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Creating a Technology-Rich English Language Learning Environment

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Abstract

This chapter presents a theoretical framework for how and why technology can actually enhance language learning. Then the chapter provides a step-by-step process for making decisions about technology use. Teachers must understand outcome goals for the class or curriculum, identify learning activities that allow students to achieve those outcomes, and only then select one or more technology platforms that can deliver those learning activities via task-based assignments. Evaluation of each potential technology should be based on the affordances of the technology. Best practices and examples are provided. In addition, the chapter addresses how technology fits in with the overall language learning environment, including the physical environment, the social/cultural environment, the instructional environment, and the assessment environment. This chapter uses accessible language and is based on the assumption that readers are teachers who do not currently make extensive use of technology.

Keywords

Instructional design · Technology design · Environment · English · Affordances · Motivation · Curriculum

Introduction

Using technology to assist second or foreign language learners is much in demand by students, but many language teachers are not sure where to start in incorporating technology. Their own teachers in years past often used little or no technology, and today's teachers often feel less sophisticated than their students in simply understanding the potential of today's technology for teaching and learning. These teachers feel outside their "comfort zones" when they encounter terminology such as computer-assisted language learning (CALL), mobile-assisted language learning (MALL), and technology-enhanced language learning (TELL). In addition, most academic literature about using technology for English language teaching reports on experimental one-time tests and provides little guidance on how technology can be incorporated into the curriculum over the long term (Chwo et al. 2016). Rather than make an attempt and risk failure, many teachers simply avoid questions of using technology and continue their traditional teaching methods.

Technology, of course, is just one part of the overall learning context the students encounter (Marek and Wu 2014, 2016, 2017). This complex environment includes physical things like the classroom, desks, and comfort (heat/air conditioning). It includes the attitudes of the teacher in managing the classroom – authoritarian, critical, supporting, and engaging. It includes the homelife, jobs, and social relationships of the students that support or distract from learning, and the environment includes the lesson plan and learning activities required to complete the class.

Technology must be part of the lesson plan, used for student learning activities. It always supports a learning activity, but should not be thought of as an activity, in and

of itself. For example, the very simple technology of using a PowerPoint presentation is not, itself, the learning activity. A lecture or student presentation enhanced by bulleted text, diagrams, graphics, or photographs is the learning activity. In a similar way, more advanced technology assists a learning activity, but technology is the “means to an end, and not the end in itself.” Furthermore, this “means to an end” is not the technology itself but the beneficial functions of the technology that result in improved motivation of the students and improved learning outcomes.

So, when considering creating a technology-rich learning environment, remember that the goal is not to simply use more technology. The goal is to improve learning by using technology to enhance learning activities and thus result in outcomes that are more beneficial. The question remains, however, “how do we do this?”.

This chapter provides the answer, leading us through this confusing jungle of ideas in a way that is clear and straightforward. This chapter will help us find the right path toward creating a technology-rich English language learning environment for our students.

It will first look at the theoretical framework for how and why technology can actually improve language learning. Then it will present a step-by-step process for making decisions about what technology to use and how to use it. Every school, academic program, and subject is different, but the chapter will conclude with a list of best practices that will allow us to incorporate technology into our classrooms in a way that is effective for language learning and appreciated by our students.

Why Does Technology Work?

The last several decades have seen great changes in the understanding of how people learn, which helps us understand how to best use technology for learning. These changes are the result of the growth of the field of psychology, which has resulted in a changed understanding of how people receive new information and fit it in with what they already know (Bruning et al. 2011). What psychologists have learned is that lecture/memorization does not promote long-term deep understanding of the subject matter. Many people probably remember the experience of cramming for a test, but forgetting the information within a few days. This is because memorized information from lecture stays near the surface of a student’s memory and is not incorporated deeply, making it easily forgotten when no longer needed for a test.

The modern understanding of psychology reveals that for students to develop mastery of subject matter, they need to “connect the dots” to understand how new information fits with what they already know, because information that is connected becomes knowledge the student can use. The more connections that are made between the new information and what the learner already knows, the better the learner can make use of the information and employ it as usable knowledge, not simply memorized facts. This is called “cognitive psychology,” which means understanding how people think and learn (Bruning et al. 2011). When scholars apply this

perspective to teaching and learning, it is called “constructivism” because it is based on the understanding that students need to connect new information to what they already know, in order to “construct” knowledge and have a deep understanding. The term “social constructivism” recognizes that we learn effectively by interaction with others.

Constructivism requires a very different approach to teaching and learning than lecture/memorization. It changes both the Eastern Confucian philosophy and Western professorial tradition that the teacher is the source of all knowledge. Instead, the teacher is now a guide who helps students discover and understand new knowledge for themselves (Bruning et al. 2011). It is easy to understand that, for example, when students in a physics laboratory repeat famous experiments of the past, it strengthens their understanding far beyond what they would have learned from simply memorizing facts from a lecture.

As a result, we need to take this understanding of how students learn into account when we make our decisions about technology. For example, students have been found to dislike an instructional design that is essentially watching a lecture outside the classroom via video technology (Hung et al. 2017). Constructivism suggests that using hands-on active technology will do the best job of helping students absorb and apply new information (Nunan 1997).

The next section will address how foreign language teachers apply this concept to the English language classroom, as a practical matter.

Learn by Doing

First, we need to talk about the basic principles of “active learning.” Then we will look at how we apply these principles to technology.

Students benefit from extensive opportunities to make “hands-on” use of the language they are learning. Of course, this means using English almost exclusively in the classroom (and the authors know of some English teachers who do not do this). It also means, however, offering students learning materials and activities that provide authentic experiences using and interacting in English, but are not too hard for the students. In this way, students experience success while using English and are motivated to continue learning.

This focus on social interaction is important because in the past, many English classrooms have focused on grammar and other fine details, even though native speakers often do not speak with perfect grammar. Knowles (1980), a pioneer in the theory of social learning, said that it brings together all the concerned individuals, institutions, and associations into a social system that extends the opportunities for learning. There is abundant research showing that social interaction is part of understanding, retention, reproduction, and motivation (Bandura 1970).

Successful social interaction in English, therefore, allows students to test their skills and assess their ability against their peers, teachers, and other English speakers they encounter. Therefore, social interaction is a fundamental aspect of effective learning.

**Have you experienced “learning by doing”?
Describe the experience.**

The authors call this “organic” language learning (Marek and Wu 2011) because it is natural and almost automatic. When learners understand almost all of the messages they receive, they learn subconsciously by filling in any gaps of occasional new vocabulary or correcting grammar to be better understood (Krashen 1988, 2003). This is how children learned their native language. People always use simple language with very young children, who actively “fill in the gaps” of words they do not know, to become more and more capable language users.

This active learning based on interests of the learner can be emulated for older learners, an instructional philosophy known as “student-centered active learning” (Huang and Xia 2010; Myron 1949). We will see in the next section that the right technology choices can greatly benefit student-centered active learning.

Learn via Technology

The benefit of using technology for English learning is that it can provide authentic and organic opportunities for student-centered active learning. Of course, which technology we choose and how students use it are important factors, but the broad availability of authentic source material in our Internet-connected world provides rich opportunities for language learning.

Some students may already be doing this on their own. They visit English websites, watch English videos, and read social media posts. Sometimes it is just for fun, but sometimes it is for the purpose of improving their English. Either way, it is likely that they do learn organically about the culture, grammar, and vocabulary of native English speakers (Lai and Gu 2011).

With this background, it becomes clear that there is good justification for moving away from lecture/memorization and into active learning, incorporating technology. This still leaves many questions, however, about how to make this a reality, especially for teachers who are not confident in their technology skills.

Have you ever had to do tasks in your everyday life using the internet (for example looking for information) that has resulted in learning?

What Is “Technology-Rich”?

Most students are surrounded by technology in their daily lives. They use it naturally and automatically for social interaction, recreation, and seeking out information (Ushioda 2013; Wang et al. 2014). Often called *digital natives* (Prensky 2001), these students “account for a substantial portion of the total enrollment in higher education” (Sarkar et al. 2017, p. 1) and not only accept but desire a similar level of technology in their formal learning, because they are so used to it. In basic terms, a “technology-rich” classroom means that a lot of technology is used, both for in-class activities and for homework. Under this definition, most, if not all, elements of the class employ technology in some form or another. The author’s definition, therefore, of a technology-rich learning environment is *surrounding students with technology that benefits learning*, because traditional methods of instruction, even though used for centuries, now seem alien to today’s students.

If you teach, do you feel your students are digital natives? Do they use and understand technology more fluently than you?

In the process of surrounding students with technology that helps them learn, however, teachers need to make sure that they are not using technology *only* for the sake of using technology. In the kind of technology-rich learning environment that benefits students, all of the technology needs to contribute to learning in a specific and planned way. If the technology is just for show, and does not contribute to learning, then it has no merit. A swamp of meaningless technology will just trap students in the quicksand of worthless time and effort and reduce their motivation for learning, because they are already surrounded by technology and are skilled at making judgments about what is beneficial and what is not.

So, the technology-rich environment will include technology for several kinds of learning activities. Each separate use of technology must be planned and selected to contribute to the learning experience, supporting the students as they achieve beneficial learning outcomes.

The Overall Environment

Although the primary subject matter of this chapter is technology, it is important to understand that technology is just one part of the overall language learning context. In addition to the technology itself, the overall context (Marek and Wu 2014) includes:

- The physical environment, such as the classroom, buildings, desks, and air conditioning/heat
- The instructional environment, such as the assignments, teacher's philosophy about the usefulness of technology for language learning, and learner self-perceptions
- The assessment environment, including classroom and standardized tests
- The social/cultural environment, including the perceptions of parents and the broader culture about using technology for language learning, classroom social interactions, and vast number of social and cultural factors outside the classroom which influence teachers and students

These categories can also overlap. For example, an online learning community could be considered to be part of the technology environment, but it is also primarily a social experience for the students. Similarly, competing against other students in game-based learning is also a social interaction, because of the competition, the comparing notes about the game, and even about the bragging rights. The social interaction is the learning activity, and the technology is the tool to accomplish the activity. The technology, therefore, is about the social connections among people, not just about hardware and software.

It is also valuable for teachers planning to begin or expand the use of technology for learning to reflect on their own teaching philosophies, perceptions of technology, and past experiences. It is beneficial for teachers embarking on such an undertaking to be aware of their own strengths and weaknesses.

Now that the basic concepts of teaching and learning that underlie use of technology have been reviewed, it is time to consider how to make wise decisions about English instructional technology.

Set-by-Step Process

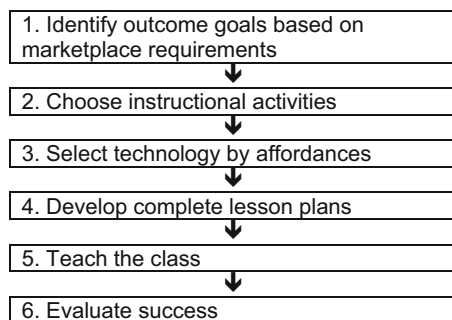
Choosing technology to incorporate into English language teaching is not JUST about choosing technology. Before choosing the technology, it is necessary to know what the technology needs to accomplish. This means performing a thorough analysis of the existing curriculum, the way students use mobile technology, and the instructional goals of the course, so that the technology will fit seamlessly and not be a distraction. This section provides a step-by-step process for making these decisions, summarized in Fig. 1.

Outcome Goals

Any instructional program needs outcome goals for students. Teachers often know these goals implicitly, through their expertise in the subject matter; however, universities and governments often require more formal assessment processes by which goals are set formally, and evaluation is conducted to see whether students are actually accomplishing these goals. Standardized testing, which is common in learning English as a foreign language (EFL), tests proficiency, but also should effectively represent outcome goals, because the score on the test should measure degree of completion of corresponding outcome goals. Academic programs should probably also have additional goals beyond simply passing the test. Once overall outcome goals for the academic program are known, goals for individual classes can be determined, formally by the department or informally by the individual teacher.

It is important, however, to make sure that the goals are not overly optimistic. English learning is incremental, and even students who are well motivated by enjoyable technology will take time to make major progress. This is why physicians

Fig. 1 Instructional technology design process



study medicine for close to a decade before they can work independently as a doctor. For many English students, a full semester of learning may only result in slight improvements, regardless of whether they use technology for learning or not, and their level of improvement may or may not be statistically significant in quantitative analysis.

Nevertheless, it is important that we are able to measure whether students achieve realistic goals. Goals stated in ways that can be measured are called “objectives.” So for each general goal, we must decide how to measure success. Maybe the general goal is for students to be able to interact in English with business customers from other countries. Passing standardized tests can provide one measurable objective, but other objectives are also appropriate. Objectives, such as oral fluency, reflective writing, critical and higher-order thinking, oral fluency, portfolio creation, comfort level doing presentations to groups, cross-cultural understanding, and intercultural communication ability and knowledge, come to mind as examples. For whatever our course objectives, we must know how we will evaluate success.

This means planning how to evaluate success at the end of the semester, *before* we begin teaching, exploring the broad range of criteria that should be examined. In business, these are called key performance indicators (KPIs). In evaluating language learning, one or more KPI measurements may be needed for each measurable objective.

Instructional Activities

For the moment, do not think about technology, but just about the overall way of teaching the class. Each of the main outcome goals for the class will need one of more categories of learning activities. Depending on the class, these activities may include reading a textbook, brief sections of lecture (20 min or less, please), discussion, student presentations, drill and practice, and other activities. The overall lesson plan for the semester combines these activities together into a logical mixture.

In keeping with the strategy of student-centered active learning, we should develop activities that will allow students to learn by doing. Yes, introduction of new knowledge may be more traditional, using textbooks and some lecture, but activities are also needed that will cause students to be active in applying their new knowledge again and again until they have mastered it. This curriculum/instructional design process can be used with any instructional philosophy, but the authors recommend student-centered active learning as the best framework for instructional technology.

The best way to structure these language learning activities is by using tasks, known as task-based language teaching (TBLT) (Candlin and Murphy 1987; Ellis 2009). We can also think of it as task-based instructional design. Tasks are specific things that the students need to accomplish, or problems they need to solve, by a certain deadline, and have clear connections to the outcome goals of the class. In addition, students need to be held accountable for completing the task. In most cases, being accountable means that it contributes to their grade.

It is also helpful to have a feel for how long each task will take an average student to complete. Reading a chapter may take an hour of continuous attention. Vocabulary flash cards can be done a few at a time, requiring as little as a minute or two per session. This knowledge will help later, when consideration of technology begins.

Some of these tasks may be assigned multiple times, such as for the drill and repetition component of a typical language learning lesson plan. Sometimes known as a learning cycle or a learning spiral (Loertscher and Rosenfeld 2007; Wu et al. 2012), this kind of task is repeated multiple times, with students improving their outcome each time.

One way to perform these repeated tasks is by game play, a process called “gamification” (Hamari et al. 2014). Computer and smartphone games should be planned so that students enjoy playing the game, which motivates them to play more. “Winning the game” means that they have achieved competence or mastery of the particular learning task that is the focus of the game level. Because they have repeated the cycle of learning many times, it is more likely that they can make use of the learned knowledge. Although gamification is usually discussed in terms of games played via technology, many teachers also use games effectively as in-person classroom activities.

Where a course uses repeated tasks, remember that students will need more assistance, advice, and support from the teacher at the beginning, but the teacher should give them less support as the number of repetitions grows, to encourage them to be independent and to solve problems on their own. This technique is called scaffolding (Lee 2003; Van de Pol et al. 2010), and it leads to improvement of student confidence and ability over time.

Again, many teachers make these decisions about goals and learning tasks implicitly, because they know their subject matter. In spite of this, it is best to write them down, so that they are fixed and clear, and beware of the mind-set that “we’ve always done it this way.” Make sure to review the educational context regularly, starting again at the beginning with the teacher’s own outcome expectations, those of the students, and those of prospective future employers.

Select Technology

Now that decisions are made about the outcome goals and the resulting learning tasks, it is *finally* time to evaluate which tasks can be delivered, performed, or facilitated by technology. Because there are *so* many technology choices in the world, this step in the instructional technology design process can be intimidating. The analysis of goals and learning tasks just completed will help a lot, but it is still a question of what criteria to use in making technology choices.

Affordances. One of the most important criteria to use is to evaluate the possible technology choices by their “affordances. These are “the qualities or properties of an object that define its possible uses or make clear how it can or should be used” (Merriam-Webster n.d.). In English teaching, the affordances are the benefits or capabilities the teaching tool or method offers. In evaluating the individual choices

for CALL/MALL/TELL technology, the affordances can be thought of as the effectiveness with which an individual learning task can be performed. For any given learning task, some technology choices will serve better than others will.

For example, technology can help with learning tasks requiring repetition. Transferring the role of repetition to the technology can allow the teacher to focus on higher-level instructional functions during the classroom meetings of the class. Technology can also help in tasks requiring social interaction, which tends to engage and motivate students more.

While thinking about the affordances of the technology, also think about the affordances of other ways of performing the learning tasks. We should always ask ourselves which tasks can best be performed during classroom meetings, i.e., in-person rather than via mediated communication.

This thinking will lead to a combination of ways in which students perform learning activities. Many of them will likely be performed via technology, but maybe not all. For some activities, the use of technology may be minor, such as turning in assignments electronically rather than by “hard copy” paper.

Familiarity and Need for Induction. Another important factor in selection of the best technology is familiarity. When a technology required for class is new and unfamiliar, the students tend to become easily frustrated. Common social media platforms, such as Facebook or LINE, will probably be familiar to students, who will only need to learn how to use them for the purposes of the class. On the other hand, if the best technology to deliver learning tasks is a custom platform, or one that is rarely used by typical students, significant time will need to be devoted to introductory training in how the system works and how they are to use it. This is known as “induction training.” If the induction training for an unfamiliar app is inadequate, the students may feel lost and helpless, decreasing their motivation. Therefore, we must plan for both the initial training of how the system works and is used for class and also for the scaffolding that students will need to assure themselves of their understanding at early stages of using the technology.

Student Use Patterns. A third criterion to consider is how the students will use the technology. It may be mobile technology, such as on a smartphone, or a desktop computer system at home or in a computer lab. Maybe students will be assigned to create a video, instead of a classroom presentation.

In each case, consider whether the intended use matches with the daily lives of the students. For example, research has shown that students sometimes consider use of their smartphones for class as an intrusion on their privacy and that students often have the expectation or unwritten rule that their mobile phones are for social and leisure purposes (Chwo et al. 2016). On the other hand, students often see use of smartphones as a fashion statement. Which model they have, and which apps they use, often conveys social status. Similarly, excelling in game apps used for learning could become a prestige factor in the class, which could be a positive element.

Even more important is the question of *how* the students will use the technology. Several studies have concluded that students often use their mobile technology in ways that are different from what their teachers and technology designers anticipate (Nah 2011; Petersen et al. 2013; Stockwell and Hubbard 2013; Ushioda 2013). The

findings show that when they have brief moments of leisure, or are bored, young people make quick checks of their text messages, chat apps, or Facebook; or Google bus schedules or other needed information, etc. The reality is that students are unlikely to use their brief moments of smartphone access for learning, even though they have learning apps on their phones that are designed to use in brief sessions. Furthermore, the same research shows that students expect to set aside scheduled times for learning tasks, including their mobile technology learning.

This shows that smartphone tasks may work better when they can be performed repeatedly in short bits of time, such as drill and repetition. On the other hand, technology that will be used at desktop computers at scheduled times may be better for longer tasks requiring more concentration, such as introduction of new knowledge.

It is necessary to create an overall instructional design that motivates learners, regardless of their proficiency level. For low-proficiency students, this means tasks via technology that are only a little bit harder than their proficiency level (Krashen 1988, 2003; Vygotsky 1978). For more advanced learners, it means tasks that are not perceived as too easy. Easy tasks could mean that the time spent is not valued by the students. Remember that the key benefit of using carefully selected technology is the motivation of the students.

In order to fit the lifestyles of all students, technology should ideally also be usable from desktop computers, smartphones, tablet computers, etc. This means that it needs versions that work via Windows, iOS, Android, etc.

Task and Technology Mix. The outcome of this process is that the teacher will be able to create a curriculum map that shows measurable outcome objectives, the learning activities designed to accomplish those objectives, and tasks that will make up those learning activities. Figure 2 presents a hypothetical example.

Note that *every learning activity* in the figure has at least some technology involved. Some are as simple as PowerPoint slides. Some use authentic source materials from the Internet. Some require extensive hands-on activity from the students. In this way, students are using multiple forms of technology, each of which is natural and fits well with the lifestyle of university students, making it a rich environment of technology.

Again, good teachers always use a structure similar to this, although it may not be documented in writing. This represents the next step beyond “what are we going to find for the students do this semester” to a kind of planning that is more based on strategies and outcomes.

Novelty vs. Sustainability. The academic literature is clear that use of technology that is short and not repeated can produce different results from technology use that is employed long term. In the short term, learners may actually do better because the technology is new and interesting, but as time passes, the use of technology becomes routine and ordinary and the students do not feel as interested.

When students perform better because of new experiences, it is called the “novelty effect” or the “Hawthorne effect” (Noland 1959). Clark and Sugrue (1995) determined that it requires eight weeks for the novelty factor to drop to a minimal level. For researchers, this means that experimental use of instructional

Outcome Objectives →	Learning Activities →	Tasks and Technology
Demonstrate an awareness of and sensitivity to verbal and non-verbal behavior appropriate for students and instructors	Presentations with class feedback on verbal and non-verbal behaviors	In-class presentations using PPT, with rubric for classmate feedback on verbal and non-verbal behavior
Show critical thinking ability	Individual writing	Short essays on open-ended topics assigned by teacher and turned in electronically
Articulate clearly organized ideas and supporting evidence	Conversation and oral presentations	Group voice chat via LINE with feedback from classmates
Develop ability to recreate the written thoughts of others through vocal delivery	Presentations showing reading comprehension	Students choose BBC news article (topic of their choice) and summarize to small groups in class
Understanding key terminology	Teacher-guided definitions	Lecture with PPT with classroom discussion
Problem Solving	Case study and scenario discussion	Online learning community discussion, guided by teacher
Develop a sense of the cultural aspects of the peoples who speak the target language	Guest speakers; in-class games	Native speaker classroom guests "Live" or via Skype with Q&A; Game-based assessment via <i>Kahoot</i>
Use vocabulary appropriate to the target audience	Dictionaries & resource books; Drill & repetition	Gamified smart phone app developed by university

Fig. 2 Sample educational objectives, activities, tasks, and technology. (Adapted from Marek and Wu 2016)

technology needs to last for eight weeks or more. It means that “sustainable” technology that is designed with the intent of long-term use is likely to be better for the students (Chwo et al. 2016; Levy 1997).

There is a completely different perspective to also consider in instructional design. If students perform best when their technology tasks feel “fresh,” then we should arrange our schedule so that students never feel bored with the technology tasks.

Imagine doing four categories of things with technology in a class. The first has 6 individual learning tasks during the semester, the second has 3, the third has 15, and the fourth has only 2 tasks. That is a total of 26 tasks using technology. Maybe we should assign all six tasks in the first category close together, then move on to the three tasks in the second category, etc., or maybe it is better for those six tasks to be spread out every 2–3 weeks, alternating with tasks from other categories. We must decide based on our own circumstances.

In scheduling learning tasks, the teacher must balance the motivation resulting from the novelty of doing fresh new things with the benefits of extended regular

repetition of the task. How complicated the categories of technology are to learn may affect decisions about how to mix the categories together. There is no perfect answer, but understanding the students and understanding the technology in detail will help determine what is best.

Lesson Plans

When the “big picture” planning above is completed, the next step is to create the detailed lesson plan. We must decide how the multiple learning activities will be scheduled on a weekly or daily basis throughout the semester, on what class meeting will give each specific assignment be made to students, on what days will they be due, what will happen in each individual classroom meeting, and similar questions. This is a standard thing that teachers always do, but the inclusion of more technology in the class may require more detail.

Remember that tasks performed via technology should be part of the lesson plan and the curriculum, rather than a “sideline” or optional tasks, and students should be held accountable for completing their technology-assisted tasks. This echoes Kennedy and Levy (2009) who advocated that when technology is used, it must be “an essential part of the course it is designed for and . . . beneficial to all the students for a sustained period of time, not just an extra option that appeals until the novelty wears off, and is useful to only some of them” (p. 457).

Teaching the Class

The first time any new instructional approach is used, issues may appear that need to be addressed the next time the course is taught. Many teachers feel that they need to teach a course two or three times before the lesson plan and operation of the class is perfected.

When teaching the new technology-rich version of a class, watch for student reactions and for any issues or problems that come up. In some cases, the teacher can address them as soon as they are discovered. In other cases, make notes about things to change next time the course is taught.

It can also be valuable to ask the students directly what they think. Maybe one of the final essays or group discussion topics of the semester could be “what advice do you have for the next time I teach this class?” Some of the answers may not match the instructional philosophy or goals, but the students will likely also have some good ideas.

Evaluating Success

As indicated above, evaluation must be an ongoing process. As soon as the course begins, be watching for anything that needs to be “fine-tuned.” When the semester is over, go back to the measurement plans made when establishing the goals and measurable objectives, before the semester began.

Have you used a technology (in learning or teaching) that was a success or a failure? Describe what happened and why.

What lessons result from these measurements? Think back to what cognitive psychology and constructivism say about how students learn. We can learn things like whether the use of technology helped students be active learners, whether it helped them “connect the dots” between new information and what they already knew, whether it helped them “learn by doing” so that learning was natural, not artificial, whether it helped students feel confident about their learning, and whether they were motivated to learn. The answers to each of these questions will help improve the class next time it is taught.

Thinking About Success. It is not unusual for projects or activities that were not 100% perfectly successful to thought of as “failures.” The truth of even a very successful activity is that while most things worked well, a few things were probably not perfect. In classroom teaching, even when a class is quite successful, there are always things that could be better. There is always room for improvement. If improvements are needed, it simply means that success is incomplete.

NEVER think of anything related to teaching as a “failure.” Always think in terms of “improving the level of success.”

Best Practices

The authors hope that this essay results in reader’s understanding on how to create a technology-rich teaching and learning environment and inspires them to employ a wide range of technology to address a wide range of teaching goals and learning benefits. It is hard to list best practices that apply to every single use of technology, but the following sections address the things that are most important to keep in mind.

Explain the Benefits

We must explain to our students WHY we are using the technology we have selected, and how it will benefit them, with particular focus on convenience and usefulness. We want to promote the perception by our students that their use of technology is helpful to their learning, convenient, and a preferred way of learning, compared to traditional classroom drill and memorization. Without being too academic, the teacher needs to share the insights about the affordances of the technology in clear terms, to show that the learning activities are clearly focused to the goals of the class, rather than simply games or interacting with friends.

Dörnyei (2005) attributed motivation in language learning to students imagining themselves in the future, achieving their future L2 self, and functioning successfully in a cosmopolitan international society. Explaining the benefits of the technology helps demonstrate to the students that they are engaged in learning activities that will be effective in helping them achieve their personal goals.

Select Technology that Students Relate to Well

Remember that many studies using technology for English language learning report problems that could have been prevented by better planning. Every problem decreases student engagement and motivation. If there are too many problems, students will disconnect completely. It is easy to get frustrated or even mad when technology does not work the way it should, and everyone has ideas about how technology “should” work.

When it is said that students must relate well to the technology, it means *both* that it is “user friendly” and easy to use but also that there are no problems with the functioning of the technology system. Computer programs and mobile applications, both pre-existing and those designed especially for our curriculum, should be intuitive, meaning that it is obvious how the system works, without requiring extensive training or tutorials. The system must be free of technical bugs and must function acceptably within the bandwidth and processor chip capability of the devices students will use.

In research, it is common to do a pilot test of a survey questionnaire, to determine any problems. A similar pilot test of planned technology, operated under the same conditions as would be used when implemented for actual English learning, can help uncover hidden flaws. In computer programming, this is called a “beta test.”

Even if we, as teachers, are not very comfortable with the technology initially, we need to work to be an expert user of the proposed technology options. Combined with studying research reports about technology affordances in the academic literature, this will fully allow us to understand the strengths and weaknesses of the systems we are considering.

Make It Part of the Curriculum and Part of the Grade

The overall context of our use of technology for English language teaching should be that it is part of the regular curriculum and lesson plan of our class, performed for a grade so students will be accountable for the work, rather than an optional or “extra credit” activity. As we have seen, short-term uses of technology may produce dramatic results, due to the novelty of the situation (Clark and Sugrue 1995; Noland 1959), but students are less likely to remember what they have learned over the long term, unless the use of technology is a standard component of the class, used repeatedly during the semester.

Remember to use task-based assignments with clear instructions, deadlines, and monitoring by the teacher. In this way, we will activate both the instrumental and integrative motivation of the students (Gardner and Lambert 1972). Integrative “it is a good idea and is worth doing” motivation results from the student’s perception that the technology is engaging and beneficial. Instrumental “I have to do this because it is a requirement” motivation reinforces the willingness to use the system.

In addition, seek out technology that will serve the needs of students as the class is taught again and again, semester after semester. Plan for technology that we can use every time we teach the class for at least five years.

Don't Abandon Your Students to Technology

Too many research studies have thrown participants into a technology system without support from the teacher (Wu and Marek 2016). They were given an assignment to complete and then did not hear from the teacher/researcher again until the deadline grew near. For example, if our technology is chosen to allow interaction in English, an assignment that simply says “talk to each other in the app about this subject and report back in one month” will likely result in student procrastination, superficial remarks, little critical thinking, and a last-minute “hurry up” push to meet the deadline.

Rather, in this example, we should give them a series of progressive discussion tasks with short deadlines that will lead them to the final report. In each case, there should be grade consequences if they do not complete the task by the deadline. We should use scaffolding to initially give them a lot of instructions and feedback, but slowly reduce our level of support as they near their final deadline.

We should place as much emphasis on the “people issues” as we do on the technology itself. Remember that technology is a tool for social interaction and that social environment may include the teacher as well as the students all interacting together. Think about the students’ comfort zones, monitor their work carefully, intervene as needed if they get off track, and give them regular feedback about HOW they are performing their tasks.

Small incremental ongoing deadlines are better than large final deadlines. Give some reasons and examples why.

Give Your Students Encouraging Feedback

As indicated in a previous section, which said that teaching a class is never a “failure” but rather an “incomplete success,” students need positive feedback that will help them achieve greater success, as opposed to negative criticism. Motivation, in large part, is the result of success in a learning task. More success means more motivation, which is why teachers must take care never to give students assignments they consider to be “too hard.”

For example, if a student is making a speech or presenting in class, the teacher/evaluator should highlight the things the student did well. However, rather than saying “you made these mistakes,” corrective comments are better framed in terms of things to work on and do differently next time, thus emphasizing improvement rather than failure. This feedback strategy is based on a beneficial learning orientation versus a less advantageous performance orientation (Bruning et al. 2011).

The feedback we provide, or the feedback programmed into our technology application, should always be encouraging in order to minimize negative feelings and attitudes of students, recognizing accomplishments while highlighting areas needing improvement.

What about a student who really IS failing? The unfortunate answer is that motivation and engagement in learning still happen within the learner. The teacher can only influence them. If the learner is not interested in help or advice from the teacher, the teacher has little influence. The teacher's job is to create an environment and context in which the student can experience success, with each new success building on previous accomplishments. Nevertheless, if the student refuses to be engaged, the teacher can only make the offer of help, and the student must bear the final responsibility.

Final Thoughts About a Technology-Rich Environment

Now that the “how to” elements of incorporating rich technology into the language classroom have been addressed, please take a step back and think about how technology fits in with the overall learning environment. As mentioned near the beginning of this chapter, a learning environment is a complex system. In fact, it has so many variables that it is impossible to control for all of them (Marek and Wu 2014). Some things can be controlled by the teacher, some are more under control of the school, and some are social or cultural and may be beyond our direct control.

The teacher certainly controls the factors making up the instructional environment, such as the lesson plan, assignments, technology, and grading, as has been discussed in detail. The school has the primary responsibility for the physical environment, such as the classroom itself, computer labs, library resources, etc.

But the social and cultural environment plays a much larger part in learning than is often admitted, some of which is part of the instructional environment and some part of the social environment of the student's own life (Marek and Wu 2014). The student's personal social environment includes cultural context, family considerations, peer pressure, job demands, life goals, age, language experience, and procrastination. The institution's environment includes the physical setting, but also things like administrative policies, faculty ability, funding, accreditation, and marketplace expectations.

How does technology fit with these many variables, many of which are outside the ability of the individual teacher to control directly?

First, technology is part of the overall instructional design, which must address student needs and promote desired outcomes, based on sound educational philosophy, and within available resources. This means that the technology will allow students who apply themselves to achieve the established outcome goals. In turn, this means that the technology must serve the needs of the instructional design and be consistent with the overall internal and external context and environment. So, if we have fully made use of the instructional and technology design recommended in this chapter, and made the best theory- and affordance-based decisions at each step, the students can be expected to learn effectively via the technology we have chosen.

Equally important is that technology, if it works well, enhances the student's motivation. It does this by being enjoyable to use and also when students perceive

that the technology is helpful to their learning. If it is useful for their learning, they experience success, which leads to increased confidence. Greater confidence leads to greater motivation, and over time, greater motivation means studying harder and achieving improved ability (Wu et al. 2012).

Overlapping Technology

When technology is richly integrated into the curriculum, it may be that multiple independent technologies are used, each addressing a different function or category of learning tasks. In their real-world nonschool lives, people communicate, interact, and learn via multiple platforms – books, magazines, newspapers (and news websites), television, social media, email, mobile apps, and many other sources of information and interaction. Technology chosen to implement our curriculum and complete learning tasks may need to permit multiple overlapping platforms in order to replicate a natural, organic environment.

These multiple overlapping effective technologies are what creates a technology-rich English language learning environment, but it also means that teachers need to “normalize” the role of technology. This means that technology is used as part of the standard operating procedure of the class, not just as a special stunt. It means that the equipment works well, without bugs or problems (waiting in an audience while someone tries to solve a computer problem is deadly). It also means that technology should be planned to maximize the chances that students can use the technology with ease and in comfort, without problems that interfere with the learning process.

Learning management systems, like Blackboard, Sakai, and Desire2Learn, to name a few, have already learned this lesson about incorporating multiple technology tools and making them easy for students to use. Originally created with desktop users in mind, learning management systems have evolved to be more “mobile-friendly” while pulling together typical functions preferred in learning technology, such as discussion boards, chat rooms, file repositories, daily/weekly lessons, and testing, and providing privacy and security protection that public websites, applications, and social media cannot.

Conclusion

The authors hope that this discussion has been valuable in laying out a road map and rationale for planning and selecting learning technology in a way that is infused broadly across the instructional design. Teachers, individually, need to get to the point in their personal professional development where the infusion of meaningful technology into their classes is automatic as their normal way of teaching.

Learning via technology is not a “gimmick” or something that exists off to the side of the normal instructional interaction. It is a way of thinking and a way of life for the students and therefore should be a way of life for faculty. It is a process of

strategic planning, requiring both research and critical thinking, but the evidence is clear that a technology-rich language learning environment contributes to improved student confidence, motivation, and ability.

Cross-References

- ▶ [Content and Language Integrated Learning in Hong Kong](#)
- ▶ [Creating a Motivating Classroom Environment](#)
- ▶ [Language Learner Engagement: Setting the Scene](#)
- ▶ [Instructed Second Language Acquisition and English Language Teaching: Theory, Research, and Pedagogy](#)
- ▶ [Metacognition and Self-Regulated Learning \(SRL\) in Second/Foreign Language Teaching](#)
- ▶ [Teacher Learning and Technology-Enhanced Teacher Education](#)

References

- Bandura A (1970) Modeling theory: some traditions, trends, and disputes. In: Sahakian W (ed) *Psychology of learning: systems, models, and theories*. Markham, Chicago
- Bruning HR, Schraw JG, Norby MM (2011) *Cognitive psychology and instruction*, 5th edn. Pearson Education, New York
- Candlin C, Murphy D (1987) *Language learning tasks*. Prentice Hall, Englewood Cliffs
- Chwo SMG, Marek MW, Wu WCV (2016) Curriculum integration of MALL in L1/L2 pedagogy: perspectives on research. *Educ Technol Soc* 19(2):340–354. Retrieved from http://www.ifets.info/download_pdf.php?j_id=71&a_id=1720
- Clark R, Sugrue B (1995) Research on instructional media, 1978–1988. In: Anglin GJ (ed) *Instructional technology: past, present, and future*, 2nd edn. Libraries Unlimited, Englewood, pp 348–364
- Dörnyei Z (2005) *The psychology of the language learner: individual differences in second language acquisition*. Lawrence Erlbaum, Mahwah
- Ellis R (2009) Task-based language teaching: sorting out the misunderstandings. *Int J Appl Linguist* 19(3):221–246. <https://doi.org/10.1111/j.1473-4192.2009.00231.x>
- Gardner RC, Lambert WE (1972) *Attitudes and motivation in second-language learning*. Newbury House, Rowley
- Hamari J, Koivisto J, Sarsa H (2014) Does gamification work? – A literature review of empirical studies on gamification. In: *Proceedings of the 47th Hawaii International Conference on System Sciences*, Hawaii, USA, January 6–9, 2014. Retrieved from http://people.uta.fi/~kljuham/2014-hamari_et_al-does_gamification_work.pdf
- Huang Q, Xia H (2010) An effective approach to learning EFL for Chinese students from the perspective of psychodynamics and pedagogy. *Stud Lit Lang* 1(7):32–38
- Hung H-T, Chen C-H, Chao Y-CJ (2017) Lessons learned from Flipping an English classroom for vocabulary and grammar learning with video lectures. In: Colpaert J, Aerts A, Kern R, Kaiser M (eds) *CALL in context. Proceedings of the eighteenth international CALL conference*, University of California Berkeley, 7–9 July 2017. University of Antwerp, Antwerp, pp 330–336
- Kennedy C, Levy M (2009) Sustainability and computer-assisted language learning: factors for success in a context of change. *Computer Assisted Language Learning* 22(5):445–463. <https://doi.org/10.1080/09588220903345218>

- Knowles MS (1980) *The modern practice of adult education: from pedagogy to andragogy*. Association Press, Chicago
- Krashen SD (1988) *Second language acquisition and second language learning*. Prentice-Hall International, Upper Saddle River
- Krashen S (2003) *Explorations in language acquisition and use: the Taipei lectures*. Heinemann, Portsmouth
- Lai C, Gu M (2011) Self-regulated out-of-class language learning with technology. *Computer assisted language learning* 24(4):317–335
- Levy M (1997) *Computer-assisted language learning: Context and conceptualization*. Oxford University Press
- Lee E (2003) Learning through scaffolded assistance during interaction in the EFL classroom: the teacher's role to make an effective learning environment. *J Pan Pac Assoc Appl Linguist* 7(2):189–213
- LoertscherD, Rosenfeld E (2007) *The new taxonomy of educational objectives*, 2nd edn. Teach Libr 34(4):52
- Marek MW, Wu P-HN (2011) Literature as an organic language learning tool. Paper presented at the Sixth (2011) International Conference on Foreign Literature Teaching, Asia University, Taiwan. Available from ERIC database: <http://eric.ed.gov/?id=ED529721>
- Marek MW, Wu W-CV (2014) Environmental factors affecting Computer Assisted Language Learning success: A Complex Dynamic Systems conceptual model. *Comput Assist Lang Learn* 27(6):560–578. <https://doi.org/10.1080/09588221.2013.776969>
- Marek MW, Wu W-CV (2016) Educational engineering for CALL and MALL. In: Leung Y-n (ed) *Epoch making in English language teaching and learning: a special monograph for celebration of ETA-ROC's 25th anniversary*. English Teachers' Association, Republic of China, pp 237–254
- Marek MW, Wu W-CV (2017) Seeking a standard model for CALL. In: Colpaert J, Aerts A, Kern R, Kaiser M (eds) *CALL in context. Proceedings of the Eighteenth International CALL Conference, University of California Berkeley, 7–9 July 2017. University of Antwerp, Antwerp*, pp 496–503. Available from: https://www.researchgate.net/publication/318312149_Seeking_a_Standard_Model_for_CALL
- Merriam-Webster (n.d.). Retrieved from https://www.merriam-webster.com/dictionary/affordance?utm_campaign=sd&utm_medium=serp&utm_source=jsonld
- Myron HB (1949) Activating the passive in language teaching. *Mod Lang J* 33(8):614
- Nah KC (2011) Optimizing the use of wireless application protocol (WAP) sites for listening activities in a Korean English as a foreign language (EFL) context. *Comput Assist Lang Learn* 24(2):103–116
- Noland WE (1959) Hawthorne revisited. *Soc Forces* 37(4):361–364
- Nunan D (1997) Designing and adapting materials to encourage learner autonomy. In: Benson P, Voller P (eds) *Autonomy and independence in language learning*. Longman, London, pp 192–203
- Petersen SA, Procter-Legg E, Cacchione A (2013) Creativity and mobile language learning using LingoBee. *International Journal of Mobile and Blended Learning (IJMBL)*, 5(3):34–51. <https://doi.org/10.4018/jmbl.2013070103>
- Prensky M (2001) Digital natives, digital immigrants part 1. *Horizon* 9(5):1–6
- Sarkar N, Ford W, Manzo C (2017) Engaging digital natives through social learning. *Syst Cybern Inf* 15(2):1–4
- Stockwell G, Hubbard P (2013) Some emerging principles for mobile-assisted language learning. The International Research Foundation for English Language Education, Monterey. Retrieved from <http://www.tirfonline.org/english-in-the-workforce/mobile-assisted-language-learning>
- Ushioda E (2013) Motivation matters in mobile language learning: a brief commentary. *Lang Learn Technol* 17(3):1–5
- Van de Pol J, Volman M, Beishuizen J (2010) Scaffolding in teacher–student interaction: a decade of research. *Educ Psychol Rev* 22(3):271–296

- Vygotsky L (1978) *Mind in society*. Harvard University Press, London
- Wang S-K, Hsu H-Y, Campbell T, Coster DC, Longhurst M (2014) An investigation of middle school science teachers and students use of technology inside and outside of classrooms: considering whether digital natives are more technology savvy than their teachers. *Educ Technol Res Dev* 62(6):637–662
- Wu P-HN, Marek MW (2016) Incorporating LINE Smartphone app affordances: cross-cultural collaboration, willingness to communicate, and language learning. *Int J Comput Assist Lang Learn Teach (IJCALLT)* 6(2):56–73. <https://doi.org/10.4018/IJCALLT.2016040104>. Available from <http://www.igi-global.com/article/incorporating-line-smartphone-affordances/153895>
- Wu W-CV, Marek MW, Yen LL (2012) Promotion of EFL student motivation, confidence, and satisfaction via a learning spiral, peer-scaffolding, and CMC. *Int J Comput Assist Lang Learn Teach* 2(3):55–76. <https://doi.org/10.4018/ijcallt.2012070104>