

# The integration of technology and language instruction to enhance EFL learning

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## Abstract

There is much research in the scholarly literature about using technology to support language learning, and particularly English as a Foreign Language, but the technology is rarely integrated into the curriculum, largely because the research is the product of the pressure on faculty to publish. The author explores curriculum integration, based on Dörnyei (2014) who called for CALL educational programs to employ holistic instructional designs that are based on long-term instructional outcome goals; Colpaert (2012) who suggested that rather than studying the *differences* that result from the use or non-use of a particular technology, researchers should better work to understand the *affordances* provided by the technology to understand the ability that the technology provides to enhance an overall instructional design; and Kennedy and Levy (2009) who spoke disparagingly of what they called “one-off” projects that do not stand the test of time and advocated that technology choices should be long-term projects as opposed to short-term tests, hence the term sustainable design. The author concludes that EFL scholars need a new perspective in which student outcomes are the most important criteria in choosing technology, and that in order to broadly understand the affordances provided by various kind of technology, extensive meta-analysis of past studies is urgently needed. The corollary to this need is that a scholarly culture is needed in which reporting failure is just as important as reporting success because in this way, we help others to learn from the problems arising in our own studies so that they can improve their own research designs and NOT repeat designs that performed inadequately. Conclusions and recommendations are provided.

## Keywords

Curriculum, instructional design, technology, EFL, CALL, affordance, meta-analysis

# **The integration of technology and language instruction to enhance EFL learning**

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The key question I am going to address today is how we can integrate technology with language instruction in order to enhance learning in English as a Foreign Language (EFL). The key word here is “integrate” because the academic literature is filled with studies in which technology is tested on a short term basis and never subsequently made part of the instructional design or curriculum.

What often happens is that a researcher picks a favorite technology or platform. Then the researcher identifies functions that might benefit EFL learning, designs learning activities, and then uses experimental or quasi-experimental methodologies to determine outcomes, often with quantitative surveys and qualitative interviews that address student perceptions.

But many such studies have big problems. The use of technology is often peripheral to the class, students do not understand the value of the use of the technology, students dislike being experimental subjects, the studies often assess only student opinions and not actual outcomes, there are often no control groups, and the researchers do not account for confounding variables.

## **A New Perspective**

The big problem we have in Computer Assisted Language Learning research is that often the researcher is really asking “how can I get a publication so I can get promoted?” But the question we should be asking as professional educators is “how can we help our students learn?” What are the actual skills and abilities students need at the end of the semester? When we know

that, then we can determine what technology can incubate these skills. In fact, leaders in the CALL research field have been speaking out against what they call these “one-off” short term tests (Kennedy & Levy, 2009, page 446).

The perspective I am sharing with you has been inspired Zoltan Dörnyei, of the University of Nottingham, and Jozef Colpaert, editor of the *Computer Assisted Language Learning journal*. Dörnyei (2014) labeled language learning a Complex Dynamic System, a concept in Mathematics in which a system has multiple interconnecting parts, but the whole functions in ways that are not obvious from the nature and operation of the individual parts. Language learning and teaching, therefore, needs to use a holistic approach, doing its best to take into account the wide range of variables that are usually ignored in TELL/CALL studies.

Colpaert (2010, 2012) also concluded that there are so many local factors influencing learning that in spite of rigorous experimental methodologies, it is hard to predict whether a successful CALL implementation at one school will also be successful when replicated at a different school. He said that we should NOT be studying the *differences* resulting from use or non-use of a particular technology, such as results from an experimental/control group research design. He said we should be studying *affordances*, meaning how use of a technology meets the instructional goals of the class or the curriculum. Colpaert said we must first understand needs of the students, then, design the pedagogy holistically, including the technology design as well as other factors. He said that in this approach to planning, the motivation of students is the key to our overall instructional design and our technology choices, but student motivation may not be logical or easy to analyze.

These thought-provoking ideas led my colleague, Vivian Wu, and me to our 2012 *Computer Assisted Language Learning journal* article (Marek & Wu, 2012), in which we

explored these ideas of confounding variables affecting language learning, applying Complex Dynamic Systems theory. We studied the academic literature for reports of factors affecting learning success, added more based on our own experience, and then categorized them into internal and external factors related to the individual and to the school/program. Internal factors included student motivation, age, goals and emotions of the students, their perception of classroom activities, language aptitude and ability, willingness to communicate, learning style, and lifestyle preferences such as social life and dating. External factors included cultural context, attitudes and use of the L2, socio-economic status parental engagement, health of family members, student employment, and school requirements that are unrelated to academics.

This analysis led us to a model in which language learning functions as a living, dynamic environment with many inter-dependent factors which form a figurative “ecology.” Our conclusion was that there are many subtle variables that are rarely addressed in TELL, CALL and CMC research. Researchers, on the contrary, often pick a single variable, such as one particular technological tool, and investigate differences even though there are multiple variables that actually affect learning outcomes, many of which may be invisible to the researcher using traditional experimental designs.

Here is a hypothetical example:

- A grandparent is hospitalized unexpectedly, so...
- Student must be at hospital, so...
- The student has insufficient time to study, so...
- The student gets a low grade on a test, so...
- The student’s motivation drops, so...
- The student’s actual skill falls behind, so...

- The student performs poorly on a standardized English proficiency test, so...
- The student has reduced employment opportunities after graduation.

Each of these steps follows as a logical possibility from the previous one, but there is no practical way that a research study can account for an external factor like this. Because researchers cannot control for all of these variables, the result is that even if a study has 100% perfect statistical analysis of data, the experimental findings may not really be valid, and if they are not, they are not REALLY generalizable. What is a researcher supposed to do?

## **Research Environment**

Researchers in the CALL profession are facing cognitive dissonance, that is, we think in two different ways that disagree. On the one hand, leaders in the CALL field advocate long term technology adoptions, chosen because they do the best job of producing the required student ability outcomes. But on the other hand, most CALL researchers are under heavy pressure to publish in scholarly journals, so they use their students as subjects in year-long, semester-long, or even shorter experimental tests of technology. And that brings us back to our original question, “How do we integrate technology and language instruction to enhance EFL learning?”

Luckily, we have a roadmap we can follow. If we want to really enhance learning, we must plan strategically. That means determining the necessary outcomes, and then working backward to find instructional designs that allow students to achieve those outcomes (Figure 1). This means that the technology choices need to be late in the planning process, chosen to support the overall instructional design.



Figure 1. Instructional technology design process.

We also have a theory-based toolkit that we can use in our instructional design. They include Constructivism with Scaffolding (Bruning, Schraw & Norby, 2011), Communicative Language Theory (Savignon & Wang, 2003), *i + 1* task-based learning (Kennedy & Levy, 2007; Krashen, 1988), and student-centered active learning (Bruning, Schraw & Norby, 2011). To these theoretical concepts, we may now add technology design based on *affordances* to support the overall instructional design and help achieve outcome goals (Colpaert, 2010, 2012; Dörnyei, 2014).

## **Affordances Research**

The logical conclusion, based on this way of looking at instructional technology, is that we need considerably more research that addresses *affordances*. The goals and research questions cannot be focused only on the question of whether using this technology is better than

using no technology at all. The researcher needs to ask, “What benefits does this technology bring to serve my integrated instructional design?” The methods for affordances research may be similar to differences research, but the q are different, NOT “Is this technology better than no technology?” but rather “How does this technology help students achieve EFL program goals?” Table 1 presents a hypothetical example.

Table 1. Hypothetical Affordances-based Instructional and Research Design

<b>Problem</b>	<b>EFL students are reluctant to use English with International visitors.</b>
Outcome Goal	International experiences that will boost confidence
Decision process	FIRST: “What are ALL of the technologies that can achieve the outcome of boosting confidence for using English via international experiences?”  THEN: “Which best fit our specific local environment?” (May use more than one)
Technology Design	International student-to-student interaction via smart phone with weekly tasks to accomplish, with strong teacher scaffolding
Research questions	NOT whether LINE is better than no technology (experimental/statistical) but rather, what functions of LINE result in beneficial experiences and learning (affordances)
Evaluation	Actual tasks accomplished, formative review of student interaction, peer assessment. Note that this multi-model evaluation supports course grades as well as journal publication.
Potential conclusions about affordances	Instant Messaging, easy group collaboration, live calling, sticker communication

The reality of the future of CALL research is that we probably need both *differences* and *affordances* categories of research & analysis. *Differences* research is how we perform basic testing of specific technologies. As a result, it almost always functions as a pilot study. The follow-up, then, can function as *affordances* research, if performed properly, to fully document the ways in which the selected technology can contribute to integrated instructional design.

I characterize *differences* research as generally functioning as a pilot study because it is typically short term – at most a semester long, but often lasting only a few weeks, or even only a

few class meetings. *Affordances* research, on the other hand, is about Sustainable Design (Kennedy & Levy, 2009) that can be integrated into the overall instructional design of the class, and even integrated across the curriculum, with the same technology being used in multiple classes because one class is often not enough to achieve a major difference in educational outcomes.

Worthy technology, selected for sound affordances, may well serve the same outcome needs across many classes in multiple semesters. It should be a strategic program-level decision, therefore, and not just one teacher's choice for a one-shot test, meaning that technology choices may take extensive strategic planning.

## **Urgent Need**

This approach to research, as it informs instructional technology design, leads to another conclusion, that one of the primary needs of instructional technology designers is meta-analysis of the large number individual technologies, the one-off projects. We need to find the commonalities in the factors and capabilities influencing success of the related studies. We also need to understand the factors and capabilities resulting in less-than-satisfactory outcomes.

But that means that our failures must make their way into the academic literature!

We need a scholarly culture in which reporting problem with a research study is just as important as reporting success, because in this way we help others to learn from the problems in our own studies so that they can improve their own research designs and NOT repeat design elements that performed inadequately.

Here is an example having to do with complexity of instructional design. Chen (2012) explored use of the VoiceThread online platform to provide students with peer and expert



audio/video recorded feedback to improve oral performance. The data showed that the learning curve required for students to master using VoiceThread reduced their motivation. We have seen other studies in which there were hints that complexity of technology affected the motivation of students, so meta-analysis would presumably identify similar results in other research. This might lead to an *affordances* best practice that CMC systems which are overly complex or hard to learn can cause stress for students, chilling their motivation to engage with the CMC system, meaning that simplicity, user-friendliness, and ease of training are vital.

Based on the analytical framework above, here are several conclusions and recommendations:

1. Strategic instructional design means long-term decision-making about the best interests of students. Trying something different each semester or academic year, may be needed to identify affordances, but is no more than a necessary evil.
2. All language learning technology design, long-term or short-term, should use Task-Based assignments, designed to give students positive experiences with meaningful language use. This means:
  - a. Carefully planned activities that students/groups must accomplish using technology,
  - b. Tasks require students to meet outcome goals with short-term deadlines, in order to keep them engaged and progressing,
  - c. Students should not be expected to simply “muddling around.” Teachers too often abandon students to the technology and do not monitor their progress, leaving students unsure about what they are supposed to do and how they are supposed to do it. Students facing technology task assignments need strong scaffolding,

meaning that teachers must monitor their work at every step, intervening as needed to keep them on track, particularly in the early phases of the work.

3. The CALL field must come to accept that in the academic literature, the reporting of problems is as valuable as the reporting of victory. Of course, strong theory-based instructional design is still important, but even the best design can still encounter unanticipated problems due to the wide range of hidden variables we cannot control. “Incomplete success” is not “failure” because we can still learn valuable lessons for the future. We only fail if we keep the problems secret.
4. The research timeline of a scholar can be expected to begin with expedient short-term experimentation using available populations. As an academic career progresses, however, the scholar’s research focus should evolve to address a broader, more conceptual perspective. Senior faculty should focus on deep conceptual understanding and strategic instructional design encompassing complete academic programs, and on mentorship of younger scholars.

## **Conclusion**

The final thought I will leave you with is that if we are truly professional educators, the best interests of our students must be of paramount importance. We must, therefore, use an instructional design process in which we determine needed outcomes, plan our learning goals, and THEN select the technology which is best suited to achieve those learning goals. We need to do this, understanding that there are diverse and possibly confounding variables that will be operating with respect to our students and our academic programs. So we must use every meta-analysis resource at our disposal to select the most beneficial technology *affordances*.

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