play of the original version of *The Sims,* combined with specially-designed support materials, could allow L2 learners of English not only to use the game but also to enhance their grammar and vocabulary knowledge. The researchers found statistically significant increases in vocabulary

knowledge of 30 words learners had been exposed to in the study. The present mixed-methods investigation attempted to replicate these findings while at the same time seeking additional information about the participants' response to the supplementary materials and modified mode of play, as well as their perceptions of the game and its potential as a language-learning tool.

Related work

SIMULATIONS IN LANGUAGE LEARNING

Simulations have been promoted for use in language learning for decades, first in their original, paper-based form and later as computer-based activities. They are said to benefit learners by promoting language use in highly specific contexts (as opposed to abstracting it for analysis and practice) in line with the concept of situated cognition (Brown, Collins, & Duguid, 1989). Simulations are said to promote metacognitive strategy use (Bullard, 1990) and to foster strategic and communicative competence by helping learners assess the characteristics of a language-use situation, set communicative goals, plan responses, and control the execution of their plans (Gastão Saliés, 2002). They have also been promoted as tools for fostering cross-cultural communication (Crookall, Coote, Dumas, & Le Gat, 1987; Crookall & Oxford, 1990; Nemitcheva, 1995). In addition, having students take on roles in a simulation can reduce the fear of making mistakes and thus lower affective barriers to acquisition (K. Jones, 1982; Nemitcheva, 1995). Simulations are learner-centered insofar as they give students the opportunity to resolve problems without the "authoritative persuasion" of a teacher (Freiermuth, 2002, p. 187). They can also make coursework more engaging by providing instrumental motivation that arises "out of the function, the duties, the responsibilities and circumstances in which the participants find themselves" (K. Jones, 1982, p. 10).

Computer-based simulations in particular can provide content for language learning that is "naturally rich in associations" via cohesive, meaningful contexts (Purushotma, 2005, p. 84). They can also present scenarios in real time and give instantaneous feedback (G. Jones, 1986). Computer simulations can help bridge the distance between students and the target-language culture and thereby provide realistic sociocultural contexts for language learning (Schwienhorst, 2002). With respect to affective barriers, computer simulations

incorporating synchronous chat can also motivate learners who would be normally shy in face-to-face interaction to take part more actively (Freiermuth, 2002).

Some applied linguists have suggested guidelines for classroom use of simulations. Jones (1982), Higgins and Johns (1984), Balajthy (1984), and Garris, Ahlers and Driskell (2002) agree that briefing sessions are needed before simulations and debriefing sessions afterward. (Briefing allows for planning time, linguistic preparation, role and task familiarization, etc. while debriefing gives participants a chance to draw lessons from their experience and consolidate learning.) As with any learning activity, simulations must also contribute to curricular goals and be appropriate for a given group of learners (Carrier, 1991; K. Jones, 1982; Thurman, 1993). Regarding the use of computer simulations in particular, Balajthy (1984), Carrier (1991) and Coleman (2002a) agree that students should work in small groups to foster cooperative learning and to enhance opportunities for language use.

ADAPTING MASS-MARKET SIMULATION GAMES FOR CALL

The significant potential of computer simulation games for language learning has nevertheless failed to translate into widely available products. According to Purushotma (2005), the development of L2 learning-oriented games has suffered because of competition from the commercial gaming sector, which unlike educational developers is able to shoulder the high development costs and long production cycles required to produce a game like The SIMs. This has compelled some researchers to investigate opportunities for adapting commercially produced games via the use supplementary materials and modified modes of play (Coleman, 2002b; Miller & Hegelheimer, 2006). This was the approach adopted in the present study.

Such an approach should obviously be based on sound second language acquisition theory. Following Miller and Hegelheimer (2006), this investigation therefore consulted Chapelle's framework for evaluating CALL task appropriateness (Table 1).

Table 1: Criteria for CALL Task Appropriateness (Chapelle, 2001, p. 255)

Language learning potential	The degree of opportunity for beneficial focus on form
Learner fit	The amount of opportunity for engagement with language under

	appropriate conditions given learner characteristics
Meaning focus	The extent to which learners' attention is directed toward the meaning of the language
Authenticity	The degree of correspondence between the CALL activity and target language activities of interest to learners out of the classroom
Positive impact	The positive effects of the CALL activity on those who participate in it
Practicality	The adequacy of resources to support the use of the CALL activity

Noting that The SIMs by itself is inappropriate as a CALL task, Miller and Hegelheimer (2006) devised the following innovations based on Chapelle's guidelines: 1) instructions for accomplishing specific tasks; 2) vocabulary lists and related practice material for unfamiliar words the participants were likely to encounter; 3) explanatory notes on the game's cultural content; 4) access to an online dictionary; and 5) an opportunity to play the game collaboratively with other learners. (SHOULD I MENTION WHY I'VE EXCLUDED GRAMMAR FROM THE REPLICATION?) A revised evaluation of The Sims used in combination with these supplementary materials is provided in Table 2. The same adaptations were used in the present study.

Table 2: Evaluation of The Sims with pedagogical modifications (Miller & Hegelheimer, 2006)

Criteria for CALL task appropriateness	***The Sims* without supplementary materials**	***The Sims* with supplementary materials, as used in this study**
Language learning potential	No focus on form	Specific vocabulary … and cultural features made salient through pre-task activities
Learner fit	Appropriate for teens and adults	Intermediate-advanced language learners (informed by linguistic analysis of text)
Meaning focus	Focus of the task is to create and maintain characters	Focus of the task is to create and maintain characters. Additional instructions provide more specific tasks for each day.
Authenticity	A popular game outside of the classroom focused on life activities (marriage, children, work, etc); U.S. culture	Remains authentic; purpose-driven interactions with classmates
Positive impact	Highly motivational [according to] sales records. Learning impact unknown.	Evaluated through quizzes and questionnaires
Practicality	Computer and software [required]	Software and two computers for each group (one for the game and one for supplemental materials) [required]

VOCABULARY AND CALL

In selecting a language focus for this study, vocabulary was deemed appropriate for two main reasons. Firstly, The SIMs seems to lend itself to vocabulary learning by virtue of the abundance of useful, everyday objects, actions and situations learners are exposed to in the game environment, particularly words related to the home, furniture, as well as personality adjectives and simple action verbs appropriate to lower level ELS learners. Moreover, this exposure can be characterized as a type of multimedia annotation insofar as elements in the game environment (images, sounds, animation, a character's behavior, etc.) help establish lexical meaning. A number of L2 studies have found that multimedia-enhanced annotation of vocabulary items in CALL environments leads to higher rates of retention and recall (Al-Seghayer, 2001; Chun & Plass, 1996).

Secondly, simulations can be said to contribute in a unique way to vocabulary acquisition as defined by the construct of *involvement load*, which has been has proposed as an alternative to the incidental v. intentional learning distinction often discussed in the L2 vocabulary acquisition literature. Hulstijn (2001) asserts that in vocabulary acquisition, a more important factor than intention to learn is the amount and quality of *elaboration*, or cognitive engagement, a learner has with a particular vocabulary item. On the basis of this insight, Hulstijn and Laufer (2001) introduced the concept of involvement load to connect the cognitive and motivational facets of vocabulary learning and to provide a construct researchers can use to measure acquisition through instructional tasks. The three dimensions of involvement load are *need* (the motivational component, concerned with finding the right item for a vocabulary-related task), *search* (i.e. finding information about meaning, form or usage, e.g. by consulting a dictionary), and *evaluation* (i.e. when the learner decides whether or not an item fits into a particular context). Purushotma asserts that "an entertainment-focused video game such as *The Sims* can be modified to not only fulfill each of these criteria, but to do so in a manner that minimizes extraneous effort and stress on part of the learner, provides repeated interactive exposures to words, and automatically generates rich contexts for associations"(2005, p. 84).

RESEARCH QUESTIONS

On the basis of the issues raised in the foregoing discussion, the following research questions were formulated.

1. Does structured play of the computer simulation game *The Sims* facilitated by the use of supplementary materials lead to vocabulary acquisition?
2. How do the participants respond to the supplementary materials and modified mode of play?
3. Do participants enjoy playing the game and perceive it as useful for language learning?

Methods and materials

PARTICIPANTS

This study involved a convenience sample of nine[1] intermediate-level ESL learners enrolled at a major Midwestern research university. The participants' L1 backgrounds included Mandarin Chinese, Korean, Arabic, Japanese, Spanish, and Vietnamese. Most were undergraduates who had been placed in ESL reading classes on the basis of placement test scores. These scores, as well as the instructor's subjective assessments, were used to divide the participants into three proficiency groups (high, medium and low). They were then further divided into dyads, in which both members shared a proficiency level but had different L1s to compel them to interact in English.

***The Sims*.** *The Sims* is a best-selling computer simulation game that allows players to create a virtual family of characters called *Sims*, whom they then guide through the challenges of everyday living (Croal, 2003). Players must attend to their Sims' physical and emotional needs, help them find jobs and resolve domestic and interpersonal problems, and decorate their homes with furniture and appliances. Although the characters do not speak (they interact instead via gesture and a nonsense language called *Simlish)* the game exposes players to a great deal of written language in the instructions, control and status bar labels, warnings and information updates, and product descriptions in the extensive virtual catalogs used for shopping in the game.

Website. The supplementary materials used in the site were composed in HTML and compiled into a website that served both as a companion to the game and also the means of administering the experimental conditions, which took the form of different stations. Station 1 included vocabulary information and quizzes, culture notes, and instructions for each day's play; Station 2 included a link to an online dictionary and the same culture notes and instructions as in Station 1, but no vocabulary-related materials; and Station 3 contained only the gaming instructions. The companion site was accessed via a resource computer located next to each gaming computer (see Figure 1).

Vocabulary list. Thirty words were selected for the experiment from a list of five thousand occurring within *The Sims*. The list was run through an online vocabulary profiler (Cobb, 2003), which sorted them with reference to frequency lists. Low frequency items deemed likely to be unfamiliar to participants were extracted and from these, three sets of 10 were chosen for the study (see Appendix) on the basis of their appearance more than once in the game and the likelihood of participants coming across them (Miller & Hegelheimer, 2006). The words were laid out in charts alongside definitions, synonyms, antonyms, and the contexts in which they occur, and these charts were incorporated into the online materials for Station 1.

Vocabulary exercises. To provide additional exposures to the target words and allow participants to check their learning, a series of web-based vocabulary exercises were designed to accompany each vocabulary chart. These consisted of simple matching exercises created with *Hot Potatoes 6.0* (Arneil & Holmes, 1997).

Online dictionary. Participants working in Station 2 and 3 had access to the Longman Dictionary of Contemporary English Online.

Cultural notes. Explanations were compiled to explain some of the cultural references participants would encounter in the game, which is set in a suburban American neighborhood. For example, in Session 3, where participants are expected to find jobs for their characters, the notes describe different *career tracks* as well as the term *car pooling*.

Pre-tests, post-tests, and weekly quizzes. A pre-test was used to evaluate existing knowledge of the target words, help group students into roughly similar levels of proficiency,

and provide a baseline for comparison with the post-test. Both the pre- and post-tests measured knowledge of the same set of 30 words but in different randomized orders and via a variety of question types (matching, multiple choice, and short answer). Paper-based quizzes were also administered immediately after the second, third and fourth gaming sessions to measure vocabulary acquisition. The items tested were identical to those from the pre- and post-tests but limited to sets of 10 words likely to have been encountered in each particular gaming session.

Pre- and post-project surveys. A pre-project survey elicited the participants' gender, age, L1, length of time in the U.S. and other biodata, as well as familiarity with and attitudes toward computers. A longer, more detailed post-project survey employing both Likert-scale items and open-ended questions asked participants to evaluate their experience over the four weeks of the study, addressing the following topics:

- enjoyment from playing the game;
- experience of playing with a partner;
- perceived usefulness and actual use of the supplementary materials;
- perceptions of the value of *The Sims* as a language-learning tool;
- self-assessment of language-learning gains from the game.

Design. The within-subjects design featured counterbalancing achieved by rotating the dyads randomly through each station to expose them to all three experimental conditions and avoid an ordering effect. In addition, participants in each dyad took turns being either the *controller* or *manager*; the manager was in charge of the resource computer and was tasked with relaying instructions and guidance to the controller, who operated the gaming computer (Figure 1).

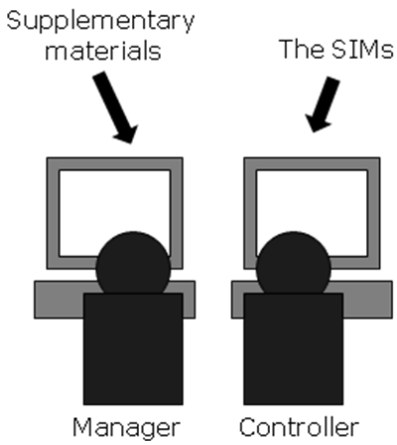

Figure 1: Roles and positions in the dyads

Analysis. The quantitative data was compiled in a spreadsheet and then transferred to SPSS to calculate descriptive statistics, paired-sample T-test values for the pre- and post-test data, and ANOVA and post-hoc values for the weekly quiz scores. The qualitative data from the open-ended survey questions was thematically coded by identifying utterances that revealed attitudinal or motivational characteristics.

Results and discussion

RESEARCH QUESTION 1

To assess vocabulary acquisition, descriptive statistics were calculated for the pre- and post-test scores, and then a paired-samples t-test was conducted to compare means. The results are presented in Table 3. These figures indicated an increase of 4.22 (14 %) in the average score from pre- to post-test. The t-test showed this difference to be significant at the 0.05 level.

Table 3: Pre- and Post-test means, standard deviations and t-value

	Mean	**Standard Deviation**	***p*-value**
Pre-test	14.22	2.22	
Post-test	18.44	4.24	0.0022*

Note: *n*=9, *k*=30 questions, *p**=.05*

Next, the scores for the weekly quizzes were aggregated according to the three experimental conditions (Station 1, 2 and 3) and analyzed for descriptive statistics. These are presented in Table 4, along with the overall mean and standard deviation for total quiz scores. The average scores from the set of quizzes for each station were then used to calculate a one-way ANOVA, the results of which are shown in Table 5.

Table 4: Combined average quiz scores by station

Station 1		**Station 2**		**Station 3**		**Overall**	
M	SD	M	SD	M	SD	M	SD
8.56	1.33	5.78	2.22	6.89	1.96	7.03	2.08

Note: n=9; k=10 questions; Station 1 = required online vocabulary notes and exercise; Station 2 = optional culture notes and online dictionary, Station 3 = no materials

Table 5: ANOVA for combined quiz scores by session

Stations Tested	Mean difference	*p*-value
1 vs. 2	2.78	.01
1 vs. 3	1.67	.16
2 vs. 3	-1.11	.43

p*=.05

As expected, Station 1 (all supplementary materials) yielded the highest mean score at 8.56, compared to 5.78 for Station 2 (optional culture notes plus online dictionary) and 6.89 for Station 3 (instructions only). Station 1 also featured the lowest standard deviation at 1.33, compared to 2.22 for Station 2, 1.96 for Station 3 and 2.08 for the quizzes as a whole. The higher mean score of Station 3 over Station 2 is also noteworthy.

One-way ANOVA revealed the mean difference between Stations 1 and 2 to be statistically significant (MD = 2.78, p = 0.01), but this was not the case for Stations 1 and 3 (MD = 1.67, p = 0.16) or Stations 2 and 3 (MD = -1.11, p = 0.43). These findings resemble those in Miller and Hegelheimer (2006), where we find the same ranking of mean scores by station (1, 3 and 2) as well as the same presence or absence of statistical significance.

In answer to the Research Question 1, therefore, the results suggest that combining these supplementary materials with structured play of *The Sims* does indeed contribute to vocabulary acquisition. The statistical evidence suggests a link between the combined effects of materials-plus-game and the higher quiz scores reported for Station 1.
An issue raised by this analysis, however, is the relative contributions of the supplementary materials versus the game itself to these learning gains. Qualitative data from the post-project survey indicated some participants felt the game did not provide sufficient examples of the target vocabulary in context; others believed they did not have enough time during the study to pay attention to unfamiliar vocabulary (see discussion of Research Question 2 below). This clearly has implications for the design of pedagogical applications, as will be discussed later.

RESEARCH QUESTION 2

Participants' survey responses concerning the adaptations used in the study are reported in Table 6. These correspond to Questions 4-8 and 14-17 in the survey, which are also reproduced below.

Table 6: Responses to post-project survey questions about adaptations for ESL

ID	Q4	Q5	Q6	Q7	Q8	Q14	Q15	Q16	Q17
1	4	4	5	4	3	5	5	5	5
3	4	4	3	3	3	4	4	4	4
4	4	4	3	2	3	4	5	4	3
6	3	3	2	2	3	4	4	4	3
7	4	4	4	1	3	5	5	5	4
10	4	4	3	4	2	2	2	2	3
13	4	4	3	3	3	3	5	5	4
15	4	3	4	2	3	4	4	4	4
16	3	3	4	5	4	5	4	3	4
M	3.9	3.7	3.4	2.6	2.9	3.9	4.2	4.1	3.7
SD	0.4	0.5	0.9	1.3	0.5	1	1	1	0.7

Note: 1=Strongly disagree, 2=Disagree, 3=Somewhat agree, 4=Agree, 5=Strongly Agree; See Post-project Survey in Appendix H

Q4. The resource materials (daily instructions, vocabulary notes, culture notes, etc.) were helpful.

Q5. My partner and I used the resource materials a lot.

Q6. I could have easily played *The Sims* without using any of the resource materials.

Q7. I saw many of the words from the resource materials and weekly quizzes while playing *The Sims*.

Q14. I enjoyed working with a partner while playing *The Sims*.

Q15. It was helpful to play *The Sims* with another person.

Q16. My partner and I helped each other understand the unfamiliar words and phrases used in *The Sims*.

Q17. My partner and I spoke a lot of English to each other while playing.

The responses indicate a generally favorable attitude toward the supplementary materials as important in playing the game. On a scale of 1 to 5, with 1 denoting "strongly disagree" and 5 denoting "strongly agree," participants generally agreed that the notes were clear (mean 3.9, SD 0.4) and helpful (mean 3.7, SD 0.5). They also agreed moderately that they had "used the resource materials a lot" (mean 3.4, SD 0.9). Furthermore, they disagreed, albeit slightly, with the notion that they could have played the game without the supplementary materials (mean 2.6, SD 1.3).

As for playing the game with a partner, it was generally deemed enjoyable (mean 3.9, SD 1) and helpful (mean 4.2, SD 1). Participants agreed that they and their partners had helped each other understand unfamiliar words and phrases (mean, 4.1, SD 1), and concurred somewhat less strongly that they spoke a lot of English to each other while playing (mean 3.7, SD 1).

These statistical findings are supported by written comments from the survey. In response to Question 22, a number of students indicated they found the supplementary materials the most useful part of the project.

> To learn about American culture and vocabulary in usual lives (06, Q22)[2].
>
> The vocabulary quizzes (07, Q22)
>
> Vocabulary list. We really need more time to remember before we play otherwise, we do not know what is going on. (10, Q22)

However, such views were tempered by responses to both Question 23, which asked participants which aspect of the project they found *least* useful, and Question 27, which asked how they thought simulation games could be improved for language learning.

> Maybe more game instructions [are needed]. (07, Q23)
>
> If this simulation game give detail direction and background of the game it will more useful. Because I didn't use the culture resource or vocabulary properly and I sometimes didn't see new vocabulary in the game (06, Q27).

The written comments also revealed mixed feelings about working with a partner. Several indicated that they liked this feature in their responses to Question 24, "What did you enjoy the most [about the project]?"

> Talk with partner and find out how to play it. (03, Q24)
>
> To talk with partner about Sims. (06, Q24)

On the other hand, at least one listed "play with a partner" (10, Q25) in response to the question about what they enjoyed the least.

In summary, it appears that most of the participants in the study seemed favorably disposed toward the adaptations used to render *The Sims* accessible to ESL learners and useful for language learning, insofar as they found the supplementary materials clear and helpful and considered it enjoyable and beneficial to play the game with a partner.

RESEARCH QUESTION 3

Responses to Questions 1-2, 10, 13, and 18-21, which dealt with the enjoyment derived from playing the game and participants' perceptions of its usefulness for language learning, are summarized in Table 7.

Table 7: Game's appeal and usefulness for language learning

ID	Q1	Q2	Q10	Q13	Q18	Q19	Q20	Q21
1	5	5	3	2	4	5	4	3
3	4	4	4	2	4	4	4	4
4	4	2	4	3	3	3	2	3
6	4	2	4	2	4	4	3	3
7	4	3	4	2	4	4	3	3
10	4	4	3	3	4	3	3	3
13	4	4	4	2	4	5	5	4
15	3	3	3	2	3	3	3	2
16	4	3	4	2	3	3	3	2
M	4	3.4	3.6	2.2	3.7	3.9	3.4	3.1
SD	0.5	1	0.5	0.4	0.5	0.8	0.9	0.7

Note: 1=Strongly disagree, 2=Disagree, 3=Somewhat agree, 4=Agree, 5=Strongly Agree; See Post-project Survey in Appendix H

Q1. I enjoyed playing *The Sims*.

Q2. I found the game easy to play.

Q10. I learned new words and expressions playing *The Sims*.

Q13. Playing *The Sims* did NOT help me improve my English.

Q18. Simulation games like *The Sims* can be useful for improving language ability.

Q19. I would enjoy playing *The Sims* again in the future if I had the chance.

Q20. I would use *The Sims* as a language learning tool if I had the chance.

Q21. Simulation games are more useful for language learning than taking an English course.

With respect to the game's appeal, there was solid agreement that playing *The Sims* was enjoyable (mean 4, SD 0.5) and that participants would play again if given the chance (mean 3.9, SD 0.8). There was less agreement, however, with the notion that it was easy to play (mean 3.4, SD 1).

There was also a range of attitudes toward the game's potential as a language-learning tool. Participants agreed moderately that they learned new words and expressions (mean 3.6, SD 0.5), and that simulation games in general can be helpful for language learning (mean 3.7, SD 0.5). In addition, they also clearly disagreed that playing *The Sims* had not helped them

to improve their English (mean 2.2, SD 0.4). However, they expressed less agreement with the notion of using *The Sims* again for language learning (mean 3.4, SD 0.9), and still less that simulation games are more useful for language learning than taking an English course (mean 3.1, SD 0.7).

These interpretations are again borne out by the written comments. Asked what they enjoyed most about the project, several mentioned the game in general, or particular aspects of it.

> I enjoyed making family in the computer. (01, Q24)
>
> The create family and buy furniture. (04, Q24)
>
> I enjoyed learning American life pattern. (16, Q24)

By contrast, other responses indicated that at least some participants had experienced difficulty playing or were unhappy with some of its features.

> We didn't know how to play the game well. (07, Q25).
>
> It was too hard to get a job. (16, Q25)
>
> It was sometime boring, because I did same action again and again. (01, Q25)

Many responses regarding what was most useful (Q22) and whether participants thought their English had improved, were positive, and mentioned vocabulary in particular.

> I could learn many strange word which I didn't see [before]. (01, Q22)
>
> I can talk with my partner to practice my English skill, and learn some new words from the game. (03, Q22)
>
> There are a lot of useful words and it makes me to understand about the situation the words are used. (16, Q22)
>
> It is fun so that it stimulates people play – learning English. (13, Q22)
>
> … *The Sims* show us what the words mean by character's behavior. (16, Q26)

These comments contrasted with views about the project's least useful (Q23) and least enjoyable (Q25) aspects, and participants' ideas about what could be done to make simulation games more useful for language learning (Q27). In particular, there was dissatisfaction about the lack of exposure to spoken English in the game.

> When people [*The Sims* characters] chat, they should say something, not just the picture. (03, Q23)
>
> There was no listening. (15, Q23)
>
> May[be] a game with listening incorporated will be better. (07, Q27)

> No English conversation. (13, Q25)

Others noted that the prevailing need to maintain their characters' happiness kept them from paying attention to other things, including unfamiliar vocabulary.

> Sometime it can help the students improve their English. But most of time, the people just focus on the game. They don't care if they know the meaning of the game. Even don't know this word, we can play the game well either [way]. But if we … cannot play when we don't know the meaning of the most word, maybe the students would care them and study the new words. (10, Q27)

> Because I and my partner tired to control and keep Sims make happy. I couldn't concentrate on other subject such as vocabulary or culture resources. (06, Q23)

It would appear, then, that the participants generally enjoyed playing *The Sims* despite the difficulties they encountered. On the basis of their experience, they felt simulation games in general have the potential to contribute to language learning but do not consider them substitutes for traditional course-based instruction. Furthermore, they appear to have particular reservations about the value of *The Sims* as a tool for language instruction, at least as it was employed in this study.

Conclusions

Two limitations must be noted. First, because of the small sample size, it is difficult to generalize the findings to other U.S.-based university ESL student populations. However, the fact that the results generally support the conclusions drawn in the Miller and Hegelheimer (2006) suggests at least that there are tendencies worthy of note. Secondly, the use of self-reporting data will always involve some risks, relying as it does on the assumption that respondents will be candid and truthful; the survey data used in this study should be considered in this light.

Nevertheless, this study has provided further evidence that commercially produced computer simulation games can, with theoretical guidance, be adapted for use by ESL students; and further that supplementary ESL materials used to support such play can contribute to vocabulary acquisition. The findings also suggest that computer simulation games like *The Sims* are potentially popular with ESL students from a wide variety of backgrounds, and that students may be open to the prospect of having such games incorporated into a program of language learning under certain conditions. This would seem

a promising area for further exploration given the potential appeal of such games, assuming some of the issues raised in this study can be addressed.

IMPLICATIONS FOR TEACHING

The unpredictable nature of the vocabulary exposure will be a key issue in developing any instructional application. Despite the control entailed in the modifications, learners nevertheless have a great deal of freedom upon entering the gaming environment; they may have tasks to perform, but given the complexity of the simulation, there may be myriad ways to accomplish these. Teachers and developers will be hard-pressed to anticipate every potential avenue to these goals and the attendant language that learners will be exposed to in the process, unless they are prepared to give very detailed, narrow instructions that could affect the game's appeal. It is probably impractical, therefore, to use simulation games to teach specific vocabulary. A more practical approach might be to use modified play of simulation games as a supplementary source of linguistic exposure to complement regular coursework, similar to extensive reading (but likely much more popular among students).

Another possibility is for instructors – perhaps with the help of technically gifted students in the event their own skills are lacking – to actually adapt the simulations themselves. Purushotma (2005) asserts that this is accomplished relatively easily with certain games, including *The Sims,* through manipulation of the source code. With many developers and game design companies adopting open-source models to encourage users to develop and share custom-designed add-ons, this option is becoming increasingly feasible.

It should also be remembered that this research has focused on an offline, stand-alone simulation game in which the user is essentially interacting with a computer. However, simulations have recently taken on an additional form as Internet-based virtual worlds such as *Second Life* and *There*, in which large numbers of players from all over the world gather and interact through avatars. These so-called *synthetic immersive environments*, many of which now support voice-chat, might be able to address the concerns of this study's participants in about the lack of conversational opportunities. Without a doubt, they add an another dimension to the discussion about how to harness the power and appeal of computer simulations in the service of language learning.

Notes

[1] While 16 students were recruited, absences and misadministration of some of the assessment measures required that data for 7 of the participants be omitted.

[2] Quotations from the post-project survey results are followed by the participant's ID number (e.g. 07) and the question number from the survey (e.g. Q23).

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Appendix: Words selected for the study

Session 2	Session 3	Session 4
bulldoze	*car pool*	*classic*
customize	*career*	*decorative*
garment	*charisma*	*deluxe*
interact	*compatible*	*depressed*
logo	*creativity*	*durable*
mode	*energy*	*elegant*
pan	*flirt*	*exquisite*
panel	*hygiene*	*fidelity*
wardrobe	*logic*	*incredible*
zoom	*tickle*	*unique*