Interactive Parallel Text as a new mode of computer-assisted language learning

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A new medium

Those who have learned a second language know the great satisfaction of reading and understanding a native foreign language text for the first time. At that moment, the language becomes truly relevant, and the time invested in learning becomes time well spent. The satisfaction of genuine reading comprehension rekindles the learner's motivation, allowing her to hone her skills with free reading even outside the classroom – a key milestone for language educators. However, as the barrier to reading in a foreign language is simply too high, the unfortunate fact is that few students ever reach this milestone.

Interactive Parallel Text (IPT) is a new tablet-based learning medium that helps language learners to overcome this barrier, allowing even lower-level learners to access foreign language texts. Here we introduce the core ideas of this medium as well as a pioneering IPT application for the iPad. **Libera**, designed by the CJK Dictionary Institute (CJKI), is a language learning aid with significant applications as both a teaching supplement and an independent learning tool. In our efforts to explore the vast potential of IPT for foreign language learning, we invite interested educators to help in testing and evaluating this new technology both in and out of the classroom.

Learning through reading

Interactive Parallel Text expands on the idea of traditional parallel text – that is, a source text printed alongside its translation in another language. IPT aims to build upon the older medium's recognized advantages and overcome many of its shortcomings.

Parallel texts are unique among language learning tools in that they allow learners to enjoyably read texts in a foreign language. That is, really *read* – not read and pause every other sentence to flip through a dictionary or grammar book. This is undoubtedly a familiar frustration for many beginner- and intermediate-level learners – the feeling of immense enthusiasm for a new language and a crisp new book, suddenly all but extinguished after a single, hour-long trudge through the book's first page.

With a comfortable native language translation to help in understanding difficult

grammar and vocabulary, parallel texts allow readers to enjoy smooth, uninterrupted reading, which, as Christine Nuttall (1996) notes, creates a positive cycle in which the reader is encouraged to *keep* reading.

A growing body of research shows that this kind of voluntary, sustained reading is an extremely effective method of learning foreign languages. In a 2002 interview, the linguist and educational researcher Stephen Krashen went so far as to say that *free voluntary reading* is "the most powerful tool we have in language education." His Input Hypothesis maintains that learners are able to rapidly absorb a great deal of grammar and vocabulary when they are presented with large amounts of understandable linguistic material, particularly when this material is at a level just above their current ability. (For additional details, see Krashen, 1989.) Parallel text provides just that, putting vast amounts of reading material within the learner's immediate reach.

Clear text-to-text links

While traditional parallel texts have a great deal to be said in their favor, several key problems have in practice limited the medium's use to higher-level learners. Interactive parallel texts are able to provide a fresh approach to overcoming these issues by leveraging the unique capabilities of the tablet platform. Below we will focus on Libera as a concrete example of how IPT technology can be put to practical use.

A major frustration for users of paper-based parallel texts is that, despite the medium's overall ease of use, texts are – at best – aligned only at the sentence level. Furthermore, because of fundamental grammatical differences between languages, even carefully aligned texts often require users to grope for word-to-word or phrase-to-phrase correspondences. Especially for language pairs with markedly different syntax, the text typically leaves readers on their own to puzzle over the finer details.

As a solution to this problem, Libera uses a system of interactive text-to-text links. In order to make these links truly meaningful, each text is carefully broken down into meaning-level units called *segments*, which can be composed of one or multiple words. Whenever a segment is tapped in any one of the texts, the corresponding segments in all other texts are highlighted simultaneously, showing the link.

This segment-level breakdown of the text is especially important when the segment is not continuous; that is, when the words making up a segment are separated within the text. For instance, in the phrase "to pick the crying baby up," tapping any of the words in the segment "to pick ... up" will simultaneously highlight all three words and their equivalents in the other versions of the text. This allows readers to see for themselves that the complete verb is properly "to pick up," and that this is the unit that is translated into the other language. This innovation eliminates

guesswork when text-to-text correspondences are unclear, letting even lower level learners enjoy a smooth reading experience.

Chapter **1** Sentence **3** ▼	▷ + ẫ
Qasim was a rich merchant because he had married the daughter of a rich merchant, and he worked with him in trade.	カシムは金持ちの商人でした。なぜなら彼は金持ちの商人の娘と結婚し、彼と商売をしていたからです。
work 'wɜ˞ːk *verb* 1. 働く、仕事をする 2. 作動する、動く 3. うまくいく、効く W Word Info	kəsiːm wəz ə ˈrɪtʃ ˈmɜ˞ːtʃənt bɪˈkɒz hiː həd ˈmerid ðə ˈdɒtər əv ə ˈrɪtʃ ˈmɜ˞ːtʃənt, ənd hiː ˈwɜ˞ːkt wɪθ ɪm ɪn ˈtreɪd.

A more flexible parallel text

A major issue plaguing traditional parallel text is the challenge of non-Roman scripts. Due to space limitations, printed texts are limited to showing two texts side by side, since a third text (whether placed to the side or interspersed with a second text) often reduces readability. An editor for an Arabic-English parallel text, for example, must first decide whether to use the native script at all: using a romanization allows the parallel text to be used by lower-level readers, but more advanced readers may find this unnecessary. If the editor does choose to use Arabic text, the next question is what type of script to use – whether to use vocalized script (with vowel markings), unvocalized script (without vowel markings) or partially vocalized script. Whatever the editor chooses, she will have to effectively restrict the text for use by students at a specific level.

Libera's solution once again relies on the greater freedom of a digital platform: the reader can comfortably view up to four texts at the same time by using an interface with a flexible number of panels. Each one of these panels contains a version of the text selected by the user. For instance, in the four-panel view, an intermediate student of Arabic might choose to display *all* of the options available to the hapless

editor above, viewing English, vocalized Arabic, unvocalized Arabic, and romanized Arabic at the same time.

Alternatively, the learner could switch to a traditional two-panel view – showing the two texts side by side, like a book – and place vocalized or romanized Arabic next to unvocalized Arabic for practice in reading the more challenging unvocalized text. This scheme allows students to study in the way that best suits their particular needs, allowing a level of intuitive flexibility that is possible only in digital form.

☰ Chapter 1 Sentence 3 ▾	▷ ＋ ã𓏢
Once upon a time, in one of the ancient lands of Persia, there were two brothers.	昔々、古代ペルシャのある国に二人の兄弟がいました。
One of them was called Qasim and the other was called Ali Baba.	[その]一人はカシム、[もう]一人はアリババといいました。
Qasim was a rich merchant because he had married the daughter of a rich merchant, and he worked with him in trade.	カシムは金持ちの商人でした。なぜなら彼は金持ちの商人の娘と結婚し、彼と商売をしていたからです。
He became rich and was happy with his lot, whereas Ali Baba remained very poor, because he had married a woman just as poor as he was.	彼は金持ちになり、その運命で幸福でしたが、アリババは自分とちょうど同じように貧乏な女と結婚した為に、ずっととても貧乏なままでした。
← he worked…in trade	hiː ˈwɜ˞ːkt…ɪn ˈtreɪd　商売をしていた →

Beyond the texts

In addition to the basic features described above, the tablet platform has a great deal of potential for supplemental tools that help readers to fully understand the text. Libera, in particular, includes tools that create a self-sufficient learning environment without the need for outside references. To understand a difficult or subtle word more deeply, for instance, the user can tap the word in question to display an optional dictionary alongside the texts. To further eliminate the need for guesswork, the dictionary is customized to each specific text, marking which one of a word's multiple senses applies to the given context. Additional tools include word bookmarking, explanatory notes on unusual grammar and word usage, collections of

example sentences for each word, and a number of tools specific to each target language. (For learners of Japanese, for instance, a specialized *kanji* dictionary is provided for Chinese characters used in written Japanese.)

In addition to these text-based features, IPT applications have immense multimedia potential. Libera provides native audio recordings of the entire text for practice in both listening and pronunciation. Users can adjust the narration speed and listen along as they read – similar to following along with an audio book – or they can tap individual words to hear their pronunciations. In order to highlight the subtle differences in pronunciation between single words and continuous speech, the app provides separate recordings of individual words and segments. Future IPT applications, in addition, might choose to incorporate video or dictation elements, giving students new ways to sharpen multiple core language skills.

In this way, an IPT application has the potential to be far more than a simple reading app, functioning instead as a self-contained language study environment.

IPT in the classroom

In teaching English to native English speakers, educators are fortunate enough to be able to draw from several centuries of written English to inspire a passion for reading. Unfortunately, foreign language instructors rarely have this luxury: authentic foreign language texts, on their own, are typically too difficult for all but the most advanced students.

Interactive Parallel Text offers an effective way to make foreign language texts easily accessible to a greater number of language students. IPT apps are perhaps most powerful in their ability to motivate: students feel that they can put their language skills to use right away and finally begin to reap the rewards of their studies. For this reason, these applications are most effective when students have ample time to enjoy reading at their own pace.

In this sense, IPT applications are well suited to bridging the gap between classroom and independent learning. Prominent linguist David Nunan (2014) argues that free learning outside the classroom can significantly enhance the effects of guided study. He continues by saying that, indeed, new language learning technology is an ideal way for students to practice language outside of class. IPT, in other words, should ideally augment rather than replace traditional textbook learning and classroom work. Particularly for schools integrating new technology into their curricula, we suggest that readings from IPT applications be used as supplementary exercises or extra credit in order to stimulate students to read independently. With time to enjoy reading the text, students will gain confidence and enthusiasm on their own.

IPT technology is also excellent for those independently embarking on advanced study of a language – that is, for students graduating from a language program or

otherwise beginning self-study. While IPT is not suitable for absolute beginners, it will prove a strong ally for students with foundational knowledge of a language.

A nascent technology

IPT is a new, evolving technology, with Libera as the first example of its kind. While Libera will soon grow to include a range of languages, initial versions are designed for English-speaking learners of Arabic, Japanese, and Chinese as well as Japanese- and Chinese-speaking learners of English.

Creating new content for IPT applications requires careful alignment of words and phrases, currently done entirely by hand. While computational techniques will speed up the task in the long run, the process is fundamentally labor-intensive – an important consideration as this technology continues to develop. As the task becomes increasingly automated, however, additional language pairs and content will quickly become available, enabling students to choose reading topics of greatest interest to them.

In order to continue to improve Libera, CJKI is making it available to Arabic, Japanese, and Chinese language educators who are interested in testing the application, either independently or with students. For those who would like to try working with this new technology, please see the CJKI website at **www.cjk.org/kanji/libera**.

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For more information on our inaugural Libera application, Libera: Arabic for English Speakers, please see **http://www.kanji.org/kanji/libera/libera_ae.htm**.

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Jack Halpern

Jack Halpern (春遍雀來), CEO of **The CJK Dictionary Institute**, is a lexicographer by profession. For sixteen years was engaged in the compilation of the *New Japanese-English Character Dictionary*, and as a research fellow at Showa Women's University (Tokyo), he was editor-in-chief of several kanji dictionaries for learners, which have become standard reference works.

Jack Halpern, who has lived in Japan over 40 years, was born in Germany and has lived in six countries including France, Brazil, Japan and the United States. An avid polyglot who specializes in Japanese and Chinese lexicography, he has studied 15 languages (speaks nine fluently) and has devoted several decades to the study of linguistics and lexicography.

Jack Halpern has published over twenty books and dozens of articles and academic papers, mostly on the Japanese writing system and CJK information processing, has given over 600 public lectures on Japanese language and culture, and has presented several dozen papers at international conferences.

On a lighter note, Jack Halpern loves the sport of unicycling. Founder and long-time president of the International Unicycling Federation, he has promoted the sport worldwide and is a director of the Japan Unicycling Association. Currently, his passion is playing the quena and improving his Chinese, Esperanto and Arabic.

The CJK Dictionary Institute

The CJK Dictionary Institute, Inc. specializes in Chinese, Japanese and Korean lexicography. CJKI is headed by Jack Halpern, editor-in-chief of the New Japanese-English Character Dictionary and various other dictionaries that have become standard reference works for studying Japanese. CJKI is one of the world's prime sources for CJK and Arabic dictionary data, and is contributing to CJK information processing technology with its high-quality lexical resources.

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