Online Language Learning in the Workplace: Maximizing Efficiency, Effectiveness, and Time-on-Task

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***Abstract*—Empirical research has established that for online language programs to be successful, they must be tailored to adults' needs, focus on the tasks the learners are expected to accomplish, and be easy to access and use. Despite this, millions of working adults are attempting to improve their English skills using materials that do not meet these criteria. Voxy, an educational technology company offering English as a Second Language (ESL) instruction, has developed an integrated mobile and web-based language learning product based on recent research in Second Language Acquisition (SLA) and online learning, which is designed specifically to maximize adult learners' potential for successful language learning. Recent empirical examples illustrate Voxy's theoretical underpinnings as well as its potential for success as a language learning solution for working adults.**

***Index Terms*—English as a Second Language, Online Language Learning, Task-Based Language Teaching, Computer-Assisted Language Learning.**

I. Introduction

The gold standard for efficient and effective language learning is frequent in-person sessions with a trained professional instructor combined with hours of practice actually reading, listening to, and using the target language. And, ideally, all of this practice would take place in an immersive or simulated immersive setting. Given that those conditions are incredibly costly and logistically difficult, they are outside the realm of possibility for most of the millions of adults currently trying to acquire or improve their English language skills. For this reason, many have turned to online methods of language learning. A quick Internet search for online English instruction reveals hundreds of options, from expensive commercial products to the websites of individual teachers offering word lists for flashcards. However, it is safe to say that while there are many resources available to adult learners in the workplace, very few (if any) have been specially designed to meet the specific needs of these learners.

After a brief review of the literature on online language learning, the discussion will turn to how these empirical findings have informed the theoretical underpinnings of a new language-learning product intended to teach English to adults. Voxy, an educational technology company offering English as a Second Language (ESL) instruction, has developed an integrated, mobile and web-based language-learning system that is motivated by recent research in SLA and online learning. Voxy's comprehensive approach is specifically designed to maximize the efficiency and effectiveness of language learning for adult learners, whether as a program for autonomous learning or a supplement to face-to-face instruction. In addition to illustrations of how the product is designed to facilitate language acquisition, preliminary data supporting its approach will be presented.

II. Technology-Mediated Language Training

A. Language Learning in the Workplace

There has been very little research on the efficacy of adult language learning in the workplace. In 2008, the University of Maryland Center for Advanced Study of Language conducted a large-scale empirical study of adult learners in the workplace using commercially available e-learning materials for language learning (Rosetta Stone and Auralog TELL ME MORE). Participants, all of whom volunteered to use the software at work, were employed by various U.S. government agencies. Despite initial participant enthusiasm and significant researcher involvement and encouragement, the most significant finding from the study was severe abandonment. Of the 120 learners who agreed to use Rosetta Stone, for example, only one learner persisted with the study protocol. Of the 176 participants who used Auralog, there were four participants who completed the entire research study [1].

Those who dropped out of the study gave several reasons for their attrition, including lack of time, technical difficulties, and lack of relevance to their needs. These findings were not surprising given the literature on autonomous language learning and distance language instruction; for online language courses to foster compliance and engagement, they must be tailored to adults' needs, focus on the tasks they are expected to accomplish, and be easy to access and use [2,3,4]. Further, materials and programs for online language learning should be designed using principles of adult SLA (which will be presented in the following section) so that when learners are engaged with the program, their usage results in measurable learning outcomes. Fortunately, there is a wealth of recent research on SLA (both in traditional classrooms and in online settings) with clear findings for program developers.

B. *Second Language Acquisition*

Thirty years of empirical research on language acquisition has established that adults and children do not learn languages the same way, and what comes implicitly to children as they learn their first languages involves a very different process for adults [5]. While the details of the cognitive processes underlying adult SLA are still the subject of empirical investigation—and outside the scope of this paper—it is clear that certain conditions must be met for these processes to take place. Adults need access to significant amounts of *input* in the target language, i.e., written and spoken texts that offer rich examples of language as produced by native speakers [6]. In addition, learners need the chance to produce the language themselves [7,8], as well as opportunities to interact and negotiate with fluent speakers [9,10,11]. In addition, learners require both implicit and explicit feedback on their language performance [12]. Finally, learners need substantial practice in order to build up their language skills [13].

These building blocks for adult SLA—input, interaction, feedback, and practice—have generally been established by way of in-person research in either traditional classrooms or laboratories, but recently there has been significant empirical work on the intersection between SLA theory and computer-assisted language learning [14], which offers several key findings. For example, second language learners benefit the most when the input they receive is tailored to their needs [15], and computer-based instruction is ideal for differentiating instruction and offering learners access to resources that are most relevant to them [2,3]. Further, online input can be elaborated and enhanced with images and glosses so that learners can read and listen to genuine texts while at the same time having the tools they need to understand them [16].

Task-Based Language Teaching – a pedagogical framework for language that has shown promise at fostering interaction through technology – specifies that language instruction be centered on learners' ability to accomplish target tasks driven by their real-world needs rather than on pre-determined linguistic criteria [2]. Early research on tasks and distance learning has demonstrated that learners can improve their global language proficiency by role-playing target tasks with trained language tutors during synchronous online sessions [4] and that computer-based TBLT can drive asynchronous interaction [17]. This is supported by the robust research on computer-mediated communication and language learning, which has established that well-designed communication tasks can foster meaningful interaction that results in language proficiency gains [18].

Feedback on error is necessary for adult language learning, and it works best when presented in a comprehensible way to learners who are developmentally prepared to process it, and when there is a real communicative need for it [19]. The differentiated learning made possible with technology-mediated language instruction facilitates this because learners can be offered instruction based on their own needs and errors. This type of feedback can be automated to some extent with automatic speech recognition and natural language processing [20], though these processes are not yet able to replace a human in terms of their capacity to offer appropriate and robust feedback on error. In general, the type of feedback required by language learners must come from instructors or tutors during synchronous and asynchronous feedback sessions. Early evidence from research in computer-mediated communication indicates that for language learners, one benefit of synchronous, computer-based communication is the opportunity to review their work (as well as the feedback on their errors) offline [21,22].

C. *Synthesis of Best Practices*

As this brief review of the research demonstrates, there are clear best practices for technology-mediated language learning, that, if implemented in a work-place based language training program, would likely lead to effective and efficient language acquisition:

- Offer substantial and varied target language input
- Ensure that learners have tools to assist them with understanding the input
- Ensure that the language learning materials meet learners' needs and interests
- Use synchronous sessions to facilitate task-based interaction
- Offer grammatical feedback and instruction tailored to learners' needs

The common theme emerging here is that instruction, from choice of materials to the focus of grammatical lessons, must be based on learners' needs. The reason for this is two-fold: First, learners are more motivated when they are interested in what they are learning and see a direct relationship between the instruction and their own practical needs, and second, language acquisition is a cognitive process that differs from individual to individual, and a one-size-fits-all approach is unlikely to work for learners at different stages of this process.

III. Practical Implementation and Efficacy

Voxy was developed to offer high-quality language instruction to adult learners, based on the principles of online learning and second language acquisition discussed thus far. The following section explains how each of these principles is put into practice in Voxy's language learning system.

Begin with a needs analysis: All Voxy learners are assessed before they begin using the product as well as throughout their language learning process. They begin with a quick diagnostic exam to get a rough gauge of their proficiency level, and they answer a series of questions to ascertain their interests and language-learning goals. This information is then used to create a custom adaptive course for every learner, tailored to his/her proficiency level, real-world needs, and interests.

Before learners begin working their way through their courses, they are prompted to take a sixty-question proficiency exam to get a fine-grained measure of their

reading and listening proficiency as well as their grammatical competence. They then take a parallel form of this test every three months so that they (and Voxy) can gauge how their proficiency level and needs are changing. In addition, learners are offered ongoing, increasingly granular questions about their language learning goals as they use the product so that their lessons can be tailored specifically to their needs. Finally, learners are able to access a preference page so that they can manually adjust their settings to influence the content of their lessons. For example, learners can choose content based on workplace etiquette, current events, immigrating to the United States, opening bank accounts, preparing for job interviews, studying for standardized tests, and other real-world tasks.

Using all of these data inputs (proficiency level across modalities, task needs, interests, preferences, etc.), Voxy tailors courses to learners' profiles. This makes it particularly suitable for adult learners in the workplace who tend to have had varying prior experience with language learning, a various proficiency levels, and diverse needs and goals. Because ease of access is so important to increasing the time learners spend practicing English, Voxy is accessible from computers, mobile devices and tablets so that learners can work on their English whenever they have time.

Use a wide range of genuine resources. All of the materials in Voxy's customized courses are taken from the real world. For example, learners are offered articles from newspapers and magazines, excerpts from how-to websites, recorded audio conversations of people accomplishing everyday tasks, photo captions, and screenshots of web applications, among others. There are thousands of these resources available in Voxy's archives, all of them tagged so that each resource maps to a taxonomy of learner needs that was developed in-house after extensive research and user-testing.

A frequently cited benefit of distance and technology-mediated language instruction is that learners can have access to the materials that are most relevant to them [2,3]; despite this, most commercial language learning products offer one set of learning materials to all learners. Providing learners with such a wide variety of personalized content ensures that people will read, listen to, and interact with resources that are maximally interesting to them, which not only meets their needs but also increases the likelihood that they will be motivated to engage with them.

In fact, preliminary data from an empirical study Voxy conducted with students at the San Luis Potosí campus of the Instituto Tecnológico de Monterrey in Mexico in 2012 has confirmed that when the same cohort of learners explores Voxy's content, over time, they diversify the resources they access (see Figure 1). During the first week of the study, the learners all completed lessons based on the same twelve resources; however, by the final week of the study, the learners were reading and interacting with 52 unique resources. In other words, although the learners in this study were all in the same cohort, they had different interests, which were reflected in the choices they made about which resources with which to engage.

As the study went on, learners not only increased the number of Voxy resources with which they interacted but also the number of activities they completed on those activities, and there was a significant, positive correlation between the number of activities learners completed during the last week of the study and their English proficiency improvement (as measured by scores on the TOEFL). While more research is needed to confirm these findings, these early data are encouraging, particularly with respect to the use of Voxy in the workplace. Busy adults need to maximize the efficiency

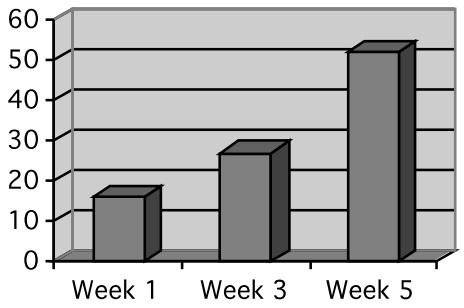

Figure 1. Number of unique resources accessed each week by learners in the same cohort

of their activities, and with Voxy's robust content corpus, they can consume media that they would otherwise be interested in (e.g., breaking news, celebrity interviews, blog posts on cooking, literature) while at the same time practicing their English skills

Adapt lessons in order to individualize instruction. In the discussion of Voxy's first design principle, the topic of differentiated learning was introduced. In order to offer appropriate resources to leaners, language learning programs must do more than simply determine which materials each person should get; the system also needs to select learner-appropriate sequences of activities that draw upon the resources. To meet this challenge, Voxy has designed a series of pedagogic tasks that are mapped to both real-world needs and skill domains, so learners who are, for example, interested in practicing for job interviews are directed to tasks that focus on speaking and listening skills using both job and industry-specific content, whereas learners who are preparing for University-level entrance exams are offered academic texts with tasks designed to mimic the conditions of standardized tests. The combination of resources and pedagogic tasks is dynamically combined and generated based on each learner's Voxy profile so that two learners interested in financial reports and workplace etiquette will not necessarily complete the same activities.

In fact, the learners might not even have the same resources. Each resource in Voxy's corpus is analyzed using a series of values, such as text length, number of words on the academic word list, tense variation, lexical density, amount of coordination and subordination, and

average length of sentence, among others, and the difficulty of each text is calculated. Text difficulty is then mapped to learner proficiency, and resources are offered to learners at levels that are language abilities.

Finally, in addition to differentiating content and activities based on learners' goals, interests, and proficiency levels, Voxy's activities are also adaptive in terms of complexity constraints. Depending upon how learners are performing, the conditions under which they are asked to complete each of the pedagogic tasks are changed. For example, if learners are consistently completing an audio gap-fill activity when selecting from among three options, the number of distractors is increased. If they begin to perform that task consistently, then the type of distractor is made more difficult. By constantly adapting the system to learners' performance, Voxy is able to keep activities challenging without being overwhelming.

Maximize the benefits of technology with high-quality, in-person instruction. While technology is capable of many things, it is not a panacea, and there is no replacement for a human component in language learning [23,1]. Person-to-person communication is especially necessary for providing learners with interactive communicative practice and for offering feedback on written and spoken error. Voxy's language learning product includes both synchronous and asynchronous tutoring sessions at targeted intervals throughout learners' personalized coursework. Based on the findings from years of research in online language instruction outlined in Section II of this paper, these sessions are designed to be not simply translations of face-to-face courses put online, but integrated sessions that take advantage of the benefits of the interactive instructional medium.

During the synchronous sessions, learners meet with a tutor to complete a pre-arranged private lesson based on the learner's interests and needs. Possible lesson types range from a form-focused discussion based on an analysis of the learner's grammatical performance to a role-play simulation of a job interview or workplace presentation. Prior to the lesson, the learner completes specific preparatory activities, and tutors attend the session having just reviewed the learner's language learning profile so that they understand the learner's goals and interests as well as his or her performance metrics. The session is archived so that the learner can review it after the fact, and during the session the tutor uses interactive tools, such as a shared screen and chat box to illustrate concepts for the learner.

Asynchronous sessions give learners a chance to practice responding to written or spoken prompts in text or in speech so that tutors can offer targeted feedback (either on content or form or pronunciation, depending upon their performance and needs). This feedback is sent to the learners through the Voxy system, and they then have the opportunity to review and revise their work. As with all of Voxy's content and activities, these asynchronous sessions are based on learners' interests and needs. For example, asynchronous activities for learners in a business setting might require learners to write resumes and cover letters, respond to emails from supervisors', or respond to voicemails from salespeople and clients.

In addition to offering learners feedback on error and interactive practice through person-person instruction, these sessions are included because previous research has established that they foster engagement with autonomous learning activities [1,4,23]. Early research with Voxy users has confirmed this: learners who complete Voxy tutoring sessions engage in significantly more language-learning activities than learners who do not participate in tutoring sessions (see Figure 2).

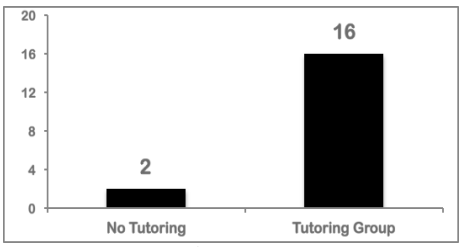

Figure 2. Average number of synchronous activities completed by Voxy users with and without tutoring

IV. CONCLUSION

Drawing on years of research in adult SLA as well as online instruction, Voxy's learning system is based on four key design principles:

- Begin with a needs analysis
- Use a wide-range of resources
- Adapt lessons in order to individualize instruction
- Maximize the benefits of technology with high-quality, in-person instruction

Voxy's comprehensive approach uses real-world content, including topical news stories, authentic conversations, and other audio and text resources, which are presented to learners by way of dynamic, adaptive activities. All of Voxy's content is easy to access and use, and lessons are synchronized across platforms so that learners can begin working on their computers, complete a quick activity on their phones, and then pick up where they left off on their tablets. By offering learners personalized, relevant language learning lessons that they can take with them when they leave the workplace, this novel approach is designed to compensate for the abandonment issues found in other commercially available solutions. While more research is necessary to confirm early findings, preliminary empirical analysis of learner performance with Voxy indicates that these design principles have resulted in a solution that will engage learners with English language resources to maximize their time-on-task and increase the efficiency of their language learning.

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