ABSTRACT
The development of an online corporate training program is a challenge from many standpoints. When the training program involves specialized content and the need for the trainees to meet an international professional standard, the challenges multiply. This case study discusses the development of an online program for international aviation personnel who must meet a newly mandated English language proficiency level. The collaborative effort to design and implement such an Aviation English program has involved two corporations plus a host of subject matter experts (SMEs) in the fields of both aviation and linguistics. In parallel, a program for Business English followed the same developmental path. For each specialized area, a test was written to assess trainees’ English language proficiency and to place them in the appropriate course level. The program design includes a variety of methods of course delivery, from self-paced online instruction to several models of blended learning, which includes classroom instruction to supplement online courses. Blended learning adds the challenge of developing a team of instructors who can be placed in international locations, as well as training on-site corporate instructors when needed. Results of and future plans for assessment of trainee performance as well as overall program effectiveness are also presented.

KEY WORDS
Online courseware design, corporate language training

1. Introduction – The Collaborators
The development of an e-learning program for language training requires a high level of collaboration among people with expertise in a wide variety of fields. This case study summarizes the process, from inception through implementation for Virtual Language Learning Academy (ViLLA), headquartered in Boca Raton, Florida. This company has been developing the course content over the last few years. The original version of the courses was published in WEB-CT to provide web-based instruction. In addition to the small full-time staff, which included graphic designers, audio specialists, and web publishers, ViLLA (originally Virtual Languages, Inc.) used the expertise of a small group of applied linguists to set the pedagogical approach and standards for the entire curriculum and for the individual lesson elements. For the full development of both the Aviation English and Business English courses, ViLLA then pulled together an impressive cadre of materials writers.

The second corporate collaborator for this challenging and multifaceted project is Emerging Business Systems, Inc. (EBS), located in Smithfield, Virginia. Its specialization is the design and development of software and hardware for the creation of training environments that support academic, part-task training, and simulation-based mission rehearsal tailored to military pilots and air traffic controllers. EBS has developed a new learning management system (LMS) for the complete training environment which includes courseware as well as an innovative voice recognition system, specifically to help trainees improve their English pronunciation. The team at EBS includes software engineers, instructor pilot SMEs, and instructional system design experts. The two corporate teams have been under the administrative leadership of a Vice President in charge of content development at ViLLA and a Project Manager at EBS.

On occasion, university collaboration has been elicited. For example, Florida Institute of Technology (Florida Tech) served as the beta test site during course development. Groups of international students took both Aviation English and Business English courses and provided detailed feedback on both the technical aspects (e.g., ease of navigation), individual lesson parts, and overall course value for learning English for Specific Purposes (ESP). Additionally, Aviation English was beta tested at Florida Tech with a group of Chinese civilian airline pilots being trained by Boeing.

Throughout the development process for Aviation English, ViLLA consulted with key aviation organizations such as the International Civil Aviation
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content while they improve their English skills – and a
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requires the interdisciplinary team efforts of many highly
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2. Pedagogical Challenges

Any e-learning program must be designed to facilitate
genuine learning. “Learning strategies should be selected
to motivate learners, facilitate deep processing, build the
whole person, cater for individual differences, promote
meaningful learning, encourage interaction, provide
feedback, facilitate contextual learning, and provide
support during the learning process”[2, p. 3]. We must
remember that, while the technology is important, “the
pedagogical standards must not be compromised” [3, p.
15]; see also [4], [5]. The e-learning program must be
based on solid second language learning pedagogy (see
[6], e.g., [7]). In addition to these elements, especially for
language learning, the cultural element is also an issue.
For example, designers must consider whether Asian
learners cope with e-learning differently (see [8]) from
other groups of learners. It is well known that people use
different learning styles to master material effectively.
Thus, any curriculum must be designed to meet a variety
of learning styles [9]. These and other considerations of
using e-learning for corporate training have been reviewed [10].

Meeting these goals or guidelines is no small task. It
requires the interdisciplinary team efforts of many highly
qualified specialists.

This English language training program was based on a
solid foundation of linguistic theory, especially that
related to English for Specific Purposes (ESP) and second
language education for adult learners, as well as learning
theory, specifically relating to online instruction or e-
learning. ViLLA’s target audience consists of professionals who already know some English but need to
improve their proficiency and fluency. The benefits of
ESP (rather than just general English) include dual-
purpose education – i.e., the trainees learn about relevant
content while they improve their English skills – and a
high level of intrinsic motivation since trainees are
studying subjects in which they are interested. The face
validity of the program (in addition to its overall validity)
also increases motivation because the knowledge is high
stakes for the trainees, especially those in a highly
competitive profession such as commercial aviation or
management (see, e.g., [11], [12], [13] for discussions of
learner attitudes). Flight crews and air traffic controllers
must demonstrate proficiency at ICAO-mandated level by
2008 or face the possibility of losing their jobs or at least
losing the right to fly international routes. In the
corporate world, managers and employees are well aware
that lack of sufficient fluency in English is often a “glass
ceiling” for many junior executives and others. These
facts provide solid extrinsic motivation in both
specialized course areas.

3. Course Development Challenges

ViLLA’s program offers courses at five levels, Basic
through Advanced. Each level is composed of modules of
six lessons each. Members of an extensive course
development team collaborate throughout the process.

To begin the content development process, the Vice
President responsible for content development searches
for an SME to write the reading selection that forms the
foundation of each lesson. For example, Dr. Michael
Witiw, a well-known expert in Aviation Meteorology,
was contracted to write twelve reading selections on that
topic. Dr. T. G. Anderson, (M.D., Flight Surgeon, Ph.D.)
worke the reading selections on Flight Physiology and
Medicine. Dr. Nancy Menelly-Bulkley, an expert on
Customer Service, wrote reading selections on that topic.

The next stage of development involves the assignment of
a team of people who are knowledgeable in ESL training
and who are good materials writers. ViLLA’s ESL
writing team includes approximately 35 free-lance
writers, most of whom have a Ph.D. in Applied
Linguistics, EFL/ESL, or a related area. The ESL team
carefully analyzes the SME’s writing for appropriateness
for the target audience – e.g., for word choice, sentence
structure and complexity, and conceptual difficulty – and
then revises it into the desired language level. After that
is accomplished, the ESL team writes a variety of
activities to stimulate English language development:
vocabulary, listening and reading comprehension,
grammar, and pronunciation activities, all with complete
feedback to provide additional learning opportunities.

An internal review process ensures the quality of each
lesson. Each lesson is reviewed for appropriateness of
level and suitability of activities. In the case of highly
technical material, such as the Aviation English lessons,
the SME also reviews the lesson for technical accuracy.
Finally, a professional editor reviews each lesson before it
is turned over to the web publishing department.

EBS, Inc. has built the LMS for the courseware as well as
innovative voice recognition technology, discussed
below. The publishing division of ViLLA is responsible
for all of the stages of getting the courses put into the
LMS through to having them available online. This
involves the coordination of web developers, software
engineers, audio specialists, and graphic designers.

4. The Aural/Oral Challenge

With any kind of online instruction for language learning,
an effective methodology for teaching solid listening
(aural) and speaking (oral) skills is difficult to implement.
ViLLA has been able to accomplish this through creative
materials writing and through the use of EBS’s voice recognition technology.

To meet the challenge of providing the trainees with practical and realistic listening comprehension activities, the courses give trainees a lot of aural comprehension practice throughout each lesson. Both aviation personnel and businesspeople need to communicate with individuals having different accents, dialects, ages, and voice qualities. Therefore, ViLLA’s courses use a wide variety of native speakers of English (both American and British) for all of the listening elements, including recorded glossary items, reading selection, and all of the listening activities.

All Aviation English lessons include an additional listening element that prepares trainees to handle the radiotelephony that is required for pilots and air traffic controllers (ATC). ViLLA uses a variety of tapes from control towers both in the U.S. and in Europe. Experience with actual pilot/ATC communication is crucial for trainees in the aviation industry. This additional element of the Aviation English lessons requires even more collaboration than that mentioned earlier. ViLLA has worked closely with ICAO, the FAA, and other organizations such as Belgocontrol (the air traffic control authority for Belgium) to produce these very specialized ESP lesson elements.

The aural challenge is easier to meet than the oral one for online courses. EBS, Inc. has provided an innovative solution to solve the most technologically challenging problem: How can trainees get accurate practice with spoken English while working with online courseware? Prior to this design, technology has allowed some recognition; however, until now, it has had minimal success due to its inability to compare the spoken phrase against its stored database of words and grammar rules. EBS had successfully implemented an approach used to train military air controllers for combat actions that require specialized vocabulary and phraseology. This is similar to that which ICAO mandates for its ATC and pilot personnel. EBS leveraged JAVA’s voice recognition technology and years of work with military simulation programs to develop a specialized vocabulary and phraseology set that meets individual lesson objectives rather than a universal vocabulary and grammar set. This voice recognition phonology and phraseology training solution, which provides reliable feedback to trainees when they speak, is part of each course in both Business English and Aviation English.

5. Delivery Methods

Designing the optimal way to deliver training for any program is a challenge. ViLLA has implemented a variety of delivery methods for its online program to afford flexibility for corporations that need to adapt to the scheduling needs of their employees. While the courses can be taken online by individuals at their own pace, delivering the courses within a blended learning environment is highly recommended. This means that some classroom instruction is used to supplement and expand the online lessons. Solid research now exists to support the superiority of using a blended learning model over traditional online delivery (see, e.g., [14], [15]).

One of the resulting challenges of designing blended learning models is the choice of instructors to meet clients’ needs in a wide variety of countries. ViLLA offers a full Trainer of Trainers program to certify its own trainers as well as to help corporate trainers become totally familiar with delivering this specialized English language training program. Since an increasing number of companies are outsourcing their training rather than maintaining their own classroom instructors (Harris 2004), ViLLA’s primary challenge is to gather a large cadre of well-qualified instructors who are willing and able to travel and spend periods of time in other countries.

6. Trainee Assessment

It was essential for ViLLA to develop its own overall assessment exam in each of the specialized areas of instruction for several reasons. First, standardized language exams, such as the TOEFL (Test of English as a Foreign Language) or IELT, are designed primarily for students who are entering university and are therefore based on content appropriate for predicting academic performance. The TOEIC (Test of English for International Communication) is designed to measure English proficiency for on-the-job performance, but does not address the specialized field of aviation. While the mandate from ICAO requires the demonstration of Aviation English proficiency by 2008, there is, at this time, no standardized Aviation English test.

The second reason for ViLLA’s developing its own Aviation English and Business English exams was the need for a placement exam for trainees. As mentioned earlier, ViLLA’s program includes courses at five proficiency levels. When a corporation decides to train a group of employees, it is important to assess their English proficiency and then place them in the appropriate course level. Both of ViLLA’s tests are correlated to its skill levels, so trainees are accurately placed.

The first challenge of developing the Aviation English test was, of course, to write test items that measure clearly differentiated levels of English language proficiency. While many of the trainees who take ViLLA’s Aviation English Exam are already members of a flight crew or air traffic controllers, others are just beginning their aviation education. Therefore, a second challenge was to incorporate aviation content within the exam questions that uses both vocabulary and subject-matter content from the field of aviation without having the trainees’ lack of specialized aviation knowledge interfere with the measure
of language proficiency; i.e., we needed to be sure that the exam measures language proficiency rather than content knowledge. The same issues exist for the Business English exam.

A continuing challenge is the security issue for online testing, one which EBS is working to solve.

6. Program Assessment

All programs must be assessed to determine their effectiveness. Some of the assessment is carried out on the developer’s end while other assessment should be performed at the corporate site where the program is being used. While many corporations do not measure the effectiveness of their online training programs (e.g., [17]), ViLLA encourages the use of a variety of measures to assess the success or failure of a training program.

The use of Kirkpatrick’s Four Levels of Evaluation [18] provides a good foundation for assessment (see[18]). These levels are summarized as follows:

Level 1: Reaction. How do learners feel? How do e-learning instructors feel?

Level 2: Learning. What do research studies show about e-learning?

Level 3: Behavior. How does the learning gained through e-learning change employee behavior?

Level 4: Results. How do the results of training affect a company’s bottom line?

An additional level was added by Phillips [20]:

Level 5: ROI. How can productivity and quality improvements as a result of training be converted to monetary values?

ViLLA is able to assess its program through the first two levels while companies must carry out the other levels of assessment internally. Positive feedback has been collected from all learners and instructors who have used the courses, meeting Level 1, Reaction. More importantly, a detailed research study was conducted with a group of Chinese flight students who used ViLLA’s Aviation English course within a blended learning environment. The study found that after the blended learning program (online courses supplemented with classroom instruction), this group of pilots significantly improved their English language scores on ViLLA’s Aviation English exam. In addition to a statistically significant overall score gain of 20%, these pilots had significant increases (from 13% to 26%) on each of the four skill areas tested by this exam – listening, reading, vocabulary, and grammar [11], [16]. A summary of the full study is available on ViLLA’s website at www.villa-esl.com. These results solidly confirm that Level 2, Learning, has been researched and confirmed. Further information on assessing e-learning in corporate training programs is given in [19].

Since the voice recognition technology is newly-developed, assessment of this important component is ongoing. Continuous monitoring and user feedback will aid in the continuous improvement of this element of the online courses as they will for the entire program.

7. Adaptation to new ICAO Standards

While ViLLA has worked with ICAO from early in its program development, the new mandate that pilots and air traffic controllers around the world meet or exceed a set standard of English Language proficiency by March 2008 has required a special level of assessment for its Aviation English program. Materials already developed had to be re-evaluated to confirm that they conformed to ICAO requirements and recommendations for effective skill development. For example, already in line with ICAO recommendations, ViLLA has used subject matter experts, in this case pilots and air traffic controllers, along with linguistic experts to develop the Aviation English lessons. The program uses the approved pedagogical approach of ESP, Aviation English.

The voice-recognition technology has been added to enhance the trainees’ development of the required radiotelephony skills while the remainder of the course elements continue to teach the vocabulary, grammar, and reading needed for the general English foundation. In addition, ViLLA has brought its five English skill levels in line with ICAO’s levels to make it easier for aviation companies to match ViLLA’s training to ICAO’s requirements.

8. Conclusion

ViLLA has identified the many challenges facing the design, development, and implementation of a specialized online English language training program. This case study has discussed how the collaborative efforts of a highly talented interdisciplinary team of content specialists, linguists, web designers, and software developers have met or are addressing these pedagogical, technical, and assessment challenges.

References:


