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10 Key Principles for Designing Video Games for Foreign Language Learning

Ravi Purushotma, Steven L. Thorne, and Julian Wheatley

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Abstract

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In opening his book describing the ways in which school environments need to adapt to the digital age, Seymour Pappert (1993) imagined two groups of time travelers arriving in the present from a previous century: a group of surgeons and a group of teachers. The surgeons enter a present-day operating room and are overwhelmed, trying to make sense of the strange devices and complex operations that, in earlier times, they could not have even imagined; but the teachers are able to walk into reasonably familiar surroundings and deliver their lessons almost as if they had never traveled through time at all.

Now, what if the time travelers had been foreign language teachers? A century ago – or even much more recently – the model language classroom would probably have featured a teacher at a podium presenting rules of grammar, asking students to ‘parse’ and then translate sentences out of the target language, and perhaps also asking them to translate English sentences written on the blackboard into the target language. Today, a model language classroom looks quite different. In the first place, the teacher is more likely to be off to the side of the class, or moving around, while the students are likely to be organized in groups or pairs. But the most striking difference is that the students seem to be at least as active as the teacher – if not more so; indeed, in progressive classrooms, they are communicating in the target language, asking questions, offering opinions, disagreeing. The teacher may intervene from time to time; and at times, the whole class may focus on a language issue – a point of grammar or lexical usage, a pronunciation problem or a particular cultural practice. But otherwise, the class is engaged in *using* the language, not merely talking *about* language. The learning is embedded in communication.





































Foreign language learning has never fitted nicely into established models of education the way that other disciplines have. In other fields, such as engineering or history, teachers develop their understanding of the subject through a systematic course of study, which then forms the basis for their own teaching. Many language teachers, on the other hand, have not learned the language through formal study. They may be native speakers, who have come to know their language as young children through the mysterious processes of language acquisition, which even if better understood, would probably not be applicable to more mature, second language learners. But even the non-native speakers, whose training almost always includes a period of formal language instruction, hesitate to simply continue the methods of their own training when confronted with students whose cultural interests may be vastly different from their own. Foreign language learning, after all, is quite unlike other kinds of academic learning; it is directed towards what is, in fact, a crucial tool for learning, language itself, with implications for personality and even

thought. Learning a second language is rather like renovating your house without moving out: you can shift things around and add to the structure, but you still need to be able to live in it. Given the unique nature of the task, it is not surprising to find a diversity of views on language pedagogy and a constant search for more effective and efficient approaches by new generations of language teachers. Despite a range of language teaching practices, there has emerged over the past half century a degree of consensus among language teachers and others involved in the language learning enterprise; specifically, language learning should focus on doing real things with the language, not necessarily to the exclusion of more traditional activities that focus on linguistic elements, but so that ultimately, the learner is involved in the goal of his or her study: communication. Communicative language teaching, and communicative materials, are designed to achieve this end. Ellis (2003) writes:

It is clear to me that if learners are to develop the competence they need to use a second language easily and effectively in the kinds of situations they meet outside the classroom they need to experience how language is used as a tool for communication inside it. 'Task' serves as the most obvious means for organizing teaching along these lines... The study of 'tasks' serves to bring SLA [Second Language Acquisition] and language pedagogy together. It is a construct they have in common and thus is the ideal means for establishing bridges between the two fields.

Introducing 'tasks' or problems that require language use to achieve success is a particularly powerful way to ensure real communication in the classroom. Solving problems and doing tasks focus attention and provide an effective organizing principle. The task is the goal, and once the goal is clearly articulated, the linguistic needs become clear; the teacher can organize the curriculum so that these needs – lexical, grammatical, social and cultural – can be met. Tasks may be designed with language learning in mind; or they may simulate the encounters that take place outside the classroom, in the 'real world'. The following example, taken from Ellis (2003), belongs to the former type. Students are paired off and given separate sheets of paper, containing similar or identical items.

The same or Different?

A		✂	B	
1		X	1	
2	X		2	
3		X	3	
4	X		4	
5		X	5	
6	X		6	
7		X	7	
8	X		8	
9		X	9	
10	X		10	
11		X	11	
12	X		12	
13		X	13	
14	X		14	
15		X	15	
16	X		16	
17		X	17	
18	X		18	

The students' task is to find out, without looking at the partner's list, which items on the two lists are identical and which are only similar. They can only do this by questioning or commenting in the target language. Thus, the overt purpose of the lesson is not "to study the use of copular verb constructions," but rather "to compare and identify discrepancies between the objects that you see and those that your partner sees." To do so, of course, students will in fact have to make use of copular verb constructions, but they will craft the interrogation in their own terms. If they have not fully internalized the linguistic material that they need, they can look to their partner for help, or failing that, seek help from their teacher. Thus, the traditional grammatical and lexical underpinnings are still taught, but they are embedded within a task where their relevance is apparent and where they can be associated with actual situations.

While there seems to be a fair degree of consensus among language theorists and teachers about the benefits of incorporating Task-Based Language Teaching (TBLT) in the curriculum, actually applying it to the classroom setting is still in early stages of development. But even now, it is possible to conceive of a number of ways to enhance student engagement in task-based activities. These include: (1) finding ways to introduce more complex *narrative* structure to the task; (2) adding elements of *play*; and (3) increasing

the complexity of *social interaction* required (Purushotma 2006).

Narrative

We will illustrate the use of narrative complexity with a commonly used task from the annals of Chinese language teaching called *Family Reunion*. This task based activity can be scheduled, in conjunction with related textbook material if possible, for part of class periods over a number of days or even weeks. Students are provided with fictional identities (which could, in fact, be derived from an earlier activity). Their tasks involve interviewing each other and creating a family tree; deciding on the appropriate venue for a family reunion; selecting a menu; deciding on the seating arrangements; and planning activities, such as toasts or short speeches, that could take place during the drawn out meal. The tasks serve as a vehicle for engaging in the linguistic performance of family roles and relationships, developing sensitivity to status, learning about how the Chinese order meals, and learning about Chinese etiquette. It involves conversation and reading, and can easily incorporate writing assignments as well.

Now, one way to enrich this activity, and make it more engaging, is to introduce elements of plot and narrative. For example, the family could have been scattered by civil war, or natural disaster. The patriarch, now 80, brings them together. Students adopt the roles of lost family members, each with a story to tell. In order to recount their ordeals, they study maps, read history (in English), interview Chinese friends and teachers (in Chinese) so as to put together a reasonable account of their travels (a manageable topic), propose toasts, and (perhaps) write essays. Activities of this kind, which give students a chance to become characters in a plot, generally inspire a great deal of communicative activity (whether conversational or textual). In fact, students often get quite carried away researching their characters, providing histories and searching for multi-media material that can enliven their stories. The task of the teacher is equally demanding, of course: he or she needs to provide culturally appropriate linguistic material, opportunities for practice, as well as monitoring and guiding the activity as it unfolds.

Play

Language teachers know the value of play and are good at finding ways of transforming what were once mundane tasks into engaging experiences by making games out of them. The following example is an elaboration of a 'game' (or activity) used occasionally in Chinese language classes, involving adventure, maps, and role playing. This particular example was suggested by a fellow Chinese language teacher, Carl Robertson (personal communication), who envisioned taking the simple computer game called 'Amazon Trail', and converting it back to a non-digital classroom setting, thereby providing a nice illustration of the potential relationship between classroom activities and game environments. Whatever the geographical setting chosen, the game involves a trail passing through villages, obstacles on the trail — waterfalls, rapids, malarial villages, and ways of overcoming them. The details need to be plotted out in a pre-game activity involving teacher and students discoursing in the target language. The trail can take the form of a map drawn on a board. The game begins with students breaking up into two teams: explorers who have the map that shows them which villages they have to pass through on their route; and villagers, who know something about — but not necessarily everything about — local dangers. The explorers first have to locate a particular sequence of villages, then they have to gather information from the villagers, discuss optimal solutions, and so on. The key is the process of negotiation that must take place for the explorers to find out where they are, what the nature

of the danger is, and how they might deal with it. It is, in other words, a sequence of tasks driven by an adventure theme, with information gaps. Such games are highly engaging, and if they are carefully set up, they can provoke a wealth of language use, either conversation or a mix of conversation and literary skills.

Social Interconnectedness

The case we describe here comes out of research (data and analysis drawn from [Thorne, 2003](#)) involving a university level French grammar student participating in an intercultural exchange with university students in France. A student in the American class described a transition that began with frustration over the slow start to her intercultural foreign language education partnership, but which evolved into prolific flurries of communication when the interaction shifted from email messages to instant messaging (IM). The student reported that an initial IM interaction, initiated by her designated 'keypal' partner in France, continued with only brief interruptions for nearly 6 hours, and included the use of both English and French. Subsequent to this first IM conversation, discussion partners continued to communicate in 20 to 30-minute sessions, often twice or three times a day.

Two issues related to this case are highly salient. The first is the voluntary shift from email to IM, the latter of which is the clear communication tool of choice for peer interaction among university-aged youth in the United States (e.g., Shiu & Lenhart, 2004). The second issue is the subordination of French language study as an educational activity to the use of French (and English) for the building of a personally meaningful relationship. Not discounting the importance of the flirtatious nature of this relationship, the American student reported that her linguistic and pragmatic performance in French had improved, and perhaps most significantly, she found herself using French to engage in meaningful communication for the first time. As evidence of this, the student provided an extended description of her outside-of-class e-mail and IM transcripts and was able to point to specific instances that demonstrated what she perceived as an expanded competence to communicate in French. The student herself realized a new found communicative capacity when she stated, "that was the first time that I was like, 'I made a connection in French.' I was so proud. It was like, 'wow, that's me, in French, and he understood me!'" ([Thorne, 2003](#): 53). This brief case study suggests that digitally mediated environments can enable hyperpersonal levels of engagement, which in turn can be associated with a range of potential developmental trajectories.

While tasks rich in narrative, play and social engagement have demonstrated a strong potential to enhance language instruction, incorporating them in the curriculum requires considerable creative talent and production time. Thus, while we have seen consistent and strong learning gains when language teachers in affluent college classrooms deploy rich Task-Based Language activities, numerous challenges have severely restricted their expansion to other classrooms worldwide facing tougher logistical constraints.

The primary challenge that tasks, such as those described above, face is one of scalability. Simply photocopying a traditional handout in which students fill-in-the-blank for a series of questions about what they would take on a journey across along Amazon river can be scaled for more students simply by hitting "70" on the xerox machine instead of "15." However, constructing a game environment in which a student's previous choices influence future options, making it necessary to update maps and keep track of various scenarios, would be overwhelming for a teacher who might have to teach several classes per day, each with more than 50 students.

Besides preparing and orchestrating class materials, narrative-dependent tasks require teachers to take on a role similar to that of a director of a play. A generic family reunion lesson plan could be read and implemented by a teacher in a matter of minutes; but activities with complex narratives may require teachers to internalize and keep track a vast amount of detail, and then to make sure the activity runs smoothly over a period of days or more.

Given its capability to instantly connect students learning a language with those who speak natively, regardless of where they are on the globe, one would expect the internet to play a central role in foreign language learning and teaching. Yet, in comparison to activities such as social networking and online video games, language learning has been slow to adopt hyper-social technologies. A possible reason for this is that the language learning enterprise simply has not attracted the amount of investment needed to impress an audience used to ever more sophisticated popular media technology. Rather than trying to compete with the technologies employed in popular media, educators can learn from them how to build scalable systems in a practical manner. In particular, video games are extremely well suited to the communicative goals of the foreign language classroom; they scale well and are built upon tested frameworks and techniques that could greatly benefit educational designers. In trying to define Task-Based Language Teaching, Richards and Rodgers (2001) outline a few archetypal language learning tasks:

Task-Based Language Teaching proposes the notion of “task” as a central unit of planning and teaching. Although definitions of task vary in TBLT, there is a commonsensical understanding that a task is an activity or goal that is carried out using language, such as finding a solution to a puzzle , reading a map and giving directions , making a telephone call , writing a letter , or reading a set of instructions and assembling a toy.

The overwhelming majority of video games today already include at least one of these tasks, along with numerous others already well suited to language learning. In the case of a class “playing” a real life version of *Amazon Trail*—itself a spin-off of the video game *Oregon Trail* – the activity was originally a video game that was recognized to be such a natural fit for language learning that the teacher saw fit to recreate in real-life all the elements that he was unable to reprogram. Other teachers have observed how video games completely transform a student’s understanding and level of engagement with a narrative: Mylene Catel (2008), a college French teacher, reports how incorporating characters from her French literature class into the game *Sims 2*, students go beyond the existing literary world and begin to author their own creative expansions of the narrative. German teacher Todd Bryant (2007) gets his students conversing with other German players inside the online game *World of Warcraft*. Rather than brief dialogs fabricated specifically for the purpose of language exchange, his students engage in meaningful dialogs with non-classroom peers in order to accomplish the tasks that arise from playing the game.

While it is clear that video games have an extraordinary potential for making profound and scalable improvements to the language learning curriculum, it is important that we not overlook the challenges involved. Far from being the simple tests of dexterity that they once were, video games are possibly now the most complex popular media form in existence. Designers draw upon research from dozens of disciplines in order to craft extremely intricate game

RELEVANT RESEARCH

It is critical to underscore that gaming environments should not simply reproduce conventional foreign language pedagogy in a digital gaming format. Rather, we are proposing a framework that emphasizes goal-directed activities within constructed gaming

systems.

If understanding either video games design or human language acquisition were not difficult enough, blending the two together becomes exponentially harder. The natural tendency will always be to simply take the best practices from the classroom, replicate them on the screen, and package them as video games. However, this approach typically results in a game that combines the pedagogical value of a bad video game with the entertainment value of a bad textbook (Jenkins 2006). Alternatively, one might start with a fun video game and simply present it in the foreign language; but that would be no more effective than playing a currently existing foreign video game. A better course of action is to begin by thinking about what elements of the language learning process are already present within modern video game genres, and use them as the basis for further development. It will often be the case that video games will be effective in just those areas where classroom practice is weak; and vice versa. This paper by no means attempts to present an exhaustive review of all the relevant literature from both video games research and second language acquisition. Rather, we offer ten key design principles drawn from points where the two disciplines naturally overlap. We hope these prove useful both to those looking to experiment with the production of actual language learning video games and to theorists looking for a starting point in building a more complete picture of how these two fields might complement one another.

Key Principles

#1 At least as much thought needs to go into the design of failure states as for success states

When we make games now, we very much think in terms of what are the interaction loops, and what are the success and failure sides of those interaction loops. One of the things that's kind of non-intuitive here is that it's actually more important to really think through the failure side than the success side. Because, when you think about it, the success side is pretty boring: you want to get to the next level. You could just spend most of your time failing, and it's important that the failures are interesting, varied and primarily that you understand why the failure occurred.

environments. Language, then, becomes a resource that players can and will need to utilize to carry out various social actions (such as role distribution within, and coordination of groups of players) that lead toward successfully completing puzzles, problems, tasks, creation of more complex representational media or objects, and the like. Key factors and research traditions include the following:

The need to focus on language as a resource for engaging in goal-directed activity rather than a focus on the explicit rules of language for their own sake. See, for example, the SLA literature that couples together ethnomethodology and conversation analysis with second language acquisition (e.g., Mondada & Pekarek, 2004; Mori, 2002).

Functional linguistic approaches to grammar and talk-in-interaction suggest meaning-based frameworks for making language relevant to game play and goal directed tasks and activities (Thorne & Lantolf, 2007; Tomasello, 2003). While we are concerned with formal accuracy and eventual mastery of power-genres, we are also invested in building a gaming spaces that leverages the "utterance" (e.g., Bakhtin, 1986) as the unit of analysis (rather than the sentence), especially in interactive and dialogic contexts.

-Will Wright (2003), designer of *The Sims*, the best selling computer game ever.

While the above insight would be useful for designing any video game, it becomes especially critical for designing games for language learning. Research on second language acquisition shows that (1) learner anxiety can be a major impediment to successful acquisition (Horwitz & Cope 1986; MacIntyre & Gardner 1991; Madsen, et al. 1991; Ganschow, et al. 1994]) and that (2) useful feedback about learner mistakes is both necessary, yet extremely difficult to provide properly (Lyster 1997). In a traditional e-learning model, students are presented with an assignment in which the goal is to respond with an answer that matches the correct answer stored in the computer. As they make mistakes, the system informs them of the changes they need to make, guiding them towards the correct answer. At this point the system may play an elaborate “congratulations” sequence to reward them for succeeding. By contrast, Will Wright attributes the success of *The Sims* to the efforts his design team put into thinking through all the creative ways the game responds to *mistakes* a player might make, such as how the characters react when the player forgets to feed them or to provide an exit ladder from their swimming pool. Thus, players may not even decide on an actual goal in the game, but simply enjoy exploring all the different ways they can fail. In the process, they learn about how systems such as nutrition and architecture work within the game, and ultimately arrive at their own understanding of the goal. By providing an environment in which a player making a mistake can simply say “yeah, I knew it was the wrong choice, but I was curious what would happen if I did something crazy,” video games offer an opportunity to lower some of the frustration and anxiety students often feel while learning a second language. In this sense, learners are encouraged to utilize language in partial and fragmentary ways during earlier stages of acquisition and should be positively rewarded for doing so. Furthermore, good game design offers us the ability to form powerful learning experiences out of mistakes. For example, imagine we are designing a kid’s game in which the task is to order a hamburger from a fast-food store. If our goal is simply to guide players towards the correct answer, we can give them a menu so they can indicate that “I would like [a hamburger / some spaghetti / udon noodles] please”, with the system responding “sorry, we don’t serve that here” for either of the latter two responses. Alternatively, they could be given the choice “I would like [a hamburger / some spaghetti / a car tire] please.” The spaghetti choice might simply display a map with written directions about how to get to an Italian restaurant, or it might show a thought bubble emanating from the cashier showing confused kitchen staff all tangled up in spaghetti and a red X through it, as he goes on to inform the player that they don’t have any. The car tire response could be instructions on how to get to the auto store — like the spaghetti response above; or it could trigger an animation sequence in which the player’s character actually tries to eat a car tire, then rolls around the fast food store.

The more creative responses give players highly memorable cues to understand the real meanings of the choices they make. Naturally, feedback mechanisms should be designed to fit with the sensibilities of the age-range of the target audience, but there should always be some mechanism in place that ensures that players understand that the reason the designers have put so much creative thought into the system’s failure responses is because they fully expect the players to make mistakes — and that’s all right.

Relevant Research

As emphasized in this Key Principle #1, we should engineer the game to cater primarily to failure and partial success, because language learners absolutely must fail, repeatedly, in the process of gaining control over complex morphology, syntax, and supra-sentential as well as realtime features of foreign language use. One approach to feedback that productively works with failure states or partial success is called “dynamic assessment.” This

Any learning game could benefit from including creative feedback mechanisms. For language learning, however, creative feedback is not simply beneficial, it is necessary. Mangubhai (2006) describes how difficult it can be even for a teacher to provide corrective feedback:

One form of error correction that is frequently used by teachers is, what is called, 'recast'. A student says, 'Jill go to town' and the teacher says, 'Yes, Jill went to town' in the hope that the student will have noticed the mismatch in the use of the verb by her and by the teacher. But students, it seems, do not always notice the difference. Lyster (1998) has shown that in the immersion language classrooms he studied — that is, content-based classrooms — it is difficult for students to distinguish between feedback which confirms the content of what has been said, from the feedback meant to provide information on linguistic accuracy or pragmatic appropriateness.

As many subtle forms of feedback will pass unnoticed by the learner (Lyster & Ranta 1997), it is often necessary for feedback to be explicit enough to draw the learner's attention away from the content and onto form — the form of the language that

constitutes their mistake. Yet, this tends to be quite jarring, and it needs to be repeated numerous times before it sinks in. Such interruptions can shatter a learner's confidence, and make attempting to speak a foreign language an unpleasant experience. Ultimately, it has the potential to cause far more problems than it actually solves (Krashen & Terrell 1983 ; Lightbown & Spada 1999).

A skilled classroom teacher may be able to make sensitive adjustments to the way corrective feedback is provided to students, based on experience and personal knowledge of the student. In a computer environment, however, this is often not possible. Rather than choosing between subtle feedback mechanisms that are ineffective, and explicit feedback mechanisms that are jarring and intrusive, it is critical that game designers form creative feedback mechanisms that can be both unabashfully explicit, yet humorous and playful enough to actually have a positive impact on the learner's experience when they 'make mistakes' (Ravaja, et al. 2004).

Vygotskian-informed framework provides tiered feedback that begins by asking the learner if they notice something wrong with the utterance/context/choice they created. If they are unable to self-correct, more explicit feedback is provided, such as, to take the example above, reminding the player that they are at a hamburger stand and thus selection of relevant food items would help them complete the transaction. Eventually, explicit feedback can be provided in the form of a direct solution (or again, per the above example, feedback could be provided that directly illustrates the implications of certain choices, such as the aforementioned example of eating a car tire). There is a fairly well developed and implementable system called the "regulatory scale" (see Aljafreh & Lantolf, 1994; see also Lantolf & Thorne, 2006, 2007), that provides carefully calibrated levels of creative feedback that could form the starting point for building in feedback mechanisms within gaming environments.

#2 Instruction needs to ensure that learners focus predominantly on meaning; secondarily, however, instruction should still include focus on form

Taken directly from (Ellis 2005)

Many theorists studying the process of second language acquisition distinguish between instruction that is "focused-on-form" and instruction that is "focused-on-meaning." In form-focused instruction, educators work to draw the learner's attention to the ways in which various language elements (phrases, word

order, etc.) are connected together to create meaning. Traditionally, this has tended to be the orientation of most language classes throughout the world. In meaning-focused instruction, on the other hand, learners begin with meaning-rich content and then work to achieve goals that are not just linguistically based. For example, students may each be given clues to about a fictitious murder mystery in the target language, and then work to determine the killer. Although they are using the second language, in a purely meaning-focused classroom students would not stop to learn about the second language. Most theorists studying the issue today feel that neither exclusive form-focus nor exclusive meaning-focus is a satisfactory approach. Long (1997) points out that "Given adequate opportunities, older children, adolescents and adults can and do learn much of an L2 grammar incidentally, while focusing on meaning, or communication. Research shows, however, that a focus on meaning alone (a) is insufficient to achieve full native-like competence, and (b) can be improved upon, in terms of both rate and ultimate attainment, by periodic attention to language as object." Thus, many argue that curricular designers should begin primarily with meaning-focused content, but then secondarily include form-focused instruction as a natural extension of the overall learning experience (Ellis 2005, Mangubhai 2006). In other words, one should bring in form as it is needed and relevant. As Doughty and Long (2003) describe, "the most difficult practical aspect of focus on form is that, to be psycholinguistically relevant, it should be employed only when a learner need arises, thus presenting a difficulty for the novice teacher, who may not have relevant materials to provide." Thus, instruction in a game about the second language should only come after the player has been placed in a situation or context in which they have a genuine need to use a specific feature of the target language.

As mentioned in *Moving Learning Games Forward*, one of the cardinal mistakes for all learning game designers has been to simply design games that separate learning from fun, then alternate between the two. Similarly, almost all language learning games to date have either been focused exclusively on form (My Spanish Coach 2007), or exclusively on meaning (Who is Oscar Lake, 1996) or, in a few cases, alternating between the two (Global English Kids, 2008). Yet, if learning games are to be effective for foreign languages, we need to develop better models for how a focus on meaning and form can proceed in a seamless and integrated manner.

In order to accomplish this, we need to recognize that starting with the language learning objective, then subsequently designing a game around it, is not only doomed to produce a boring game, but will not even produce a pedagogically effective game. Similarly, simply translating an existing game design into the second language, then expecting players to be able to learn from it is no better than locking them in a foreign software store and expecting them to walk out fluent. Rather, good game design for language learning requires us to carefully examine all the games that currently exist and identify activities that require

Theoretical Considerations

Mechanical accuracy is certainly important in high-stake arenas of human written and oral communication, but over-emphasizing form for form's sake is not functionally nor is it pedagogically useful for the development of communicative competence. Alternative approaches to language structure that are rooted in actual language use provide a powerful alternative to structuralist and prescriptivist methodologies. For example, based on a wide range of empirical evidence, Michael Tomasello develops what he describes as a "usage-based" theory of language acquisition. The model is thoroughly functionalist and "based explicitly in the expression and comprehension of communicative intentions (intention-reading)" (2003: 325). Language is used primarily to "direct people's attention to events and entities in the current joint attentional frame" (2003: 325). The model is construction-based with a focus on whole utterances, not isolated words and morphemes, for utterances are "the primary reality of language from a

players to use language. Then, having established a *need* for language use, the next step is to provide players with *support* that allows them to navigate the game interface and learn whatever language concepts they need to complete the task at hand (see principle #3 & #4 for examples). Finally, the player needs to be provided with *creative feedback* mechanisms that will allow them to improve their performance. Through this cycle of need, support and creative feedback, we can effectively embed language pedagogy in a larger meaning-centered framework.

In order to meet lower production budgets and avoid creative challenges, the greatest temptation for language game designers is to focus on words, either as spellings, without any attention to meaning, or as dictionary entries, without any attention to contexts of use. For example, a game like hangman could easily be produced for an entire dictionary worth of words, as the game only requires entering the spelling of each word and not its actual meaning. Similarly, games such as crosswords, that focus on the spelling (or sound) and dictionary definition of individual words, fail to give the learner the contexts she needs to determine how the word is used. So, a game that merely teaches students the words “the”, “durian”, “eaten” and “was” must be seen by those evaluating learning games as being vastly inferior to a game that can support students in learning to differentiate between “The durian was eaten.”, “Was the durian eaten?”, “Eat the durian!”, “Pedro ate the durian.” and “The durian ate Pedro.” Furthermore, such a game should in-turn be seen as inferior to a game that teach learners to differentiate between utterances — language produced for a purpose (or in other words, language in a context), such as: Question: “What about this one [Durian]? / Response: Hmm, about right, I think; take a whiff.”

#3 All elements of the game, particularly communication and input mechanisms, should have a playful spirit to them

If we place meaning-focused activities at the center of a language learning game, one of the most instantly visible challenges is designing an effective user-interface and input mechanism. When activities take place in a classroom, students simply use their voices to talk to one another or their teacher as their primary means of interacting and completing the tasks. In computer systems, the use of speech recognition is still in its infancy, and video games based on it have proved overly ambitious (Lifeline, 2004). Having students type out full sentence responses is, naturally, too slow and cumbersome for use

communicative point of view because they are the most direct embodiment of a speaker’s communicative intentions” (Tomasello, 2003: 325-6). As the early 20th century linguist Vološinov described it, language characterized as a system of normative forms is a scientific abstraction (1973: 98); rather, it is “solely through the utterance [or use] that language makes contact with

communication, is imbued with its vital power, and becomes a reality” (1973: 123). Especially in foreign language development, there is a case to be made for a focus on what actual people actually do – the process-ontology of human communicative acts and processes – that non-meaning (i.e., grammar and structure based) approaches inadequately acknowledge (see Thorne & Lantolf, 2007). To better integrate form and meaning within a usage-based understanding of language development, we suggest adopting a language awareness framework that emphasizes having learners/communicators gain understandings of the implications of language form as it relates to the production of meaning and social actions. Within a language awareness framework, meaning and form are bound up together as a holism. Language structure (lexical choice, morphology, syntax) is what produces meaning, and the goal is to enhance learners’ capacities to leverage discrete linguistic elements to carry out informational-semantic and pragmatic actions (for a discussion, see McCarthy & Carter, 1994; Thorne, Reinhardt, & Golombek, 2008).

in a video game. Thus, most games simply provide students with menus offering choices of pre-constructed sentences to choose from by clicking on them with their mouse. Yet, this removes the process of constructing a sentence from the student, making it questionable what, if any, learning of language forms is taking place.

One of the best ways to address this problem is to examine how it has been addressed in other fields. Making computer programming accessible to early learners has always been a challenge. In order to make even a simple program, beginners need to learn the precise usage, syntax and ordering for a myriad of commands and control structures. Forgetting even a single semicolon could mean learners would never see their program succeed. In order to make programming more accessible to early learners, Seymour Pappert and his colleagues created the Logo programming language. In Logo, learners were given a specialized learner language with an extremely simplified set of commands and syntax, much the same way a language curriculum might try to focus on teaching a very specific domain with activities designed to elicit only easily understood tense structures. For example, programming simple behavior for a game character could look like this ([Begel & Klopfer, 2004](#)):

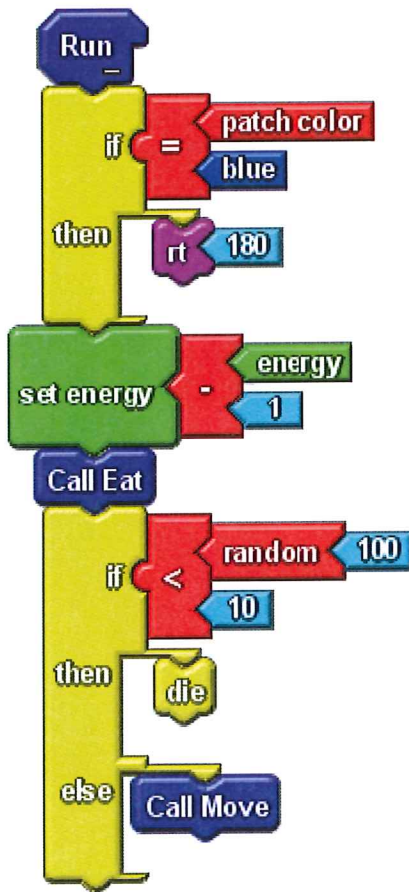
to run

```
if pc = red
  [ rt 180 ]
  setenergy energy — 1
  eat
  ifelse (random 100) < 10
    [ die ]
    [ move ]
```

end

Yet, even this simplified language proved intimidating for novice learners. Some would simply write “if red”, without realizing that a conditional requires properties on either side of the equals sign ([Begel & Klopfer, 2004](#)), much as language learners might forget the number of complements required by a particular transitive verb. Some would forget which commands needed to be bracketed, and which ones didn't. Others would simply forget the names of different commands (the ‘vocabulary’) needed to accomplish particular tasks.

In the current version, StarLogo TNG ([StarlogoTNG, 2008](#)), the developers choose, instead, to give students an entirely new graphical mechanism for entering commands:



As illustrated, students are given a series of puzzle pieces, each representing a particular programming command or property. Students construct the program by snapping together puzzle pieces. Anytime they forget the programming language, the system provides them with visual support. If students were to try to connect the “if” block to the “blue” block, they would observe that the triangle edged “blue” piece does not fit into the crescent shaped “if” hole, a fact which visually confirms that the two word types are incompatible. Similarly, if they tried to say “if = blue”, they would see the empty hole for “patch color”, requiring them to specify what needs to be compare with “blue.” If a student forgets which words are available to them, they can simply browse through catalogs of shapes filled with the specific connectors that they might need. In this way, what to an outside observer might look like nothing more than colorful animated bricks turns out to provide crucial feedback for users learning the system. The interface still allows the rapid construction of statements but also forces learners to think through all of the steps in that construction.

#4 Metalinguistic descriptions and terminology should be presented through optional supporting material, not as part of the core gameplay.



(from Lightbown and Spada, 1999)

Battleship Answer the following question (medium)

Start over

accusative prepositions (they are followed by nouns and pronouns in accusative case)

- durch, für, ohne, um, gegen
- wegen, während, trotz, statt, anstatt, angesichts (in view of), außerhalb/innerhalb (outside/inside of), beiderseits (on both sides of), diesseits (this side of), jenseits (on the other side of), laut (according to)
- an, auf, hinter, neben, in, über, unter, vor, zwischen
- aus, ausser, bei, mit, nach, seit, von, zu

You have:	Enemy has:
Battleship 1	Battleship 1
Cruiser 2	Cruiser 2
Frigate 2	Frigate 3
Submarine 2	Submarine 4

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(from Quia.com 2009) "Focus-on-Form" in a video game should look like principle #3, not like this.

When designing levels and goals for a language game, it will be necessary to carefully sequence and structure game content in such a way as to ensure that players are exposed to a wide range of linguistic and pragmatic resources they will need to communicate effectively. For example, designers

could draw from a corpus (i.e., collection of texts that can be computationally analyzed) of naturally occurring communication that would provide real-world examples of present, past, perfect and past-perfect tenses in indicative, conditional and other relevant moods, so that they can find ways for each to be encountered within the game. However, the systems used by designers to organize learning concepts is often not the most useful structure for learners. It is generally not necessary — or desirable — to place such metalinguistic information as central feature of the game; nor should the game require players to name the grammatical categories and other metalinguistic concepts in order to make progress in the game, so long as they are able to use them successfully. In fact, many of the best selling language learning titles (like Pimsleur and Rosetta Stone) take the extreme position of forgoing any mention of metalinguistic terms at all. Just how much metalinguistic description and other forms of explicit instruction should be provided in traditional classroom language learning environments remains controversial. Some students find it helpful; others find it more confusing than useful. Similarly, language acquisition theorists have wide ranging disagreements as to how, or even if, explicit metadescriptive instruction is useful in the overall language learning processes. In light of these doubts, researchers tend to agree that, while some conceptually oriented explicit instruction is likely to be useful (see related sidebar for discussion), the primary goal and orientation of the orthodox language curriculum should be to create conditions where discrete linguistic elements play a salient role in meaningful communication, which in turn raises awareness of language form as a resource for carrying out goal-directed actions (Ellis, 2005; Schmitt, 1990; Lantolf & Thorne, 2007: 218)

A classroom teacher planning a lesson has to decide how much time to give to explicit instruction (i.e., declarative knowledge about language) and how much time to give students to practice and proceduralize knowledge (e.g., DeKeyser, 2007). Rather than struggling with the same dilemma, designers of interactive systems can and should offer options that adapt to an individual learner's preferences and challenges. In the light of research findings about meaning-focused and form-focused instruction, a three-tiered approach to presenting new language concepts within a video game would seem to be most effective: at the top level, a player's initial interaction with the game would focus entirely on trying to accomplish a task, without presentation of corresponding linguistic terminology, categories, or analysis. Players who have already managed to master the relevant language elements can proceed to the next stage.

If players do not succeed simply by focusing on the tasks, they can move to a second layer that allows them to consider the language that they have been using in new ways, but that still eschews full grammatical presentation. As described in principle #3, this can be achieved through a variety of mechanisms that take advantage of the multimedia

Theoretical Considerations

Many learners appreciate (and expect) explicit assistance at the level of discrete point grammar and lexical options. Conventional grammatical and lexical aids can be incorporated as 'help' features but should not intrude on the action sequences that govern, and make enjoyable, in-game play. Where possible, it would be useful to include, among ancillary language help features, a variety of treatments that address the conceptual structuring of the world through the target language in question. By this, we mean to suggest that how tense and aspect function in a given language to represent events, or how agency is variably constructed through active or passive voice, or how determiners (in English) explicitly mark a nominal item as directly referenced or generically indexed, offer potential contributions to the longer process of advanced language proficiency. Grammatical resources are, after all, tools to be used to achieve specific and nuanced social action and form a symbolic medium through which to construct the world in particular ways. In addition to the brief examples above,

capabilities of a gaming environment. Finally, as a third tier, students should be able to click on or otherwise interact with the system in order to receive whatever explicit grammatical instruction they still need to understand the forms being highlighted. This third tier would include extensive explanations of grammar terms and language structure. Due to the fact that this tier is available from, but also separate from, the spaces of actual gameplay, it should be as detailed and comprehensive as necessary without worry of displacing or interfering with the primary arena of task-based interaction.

For example, imagine you are a curricular designer looking through a list of grammatical concepts you wish to teach and you realize you need to include a lesson on auxiliary verb preposing, of the sort that occurs in English questions. Whereas 80 years ago, you might have simply entitled the lesson "auxiliary verb preposing", today you would tell students they are to imagine themselves as police interrogators trying to get key information from a prisoner. Conducting such an interrogation effectively will, as a matter of course, give rise to questions that illustrate auxiliary verb preposing, so the subject matter need not be examined explicitly right away. Class activities, such as prisoner interrogation, that are common in task-based language classrooms, have very natural connections to existing entertainment video game models (e.g. *Phoenix Wright*).

Students who have mastered auxiliary verb preposing and other relevant concepts would be allowed to continue with the interrogation with no further pedagogical intervention. Students who need support, however, would be able to receive visual or other inferential cues to help them understand the linguistic forms they need. Placing a question mark at the end of a sentence, for example, could cause the question mark and the auxiliary verb to change color and a shadow image of the auxiliary verb to animate its way to the correct position at the head of the sentence. Students who find this level of support (focus-on-form without explicit metalinguistic description) helpful enough can proceed with the interrogation. If not, they would be able to access a final level of meta-linguistic support that deals with the notion of "auxiliary verb" and its role in question formation.

#5 Learning content should be organized around tasks, not presented taxonomically

Along with grammatical notions, game designers might also feel it useful to keep track of the sequencing of concepts that is found in traditional curriculum design. For example, one might plan the following learning objectives:

Vocabulary Goals Grammar Goals

conceptual material relevant to games that require communication with other players (or non-player characters) could involve pragmatics, defined as "the study of speaker and hearer meaning created in their joint actions that include both linguistic and nonlinguistic signals in the context of socioculturally organized activities" (LoCastro, 2003: 15). Pragmatic norms relating to requests and apologies, for example, differ greatly across languages and speech communities, with a primary distinction being on whether utterances are hearer-oriented ("could you hand me that book please?") or speaker-oriented ("may I have that book please?"). In a recent study involving American native speakers of English and Mexican native speakers of Spanish, the Spanish group demonstrated a marked preference (87%) for hearer-oriented requests (e.g., *Me das un café.*) and the English-speakers demonstrated a marked preference (90%) for speaker-oriented strategies ("can I see your notes?") (Pinto, 2005, cited in Sykes, 2008). Explicit presentation of such preference systems would enable learners to generate utterances "on the fly" that might align more closely with native speaker pragmatic norms.

Level 4	Colors	Question Formation
Level 5	Food and Drink	Negation
Level 6	Parts of the Body	Relative Clauses

This would ensure that a broad range of language concepts is covered in a game. However, arbitrary taxonomical sequencing, such as the one shown above, presents a number of problems for language acquisition. Across cultures, this may not be the best way of sequencing material for human memory systems (Anderson, et. al 1994); and Vercoe (2006) argues it to be particularly problematical for Asian cultures:

Research has shown that if language is instructed via relationships there are greater opportunities for vocabulary retention (Nation, 2000). At present, for example, when students encounter colours in English textbooks they are often taught all at one time, a wonderful taxonomical grouping. It should come as no surprise that days after instruction students sort-of know that “red” is a “colour” and “green” is a “colour” but which colour is red and which is green is hard to remember. By the instruction of one colour and another noun with a relationship “Green frogs live in a river,” there is a far greater chance that students will retain the vocabulary (Nation, 2000), both of the target colour as well as the nouns frog and river, as opposed to collectively grouping “Animals” and “Bodies of water” or “Places to live” in another lesson. Grouping things in a textbook or lesson is perhaps still useful in form of review and this is not to suggest that Eastern learners can’t be instructed taxonomically however; It would seem clear that using a “relationship-based instruction model” would have far greater success in the teaching of English to Asian students ...

When a Japanese mother sits down to play with her child, she speaks mostly in relationship words (Fernald & Morikawa, 1993; Nisbett 2003), “I give the vroom vroom to you. Now, give it to me. Thank you.” An American parent would be more inclined to talk with object words “Here’s the car. It has nice wheels” (Nisbett, 2003). Relationships become very fundamental in Asian thinking and influence a great deal of the way their world is created, where European/Americans tend to be prepared for a world of objects.

In tests (Ji et al, 2004; Nisbett, 2003) both Western and Eastern subjects were shown pictures of a chicken and grass and were asked to group them with a cow. Most westerners have tended to group the chicken and the cow, and justifying their answers by thinking taxonomically, (both are animals); yet most Eastern subjects would group the cow and grass, thinking via relationships (cows eat grass).

One possible solution would be to take words and concepts and evenly spread them across the game — i.e. level 1 will teach “red”, level 2 will teach “green”, level 3 will teach “blue.” This, however, would be both a nightmare for the curricular designer to keep track of for every concept and for the game designer to construct genuinely engaging contexts for eliciting language-need from the player. Alternatively, rather

than starting with the categories for words and concepts to be taught in specific lessons, our curriculum should start with the question “what are examples of some foreign-language dependent tasks we want the learner to be able to accomplish at the end of this game?” Perhaps we would chose “being able to purchase items from a store.” The game designer might then incorporate a task in which the player needs to purchase a red potion from a shopkeeper in order to complete the mission. In this way, the language from different content areas — greeting the store keeper, question formation (asking the price), numbers & currency, color (red), etc — would already be woven together in a functionally and contextually rich form. Game designers and curricular designers will need to work together in an interactive and bi-directional manner to ensure the game covers a range of real-world outcomes.

#6 New concepts should be introduced gradually and interspersed with other content before requiring difficult responses from players

For some, this principle may seem counter intuitive. If a student shows difficulty with a particular concept, why not focus on fully mastering it before moving on and adding even more new language concepts? Unfortunately, language acquisition is an extremely complex process, which defies the efforts of curricular designers, so it is important to maintain a sense of flexibility, and an awareness of possible developmental constraints among learners. As Doughty and Long (2003) note:

There is also strong evidence for various kinds of developmental sequences and stages in interlanguage development, such as the well known four-stage sequence for ESL negation (Pica, 1983; Schumann, 1979), the six-stage sequence for English relative clauses (Doughty, 1991; Eckman, Bell & Nelson, 1988; Gass, 1982), and sequences in many other grammatical domains in a variety of L2s (Johnston, 1985, 1997). The sequences are impervious to instruction, in the sense that it is impossible to alter stage order or to make learners skip stages all together (e.g., R. Ellis, 1989; Lightbown 1983). Acquisition sequences do not reflect instructional sequences, and teachability is constrained by learnability (Pienemann, 1984). The idea that what you teach is what they learn, and when you teach it is when they learn it, is not just simplistic, but wrong...

The question, then, is how to harmonize instruction with the learner’s internal syllabus, with so-called “natural” developmental processes. TBLT does this in a variety of ways, first and foremost by employing an analytic, not synthetic, syllabus, thereby avoiding futile attempts to impose an external linguistic syllabus on learners.

Lightbown and Spada (1999), reporting on the findings of Pienemann, Johnston, and Brindley (1988), outline the developmental stages that all learners from a variety of first language backgrounds go through when learning to form questions in English:

Stage_1	Single words, formulae or sentence fragments	'Four children' 'A dog?'
Stage 2	Declarative word order	
Stage 3	Fronting:	
	wh-fronting, no inversion:	'Where the little children are?'
	do-fronting:	'Do you have a shoes on your picture?'

	other-fronting:	'Does in this picture there is four astronauts?'
Stage 4	Inversion in wh- + copula and 'yes/no' questions	'Is the picture has two planets on top?'
	wh- + copula:	'Where is the sun?'
	Auxiliary other than 'do' in 'yes/no' questions:	'Is there a fish in the water?'
Stage 5	Inversion in wh- questions	
	inverted wh-questions with 'do':	'How do you say [proche]?'
	inverted wh- questions with auxiliaries other than 'do':	'What's the boy doing?'
Stage 6	Complex Questions	
	question tag:	'It's better, isn't it?'
	negative question:	'Why can't you go?'
	embedded question:	'Can you tell me what the date is today?'

While it may be possible for a stage 1 student to memorize all the rules necessary to pass a test for stage 6, this knowledge generally does not enter into their everyday "interlanguage" and is frequently forgotten soon after. Curricular materials attempting to dictate how and when students will acquire a particular concept have largely failed (Lightbown and Spada 1999), and video games should not expect to achieve this either. Rather, by distributing various game tasks requiring concepts such as question formation throughout the length of a curriculum, we allow students to progress from each stage to the next as their internal system is ready to do so.

One proven mechanism for spreading the acquisition of complex linguistic material through the duration of a game is to progressively require more difficult forms of responses from players. For example, a game might be designed in which players at level 1 only overhear more advanced constructions, such as question formation, but are not actually required to use them in any way. They would not have to start using them until a later level, say level 3, when they would be required to respond to questions but not ask (Ellis 2003: 43). Then in level 5 they might be placed on a team where they work together to perform tasks that require correct production of questions. Not until level 7 would they actually be required to form questions on their own. In this way, players could progress from level to level through the game without being penalized for not having completely mastered receptive and productive skills; if they do master a concept early, they would be rewarded through means other than level progression (e.g., by social recognition from their teammates).

#7 Assessment should intelligently track free production tasks throughout the game, not simply measure controlled production during test events

If we accept that making mistakes is a natural part language learning, and that "The idea that what you teach is what they learn, and when you teach it is when they learn it, is not just simplistic, but wrong" (Doughty & Long, 2003, above) then the most immediate challenge for curricular designers is to come up with a coherent assessment strategy. Assessment is further complicated by the fact that mistakes are often signs of progress. For example, parents of children learning English know that they begin by using the word "went" correctly, but then later, start using "goed" instead, generalizing from the regular past participle formation. Some parents might be alarmed at this and try, unsuccessfully, to teach their kids to say "went" again. Most, however simply find it cute, and sure enough, without any specific intervention,

the child will naturally resume using “went” correctly again.

In adult second language learning the picture is considerably more complicated. While some errors may be part of a natural progression, others can be unique to a learner’s particular situation, and need to be addressed explicitly. Over time, skilled teachers will usually have a sense of where each of their students is in their language learning. With a computer system, however, this becomes extremely difficult, as we lose all affective and other means of understanding a student beyond simple algorithmic calculations.

Although the gaming environment may be incompatible with many of the traditional ways of evaluating student progress, it also makes available new forms of assessment. It is therefore critical that we identify each of the different assessment possibilities available to us and use them to our advantage. First and foremost, a teacher can only assess a limited amount of content along a limited number of criteria. In cases where teachers are overwhelmed by the number of students they have, assessment often gets reduced to checking to see if a student can correctly construct a sentence with a particular language feature or not. Yet, it is almost never the case that a student’s knowledge can be measured in absolute terms, all or nothing, right or wrong.

Some theorists (Schmidt, 1990) observe that even if two students make the same mistake, the one who is able to notice his mistake is significantly further along in the learning process than the one who can’t (see also Dynamic Assessment, e.g., Lantolf & Thorne, 2006: 327-357). Consequently, game designers should find ways to discern if a player is aware of the nature of the mistake. If so, the game’s feedback mechanisms can give partial reward to the player for having achieved that much, while at the same time, providing contingent feedback so that he or she can do better. As noted in the prior principle, students can reach a point at which they understand a language feature when they hear it in conversation, but are not yet able to produce it on their own. Many theorists argue that, for early learners, this may be a more important milestone than the ability to produce the target feature (Krashen & Terrell 1983). Regardless of which is more important, players can certainly be rewarded in a game for reaching such a level of understanding.

Further on in the learning process, players may actually be able to produce the target language correctly, but only in certain contexts and may be unable to use it productively in others. This level of ability is of little real-world use, but is the level that is most commonly tested in traditional classrooms (Norris & Ortega, 2000). Rather than stopping at this point, game assessment systems should continue tracking and rewarding players as they further their language competency. For example, at a more advanced stage, players might be able to productively use a target language feature across a number of contexts, but only while concentrating on the use of that target feature. In a final stage, students would be able to comfortably and spontaneously incorporate a new concept into their everyday speaking and writing. This is by far the most important measure of mastery, yet it is also the hardest to assess in a traditional environment and therefore often overlooked. In a game environment, however, assessment systems can run in the background, adjusting to every action a player takes. This, of course, needs to be balanced with giving the players the freedom-to-fail and make mistakes — even on purpose. But it opens the possibility of recognizing when a player has exhibited sufficient spontaneous language use to demonstrate true mastery.

Policy Implications

For teachers who are used to evaluating students through timed, free-standing tests given to groups of students together, assessment in a gaming environment will

Relevant Research

Assessment that highlights ecological validity — meaning approaches with direct linkages between the language learning context and language assessment process — are highly relevant to the tracking of language

require a considerable shift. Good teachers make continuous, informal judgments about students' progress, adjusting their teaching to remedy perceived problems. Testing then, is a way of confirming such judgments so as to provide objective data for grading and administrative decisions. With communicative learning of all kinds, and particularly with learning in a game environment where there is no fixed text and no fixed repertoire of features, teachers have to find ways to quantify their informal assessments with different kinds of measures, not just by projecting from components of the communicative act (grammatical patterns, translation, etc.), but also by examining the actual communicative process. At the local level – classroom testing – students will have to demonstrate their abilities in interviews, presentations or other activities that show their ability to use language in communicative settings. They will also need to be evaluated periodically in global terms, so that they know their progress on a general scale, and so programs can evaluate the effectiveness of their teaching and make appropriate policy decisions.

development in gaming environments. Assessment of this sort would include examinations of language production data from participants while they are engaged in “naturally occurring” in-game communication. Examples are analysis of the use of synchronous chat tools that serve to help players coordinate group activity, essays or other prose writing done to flesh out a character and his or her role in a game based narrative, or voice communication using VoIP that is concurrent with coordinated group game play. Computational tools and corpus linguistic techniques have been used extensively for such purposes. Recent corpus-informed assessment and pedagogy projects have had learners compare corpus data from expert speakers with that from learners, including their own production (what Seidlhofer (2002) terms ‘learner-driven data’). There are many benefits to exposing learners to both expert and learner corpora and corpora-based materials, including the opportunity to notice the differences between their own and expert production, and to negotiate and interact with other students, teachers, and experts during the learning process. Recent corpus-based studies have demonstrated how learners were able to develop awareness of the pragmatic consequences of their own usage (Vyatkina & Belz, 2006) and to experience “technology-enhanced rhetorical consciousness raising” (Lee & Swales, 2006: 72).

#8 Consider the Full Range of Gaming Platforms Available

Thirty-five years ago, video games were confined to dedicated arcade centers in which players would feed coins into machines every few minutes in order to take a turn on a particular game. This limited the development of video games at that time to very specific forms: those that could be played in as short an amount of time as possible, while still enticing players to want to keep playing and pumping in coins. A complex strategy game requiring hundreds of teammates to spend days planning and coordinating a single move, for example, would have been entirely out of the question.

Today our stereotypical notion of what a video game is often resembles what was the only possibility a decade ago: a relatively lengthy, self-contained experience to be packaged on a cd-rom and distributed to players. Yet, with today's technologies, the possible forms that a game can take are endless: it can be a five minute game; it can be a never-ending game that is being programmed as the players play it; it can be played on a complex virtual reality headset; it can be played on a cell phone; it can be played alone; or it can be played collaboratively with half a million players.

Going forward, it will be useful to identify the relative strengths and weaknesses each video game form

holds for language learning. Designers can then select the most appropriate platform for learners, or mix different platforms to construct trans-media learning experiences. Particular consideration should be given to possible interfaces for connecting digital game experiences with the ways in which game activities are already being conducted in non-digital media forms used in classrooms today. For example, in the introduction to this paper we discussed a teacher playing a real-world re-creation of the game *Amazon Trail*. While we discussed some of the downsides to this approach — the increased time the teacher needs to spend on managing the activity, and the lack of mass-scalability to other classrooms — the real-world version does allow for valuable face-to-face dialog and in-class negotiation. Rather than choosing between these two approaches, we could also imagine a hybrid version. For example, students might begin the game at home where the computer or cellphone assigns them individualized roles, lets them customize their characters, then gives them a printout (or cellphone display) preparing them for the tasks they are to accomplish in class the next day. Then, once in class, students engage in face-to-face negotiations of game conditions with other students and make decisions about their journey down the Amazon Trail. Instead of having to spend valuable class time explaining individual roles and tasks to students, the teacher is now free to mentor them in their language use as they proceed with their tasks. For homework, students could report on the decisions and the negotiations conducted in class. The game system then calculates the results of their choices and engages them in activities that prepare them for new tasks to be encountered in class the next day.

#9 Games should allow students to spend extra time in activities they enjoy and to minimize time in ones they don't. Ultimately, instructional activities should be designed to teach students how they can autonomously continue playing similar games or performing similar activities taken directly from the target culture

To a mathematician, learning a language might seem an impossible task: words have to be selected from a vast repertoire; they have to be placed in particular order, then mapped onto sound which involves extremely rapid movements of the organs of speech – the larynx, the velum, the tongue, the lips and so on; then the whole process has to be reversed, with words abstracted from continuous sound waves, and meaning inferred from complex layers of context. All has to happen within milliseconds. And then there are the secondary problems of reading and writing. Yet, given the proper motivation, human beings are able to accomplish remarkable feats when it comes to foreign languages: an American seventh grader interested in the costumes used in Japanese cartoons teaches herself Japanese (Bertozzi & Jenkins, 2007); a Japanese girl who normally avoids ESL, learns to guide New Zealand Ph.D. students around a virtual world of super heroes (Galareau, 2006); a community of Japanese youth learn English in order to participate in an online fan fiction community (Black, 2005); and American undergraduates study Chinese and Russian to play *World of Warcraft* with players who mediate their game play in those languages (Thorne, 2008a).

As intercultural communication becomes increasingly necessary for participation in a global society, we are seeing increasing pressure on curricular planners to improve the efficiency of our foreign language teaching. Yet, as the previous paragraph reminds us, improvement in a learner's affective relation to a foreign language is often a far more powerful influence and predictor of ultimate success in learning it than any discrete structural metric (Schumann 1997). If a newly devised language learning activity gives us the ability to learn 100 new vocabulary words, where a previous one only taught 10, we are still only a minute fraction of the way along the path to fluency. But if that new activity reduces the learner's desire to acquire the language, then a great deal of damage has been done, and the path is essentially blocked. Thus, we must be careful to assess the efficiency of new language learning methods not only for their ability to demonstrate specific learning objectives (vocabulary, grammar, etc.),

but also for their larger impact on the learner's relation to the language (interest and the desire to pursue language learning autonomously).

Video games provide language curriculum designers with opportunities not only to deliver traditional learning content in a highly efficient manner, but also to present the learner with an experience that specifically engages a particular student's interests. For example, consider the use of songs in foreign language classrooms. Currently, a teacher looking to build a lesson around a song must select a song, incorporate it in a lesson plan, and deliver that lesson personally to the students. Choosing which song to use poses a dilemma, since students do not all have the same musical tastes. So if the teacher chooses the latest Britney Spears song, some students may love it and learn much from it; others, however, may hate it, and learn nothing from it or lose interest in the class. In the end, teachers often give up trying to please their students and end up simply choosing whatever appeals to them, as teachers.

By contrast, consider a video games such as *Audio Surf*. Here the player pilots a space ship through an obstacle course, picking up strategic objects. Before entering the space ship, however, the player is asked to choose a song from their own mp3 collection, right there on the hard drive. The game doesn't simply makes that song the background music for the game, it generates the entire race course and sets the obstacle positions on the basis of a waveform analysis of the song. In this way, the most intense moments in the game are perfectly synchronized with the downbeats in the song, and the entire experience feels as though it was meticulously crafted just for that specific song.

Twenty years ago, virtually all video games had a prescribed path which all players traveled along through the arc of the game, sometimes with the possibility of a few branching choices. Today, most of the top selling games are thought of as open-ended playgrounds where players pick and choose which activities they want to play: one player in *The Sims 2* may try to build the grandest house in the neighborhood, while another might focus on narrating a story about their character. One player in *World of Warcraft* may spend hours orchestrating the simultaneous efforts of 39 other players in order to kill a grand boss-monster, while another may spend their time individually hunting down the ingredients necessary to bake a pie. One player in *Civilization IV* may try to win by decimating opponents, some of whom may in turn be trying to win by building a culturally flourishing civilization or space colony.

By designing language learning games that adapt to students' agentic choices and actions, we have the potential continue their interest in learning the language far beyond the length of the game we develop. For example, if we design a game in which the learning objectives were created around song lyrics chosen by the students themselves, we open up the possibility they will continue to listen to that song in their own free time and use it to re-enforce their learning. While a similar approach could be taken with other foreign language media artifacts (comics, television, etc.), connections to other video games would seem the most natural fit for continued autonomous learning. For example, if the objective of a language learning game is for the student to be able to play a separate entertainment video game in the foreign language that appeals to them, this should be recognized as a far greater accomplishment as the acquisition of the words and phrases needed to reach this goal.

#10 Where possible, multiplayer games should provide players with meaningful and distinct roles

The emergence of the internet over the past two decades has fundamentally transformed the potential of numerous fields. Video games and language

Theoretical Considerations

The use of Internet technologies to encourage dialogue between distributed individuals and

learning are no exception. With over a billion people representing nearly a thousand languages digitally interconnected with one another, the internet might seem like an instant panacea for language learning difficulties. However, initial attempts to simply link students who want to know each other's language, expecting them to learn from one another, has had mixed results. More recently, more creative and successful uses of Internet-mediated intercultural interaction for language learning have emerged (Furstenberg et al. 2001; contributions to Belz & Thorne (eds.), 2006). Central to such projects is the idea that the link between partners with different languages needs to be clearly organized and directed towards concrete goals, such as exploring cultural differences and similarities, so that target language linguistic behavior is made visible, problematized and/or made more nuanced, and eventually internalized.

Consider Rebecca Black's (2005) account of the *Cardcaptor Sakura* section of the popular community site fanfiction.net. Although the site was not originally designed for language learning, it serves as a nexus in which American kids interested in learning about Asian culture mentor Asian kids interested in developing their English language skills and vice versa. Here fans of the popular anime series *Cardcaptor Sakura* come together to write and share their own fictional stories set within the *Cardcaptor Sakura* universe. All of the stories are written in English, yet the *Cardcaptor Sakura* universe is based on Asian culture. Thus, each participant comes to the site with either linguistic or cultural expertise which complements the needs of another participant, making all their interactions meaningful, developmentally productive, and inherently bi-directional.

At the same time, while curricular designers have been working to find innovative uses of web technologies to facilitate language learning, game designers have been extending the capabilities of their games, and have opened up entirely new genres of video game. Consider the game, *Savage 2*: Two teams, of roughly 15 players each, work to build a base for themselves while simultaneously fighting to destroy the other team's stronghold. Most of the players on the team

partner classes proposes a compelling shift in second language (L2) education, one that moves learners away from simulated classroom-based contexts and toward actual interaction with expert speakers of the language they are studying. Internet-mediated intercultural foreign language education is premised on the notion that dialogue and other forms of interaction can foster productive, and perhaps even necessary, conditions for developing intercultural communicative competence (see Belz & Thorne, 2006; Thorne, 2003, 2006). Rather than focusing predominantly on language in relative isolation from its use in interpersonal interaction, this approach emphasizes the use of Internet communication tools to support dialogue, debate, collaborative research, and social interaction between geographically dispersed participants. But the goal is loftier than social interaction per se and builds on the hypothesis, described by communication researcher Joseph Walther (1992, 1996), that Internet-mediated relationships have the potential to be hyperpersonal and can involve more intensely frenetic interaction than those which occur in face-to-face settings. This now self-evident potential of computer-mediated communication lies at the heart of most internet-mediated intercultural foreign language learning projects – the aspiration for participants to develop meaningful relationships with one another and to use the language they are studying to do so. Within the Vygotskian framework (e.g., 1978, 1986), developmental progress involves actively resolving contradictions through a process of changes in the locus of control necessary to regulate thinking and action. Object-regulation indicates instances when artifacts in the environment regulate or afford cognition/activity. Other-regulation describes mediation by an expert or more capable peer. Self-regulation indexes an action that an individual can accomplish with minimal or no external assistance. Each of these regulation

play from the perspective of an individual soldier on the ground. However, one player on each team plays the game from an entirely different perspective: that of a commander overseeing the troops from a birds-eye camera. The core of the game then consists of soldiers on the ground working to relay information from their unique perspective back to the commander player in order to find weak points in the opposing team's defenses and vice-versa.

dynamics can involve either human mediation (such as was the case in this example of computer-mediated discussion) or support from environmental sources such as design features of a gaming environment (for SLA related applications of this approach, see Lantolf & Thorne, 2006, 2007).

One popular task often featured in foreign language curricula today is the "information gap" task: students seek information from each other in order to complete a task. David Nunan (2005) gives the following example, in which students are each given a table showing when their friends are free and when they are busy. Their task is to ask questions so they can determine when their friends are free to go and see a movie. Thus students initiate interchanges such as the following: "Is Karen free Sunday afternoon?" "No, she's going shopping"

Student A

	Friday Evening	Saturday Afternoon	Saturday Evening	Sunday Afternoon	Sunday Evening
Bob	Working Late		Meet boss at airport		Prepare for a meeting
Karen		Free		Go Shopping	
Philip	Free		Free		Free
Joan		Take car to garage		Baking Cookies	

Student B

	Friday Evening	Saturday Afternoon	Saturday Evening	Sunday Afternoon	Sunday Evening
Bob		Go to meeting		Free	
Karen	Clean apartment		Go to visit aunt in hospital		Free
Philip		Play tennis		Study for exam	
Joan	Free		Go to concert		Free

While many theorists have recognized the value of information gap tasks in language instruction (Prahbu, 1987), most feel there is much room for improvement. Pica and Doughty (1985b: 246, cited in Ellis, 2005), in a study that tried to determine the sort of classroom format that would best facilitate information gap activities, concluded that "neither a teacher-fronted nor a group format can have any impact on negotiation as long as these tasks continue to provide little motivation for participants to

access each other's views."

The example task above, while certainly a task one might encounter in everyday life, is not one people usually engage in for entertainment purposes. Rather it is one most people only do when they really are trying to arrange a time for friends to see a movie together. Thus, it should not come as a surprise that some students find little motivation in performing what might otherwise be considered a chore – but in an unfamiliar language. By contrast, many of the tasks players undertake in order to complete a video game are initiated by real needs to communicate information between players. In fact, the tasks are, by definition, designed to be so engaging that players are willing to do them in their free time. Curricular designers can capitalize on the enthusiasm for such activities by identifying existing game mechanics that naturally encourage students to collaborate, and then incorporating those experiences into a larger pedagogical framework.

Genres

As the capabilities and possibilities for video games have evolved, the medium has developed numerous distinctive genres, each with their own conventions. Within each genre, it is important that we consider the relative strengths and weaknesses each holds in relation to language learning.

Puzzle Adventure Games

Easiest genre to deploy in a classroom environment, with plenty of games already in existence.

Puzzle adventure games such as *Grim Fandango*, *The Curse of Monkey Island* or *Sam and Max* are the easiest games for teachers to bring into their classrooms. In these games, players take the role of the protagonist in a story in which they interact with a variety of characters to solve mysteries and puzzles. In a classroom setting, teachers can simply project the game to the front of the classroom, then have the students tell them how to direct the protagonist. By giving commands to the teacher, students have opportunities to practice imperative forms, the copious dialogs leaves numerous openings for teachers to break down and explain new language in a natural manner, and the puzzle tasks give students chances to debate possible solutions among themselves. The fact that these games only require a single computer and a projector dramatically reduces the technical requirements. Another plus is that most titles in this genre have unobjectionable content. Their low learning curve and high narrative content make these games compelling to wide audiences and to non-gamers.

Simulation Games

Most flexible for deploying existing games in a

Integrating gaming with formal education: Bridging activities as a language awareness foreign language pedagogy framework

Just beyond the tech-sex appeal and monitor halos rest the same issues and questions that have confronted teachers and researchers for decades (and millennia): What will (or should) students learn? How are the task and situation structured? How are students to demonstrate new media savvy and how will this be measured and evaluated? At the same time, as reproduction of analog epistemology and classroom hierarchy flourishes in this new era of digital education (witness many of the precisely modeled simulacra of educational settings within Second Life, for example), in other quarters, implicit understandings of the representation, expression, and organization of knowledge and discourse become problematic, as Internet-mediated realities challenge the adequacy of conventional classroom practices, in part because formal educational contexts and objectives often have limited relevance to the immediate, and mediated, social, communicative, and informational needs of

classroom setting

One video game genre particularly well suited for beginning learners in classroom settings is simulation games. Here players are placed in charge of managing a complex system – e.g. running a city, directing an ant colony or operating an amusement park. Ironically, the best selling computer game of all time is one in which players simulate ordinary everyday life. In *The Sims*, players first create a virtual family by specifying physical attributes, clothing and personalities for a set of family members. Next, they are given a budget for constructing a house for the family to live in. Once they have moved the family into the new house, players essentially author a story about the lives of that family. Described as a “virtual doll house” (Wright 2003), *The Sims* requires players to balance the wants and needs of their characters while helping them to advance their personal lives: finding jobs, making friends and improving their capabilities. In the process, players direct their characters through daily tasks such as washing dishes, cleaning the bathroom and relaxing by the television.

With its focus on everyday activities, The Sims series turns out to match up surprisingly well with the content of typical introductory foreign language classes (parts of the body, parts of the house, professions, etc). Rather than having to use the ‘edutainment’ language learning video games currently available, many instructors have opted simply to use the foreign language versions of mainstream games in their classrooms. For example, Felix Kronenberg has students in his German class use *The Sims 2* to generate stories in German about the lives of the characters they create (2007). Similarly, Mylene Catel (2008) imports characters from her French literature class into the game, then directs her students to use the game to author extensions to the story world by playing out the everyday lives of those characters. Richard Sanford and his colleagues (2006) report on similar experiences with French teachers throughout the U.K. Others (Miller & Hegelheimer 2006; Ranalli 2007) use the game in ESL classes to stimulate interest in reading and to expand learners’ vocabularies. Purushotma (2006) describes how the

students.

Online multiplayer games are massively popular, with some games involving millions of players worldwide (e.g., World of Warcraft, Blizzard Entertainment). As discussed throughout this paper, gaming environments have been shown to provide opportunities for immersion in distinctive linguistic, cultural, and task-based settings that have tremendous potential as sites for designed experience and learning (see Barab, Arici, & Jackson, 2005; Gee, 2003; Squire, 2003, 2006; Steinkeuhler, 2004) and for language learning in particular (Purushotma, 2006; Sykes, 2008; Thorne, 2008a). An array of specific literacy practices are associated with such games that utilize language and other in-game semiosis to develop strong “projective” identities, defined as long-term and usually consistent identities that players project onto their in-game characters (Gee, 2005). However, integrating gaming-based language activity into traditional educational curricula and institutions poses a number of challenges.

To enhance possibilities for agentive language use by foreign language students, one pedagogical proposal, called “bridging activities” (see Thorne & Reinhardt, 2008; Thorne, 2009), is to have students themselves select and bring in non-traditional examples of communicative interaction or texts — for example, online discussions and chat logfiles relating to game play — that they find to be interesting, puzzling, or are curious about. With appropriate teacher assistance, the next step would be to stylistically analyze the texts, asking – “why do certain texts and textual or discourse conventions work well (with a given audience, context, and purpose) and others not?” Following this, a comparison can be made between the gaming texts and genre-approximate analog text types produced for school or mainstream media distribution, asking – “what are the patterns of effective language use in gaming environments? How are these

game can be modified to include built-in language learning content. With their inherently open-ended nature and direct relevance to everyday phenomena, simulation games (along with puzzle adventure games) are probably the easiest video game genre to deploy for classroom-based language learning. Since many of the games are already available on the commercial market, little or no programming resources would be needed to create games in this genre that are suitable for language learning. Like puzzle adventure games, only the production of curricular development and teacher training materials would be needed to deploy such games on a wider scale.

Virtual Pet Social Sims

Easiest genre for developing games for young children

At the same time that the original *The Sims* game was being developed, in 1999, two college students were designing *Neopets*, a game world in which fellow students could create virtual pets and play with them online. Their stated goal was to “keep university students entertained, and possibly make some cash from banner advertising” (Headon 2002, Grimes & Shade 2005). By 2003, the site had grown to accommodate 50 million players worldwide with over 2 billion page views per month (Grimes & Shade 2005). Two years later, Viacom purchased the site in a deal valued at \$160 million. Ultimately it has grown to over 150 million players, racking in over a half trillion page views (Neopets 2008).

More recently a similar site, *Club Penguin*, was purchased by Disney in a deal valued at \$700 million. Like *The Sims*, the everyday routine tasks found in these games make them highly amenable to TBLT pedagogy (feeding/clothing your pet, finding them jobs, building them a place to live, etc). Unlike *The Sims* series, their comparatively simpler graphics would greatly reduce a development budget for those looking to create games specifically for foreign language learning. Their highly social nature and the numerous possibilities for players to interact with others from all over the world make them a rich ground for language learning, even outside of the classroom. While popular across all ages and both genders, cf. 39% < 12 years, 40% between 13-17 years, 21% > 18

texts linguistically and stylistically realized? In what ways does language use in the service goal-directed activity within a game differ from conventional classroom discourse?” In practice, both teachers and students would engage with these questions and attempt to develop bridging activities that minimally serve two functions: 1) to highlight attention to linguistic and rhetorical form as they relate to the production of meaning and/or social actions, an important aspect of language use in most all situations, and 2) to increase the practical relevance and contemporary currency of foreign language materials and opportunities for engagement. This represents a move that, under ideal conditions, provides vivid, context situated, and temporally immediate interaction with “living” language use. Bridging activities are not intended to be a replacement for standard texts, reference grammars, and assessment tools. Rather, they are meant to provide a realia counter-weight to the prescriptivist versions of grammar, style, and vocabulary in foreign language texts that typically are not based upon actual language use (for exceptions, see Carter, Hughes, & McCarthy, 2000; Thorne, Reinhardt, & Golombek, 2008). The pedagogical impetus for this approach includes the following:

- To improve understanding of both conventional and internet-mediated text genres, emphasizing the concept that specific linguistic choices are associated with desired social-communicative actions;
- To raise awareness of genre specificity (why certain text types work well for specific purposes) and context-appropriate language use;
- To build metalinguistic, metacommunicative, and analytic skills that enable lifelong learning in the support of participation in existing and future genres of plurilingual and transcultural language use;
- To bridge toward relevance to students’

years; 57% female and 43% male for *Neopets* (Grimes & Shade 2005), these games are particularly well suited for younger learners. What makes this genre most interesting for language educators is both the possibilities and the dangers surrounding their business models. Part of Neopet's early financial success was the degree to which commercial advertising was not restricted to advertising banners across the top of the game, but pervaded every aspect of the core game play itself. Consider, for example, what happens when a player enters the "Coca-Cola Diner":

communicative lives outside of the classroom; and

- To increase student agency in relation to the choice, content and stylistic specifics of the texts contributing to the language learning process.





Ravip says 'I can't wait to come back and have another bottle of Coca-Cola tomorrow!'

Feed another Pet

Back to Coca-Cola Diner

We can imagine why this revenue model presents problems in the context of learning games. Educators would not want commercial branding to dominate their mathematics curriculum; nor would advertisers be enthusiastic about their brands being associated with certain school subjects. However, language learning may be a different case. For advertisers, an ESL class could influence a student's entire understanding of a foreign culture and lifestyle — and so if the gaming environment were suitably engaging, they might be quite eager to sign up. Educators are already used to seeing role-play activities in the language learning classroom along the lines of someone ordering a 'Happy Meal' from a McDonalds restaurant. Changing the branding for already existing activities from MacDonaldis to Burger King or Pepsi would be relatively easy, and might arguably be a small price to pay to ensure the development of engaging curricular materials. The challenge will be to determine to what extent and on what terms commercial interests should be allowed to encroach on the language learning enterprise, and to pre-emptively find ways that would empower kids to respond to attempts to manipulate them (Buckingham, 1993).

Web-based Strategy

Easiest genre for developing games for older students at more advanced levels

For older students at more advanced levels of language learning, multi-player strategy games can be

powerful catalysts for engaging them in extensive foreign language conversations. Additionally, web-based strategy games can be highly engaging and popular, yet still remain easy to access and relatively inexpensive to develop. For example, the popular site Travian.com features nearly a million active users across numerous countries and languages, yet the core was programmed by Gerhard Müller, a 22-year old chemical engineering student at the Technical University of Munich (Galaxy News 2005). On the English version, participants from all over the world engineer complex alliances to ensure the prosperity of their city. Because those who are able to form alliances across linguistic boundaries have a distinct advantage, players are willing to expend considerable effort tutoring alliance members so they can understand the various forms of communication taking place within an alliance. Such games could easily be incorporated in a mid-advanced level classroom where students report on and aid one another in their interactions with players from the target country.

MMORPG — Massively multiplayer online role playing game

Most comprehensive genre for high-budget development

While they are also the most challenging to implement successfully, MMORPGs likely hold the greatest range and potential for designing an immersive language learning environment. It is also important to keep in mind that the term “MMORPG” can be applied to a number of vastly different games. At the top end, an MMORPG like *World of Warcraft* carries a development price tag of \$60 million (Koster 2006) and would be far too expensive to duplicate with the specific purpose of learning a foreign language. This is especially true when one considers that fact that the research and development needed to make any game effective for language teaching multiplies its design budget considerably. There are, however, numerous suggestions and reports focused on adopting and adapting existing top-end MMORPGs to be used within language learning environments (Byrant 2007, Roy 2007, Thorne 2008a).

To present one example, Thorne (2008a) describes an impromptu dialogue between two World of Warcraft gamers, one American and the other Ukrainian. Both are battling computer-generated foes in the same area, when the Ukrainian sends the following message to the American: “ti russkij slychajno?”, to which the American replies with a question mark. Approximately 150 lines of dialogue ensue that include introductions, statements of real world location, discussion of game strategy, common interests in music, and attempts at using Russian by the American (with the help of solicited “just in time” messages from a Russian speaking friend via Instant Messenger). The matrix language for this interaction was English but three languages (including multiple uses of Russian and one instance of a Latin aphorism) were used in total. From a language learning perspective, the conversation was natural and unconstrained by the fabricated (if also developmentally useful) patterns that characterize much instructional setting language use. The transcript shows reciprocal alternations in expert-novice status such that both participants provided language-specific explicit corrections, made requests for linguistic assistance, and collaboratively assembled successful repair sequences. From an ethnomethodological perspective, the social order illustrated by this pair provides significant opportunities for both producing new knowledge and refining existing knowledge about language use, as well as refining World of Warcraft game strategy. In a follow-up conversation, the American student expressed strong interest in studying Russian, in part to improve his World of Warcraft in-game experience with Russian speakers. He also reported that another student in his dorm, a highly enthusiastic gamer, had already begun to study Chinese with the primary goal of more fully participating in Chinese language-mediated game play. As an alternative to using existing MMORPGs or developing a top-end foreign language specific MMORPG from scratch, a number of services are emerging that enable developers to create such games

at dramatically lower costs by providing them with pre-assembled pieces of a virtual world which they can then stitch together to suit their specific needs. Services like metaplace.com allow for a variety of platforms, including web-based and embeddable games, while services like multiverse.net, opencroquet.org and projectdarkstar.org allow developers to easily construct 3D worlds with virtual avatars. Sykes (2008), for example, describes the use of croquet (opencroquet.org) to develop a foreign language specific Synthetic Immersive Environment (SIE) designed for the learning of Spanish pragmatics. The game, Croquelandia (croquet.umn.edu), integrates many features creatively appropriated from commercial online games to produce explicit, educationally-related outcomes. In Croquelandia, learners engage a variety of goal-directed activities (quests) designed to provide behavior-based corrective feedback through interaction with Non-Player Characters (NPCs), native speakers, and other group members. Interaction within this SIE carries the ultimate goal of enhancing learners' ability to deal with various pragmatic features of L2 Spanish. Initial learner perception and outcome data suggest a positive effect for the use of SIEs for the development of L2 pragmatic awareness (Sykes, 2008; Sykes, Oskoz, & Thorne, 2008).

Alternate Reality Games — ARG

On July 16th 2004, a number of popular website owners received mysterious packages at their doorstep (Szulborski, 2005). The packages were ostensibly from a company named "Margaret's Honey" and included a sample bottle of honey from the company. Included with the honey was a series of cutout letters, including the letters "B", "I", "L", "O", "S", "V" and three letter "E's". After trying various arrangements, a number of the recipients noticed that they could be arranged to form the sentence "I Love Bees", which prompted them, in turn, to try looking up "ilovebees.com." There was, indeed, such a website, and it turned out to display a page for 'Margaret's Honey'. But the site appeared to have been hacked, with strange messages appearing on it:

HALT – MODULE CORE HEMORRHAGE

Control has been yielded to the
SYSTEM PERIL DISTRIBUTED REFLEX.

This medium is classified, and has a
STRONG INTRUSIVE INCLINATION.

In 5 days, network throttling will erode.

In 19 days this medium will metastasize.

COUNTDOWN TO WIDE AWAKE AND PHYSICAL:

32:15:38:10:831

Make your decisions accordingly.

At the end of the webpage was an appeal from Dana, ostensibly Margaret's niece, asking visitors to help her figure out what was wrong with the website. Many recipients then posted entries on their blogs asking readers to help them track down the cause of the hacks to Dana's website. Some of those readers noticed that the images on the website were scrambled in systematic patterns; ultimately they turned out to hold encoded messages within them. Rather than answers, however, those messages contained other, even more perplexing messages that brought viewers even deeper into the world of *I Love Bee's*, requiring them to invite even more friends to help. Ultimately, *I Love Bee's* swelled to include over 600,000 players world wide, making it one of the largest pools of collective intelligence assembled for one of history's most challenging scavenger hunts.

As the game unfolded, clues lead players to a series of GPS coordinates and time codes. Each of the GPS coordinates corresponded to one of 40,000 payphones scattered across the 50 U.S. states and

across 8 countries. These would ring at a specified time. Through the network of 600,000 players, and with effective use of various communication technologies, players were able to identify places and relay instructions to players near key payphones scattered across the globe, all within 20 seconds of notification (McGonigal 2005). Answering the payphones, players received 15 second fragments of a 6 hour radio drama, which they then reconstructed on the web. At no time in the course of the events triggered by the arrival of packages from the Margaret's Honey Company was the activity clearly categorized as a game. Players did not open up a game application to enter a 3D-rendered world, then close it down when they were finished. The technologies used were familiar (blogs, wikis, websites, etc) and were geared to solving real-world problems and challenges. So how did 600,000 players find the game interesting enough for them to invest their free-time in learning how to use everyday technologies?

The director of I Love Bees described the core mandate of his game design philosophy as "to create puzzles and challenges that no single person could solve on their own." (McGonigal 2007). By effectively using web collaboration technologies, players learned how to function as part of teams larger than anyone has been part of before, to solve problems more complicated than human beings had ever been able to solve before. In The Beast, a similar game often described as the precursor to I Love Bees, the original designers started with what they estimated to be 30 days worth of content, ranging from what they thought would be "super-easy" to a degree of difficulty so high that "they're going to have to beg us at the end of 30 days to give them hints." Making effective use of collaboration technologies, the first group of players to stumble upon the game completed everything within the first day. From that day on, the designers were in a non-stop scramble to simply throw out the most difficult problems they could imagine (McGonigal 2005).

In the last ten years "WebQuests," that is, activities designed by teachers "in which some or all of the information that learners interact with comes from resources on the internet" (Dodge 1997), have exploded in popularity in schools. According to Google AdSense, search popularity for the term "WebQuest" is now approaching that of the term "lesson plan" (Purushotma 2006). In a typical WebQuest, students are given a scenario which requires them to extract information or images from a series of recommended websites and then to compile their findings into a final report. For example, students might be told they are part of a team of experts brought in to decide on the most appropriate method for disposing of a canister of nuclear waste. They are then provided with a list of websites relevant to waste disposal, and asked to present a final proposal to the teacher. While WebQuests provide a popular theoretical framework for extracting information from new-media sources, there has been little innovation about what to do with the information – other than to use it as the basis of a report. For most students, a WebQuest assignment is an exercise in "overly structured clicking and reading" (Dodge 2005). Quite simply, while many theorists and teachers love WebQuests for their ability to connect students with varied and interesting information directly from the target culture, students themselves are less impressed. The creator of the term "WebQuest", Bernie Dodge, comments as follows (2005): "It's true that most WebQuests are boring, but I think that's because they aren't really well designed, not because they don't have flashy graphics and interactivity. I'd like to think that getting engaged in a problem that requires synthesis and problem-solving is motivating in a deep and useful way that goes beyond Prensky's arcade-game type learning."

If we look closely at the design of Alternate Reality Games, at the core they are, essentially, extremely well designed WebQuests that require synthesis, problem-solving and collaboration of large community of people. Because most ARGs have been financed for the purpose of promoting a commercial product, they have received little attention within the education community. But they do suggest invaluable models

for educators and researchers looking to progress beyond the limits of current WebQuest activities, particularly for language educators looking to introduce students to websites from the target culture.

Language Learning and Video Games

The demographics of Internet-user populations show phenomenal expansion around the world, approaching 1.3 billion individuals as of December, 2007 (as measured by internetworldstats.com). Alongside the burgeoning numbers of Internet users comes a parallel growth in quantity and variety of mediated expression, the everyday forms of participation in civic, professional, and social life, and perhaps most profoundly, the emergence of entirely new social formations that have surfaced only in, and through, Internet mediation (for discussions, see Jenkins, 2006; Thorne & Black, 2007). In this paper, we have suggested that L2 education is entering a particularly critical stage that is marked by an urgent need to examine (and create) gaming environments that are not only learning tools, but which also serve as critical contemporary arenas for task-relevant communication and relationship building. Internet-mediated communication is no longer a supplement to, or practice arena for, communication in everyday life. Instead of merely simulating other modes of interaction, technology-mediated communication is, in and of itself, the real thing that operates as a critically important medium for all manners of human interaction.

These conditions raise questions as to how researchers and language educators might orient themselves to the changing contexts of mediated language use, as well as to which genres and communication tools should be included in instructed second language (L2) curricula. The above descriptions of gaming and new media communication attempts to balance the resources and performance potentials of goal-directed gaming environments with the knowledge bases, analytic traditions, and conceptual-theoretical frameworks that the institution of foreign language education can provide. To be clear, we are advocating an approach designed to engender engagement through the utilization of students' digital-literacy expertise and/or gaming experience or interest, but we seek also to provide encouragement for the development of gaming environments that provide feedback at the level of linguistic form and exposure to and movement toward awareness, and eventually mastery, of a wide range of communication genres, including those associated most closely with traditional literacies and "power genres" text conventions. To achieve this, we advocate the use of a three point sequence when designing video games: genuine player need, linguistic support and creative feedback. Additionally, we argue linguistic support should be provided within a three-layered presentation offering meaning-only focused tasks, multimedia focus-on-form, then meta-linguistic descriptions and conceptual treatments of forms.

The brief examples of gaming and new media literacies presented in this paper also precipitate a number of challenges to the conventional goals and processes of foreign language education, such as the rigidity of the gate keeping mechanisms of high stakes testing that recognize only analog genres, the disconnect between the prescriptivist epistemology of schooling and language use that is appropriate and even necessary for full participation in other contexts (Internet-mediated and otherwise). In an age marked by transcultural and hybrid genres of communication, and in a global arena where in some quarters, "plurilingualism" is already fronted as the goal of foreign language education (witness the Common European Framework of Reference for Languages), these issues will increase in intensity and complexity and must necessarily inform the foreign language educational frameworks of the future.

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