Optimal Foreign Language Learning

The Role of Technology

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PURPOSE
To summarize current and potential uses of technology for foreign language learning and teaching, and to identify best practices for technology use.

CONCLUSIONS
The best practices for technology use maximize target language practice outside of the classroom; maximize the efficiency of classroom contact time with the teacher; enable customization, shareability, and reusability of target language content; provide rich target language input and individualized feedback; and motivate and engage students.

RELEVANCE
Effective technology use can enhance foreign language learning and teaching. The recommended best practices offer the potential of improving foreign language learning outcomes and transfer to real-world contexts.

Executive Summary

PURPOSE
In 2002, the Department of Defense mandated higher minimum proficiency scores for military linguists. The Defense Language Institute Foreign Language Center (DLIFLC) responded to this challenge with a number of initiatives, including an increase in the role of technology in language learning and teaching.

DLIFLC is currently integrating new technologies into its learning environment. To facilitate this process, the University of Maryland Center for Advanced Study of Language (CASL) was tasked with reviewing the literature on the use of technology for foreign language learning and teaching, and recommending best practices for technology use. We ultimately reviewed over 200 publications, including both peer-reviewed research articles and descriptions of teaching practices.

CONCLUSIONS
We identified four categories of technologies that are relevant for foreign language education:

- Classroom-based tools, such as course management systems and interactive white boards
- Individual study tools, such as electronic dictionaries, glossed and annotated texts, and computer-assisted pronunciation training
- Network-based social computing tools, such as chat, blogs, wikis, and virtual worlds
- Mobile/portable, network-capable devices, such as tablet PCs and personal media players

We concluded from our review of the literature that technology use has the potential to enhance five primary functionalities of foreign language learning and teaching:

- Organization—Technology can enable learners and teachers to organize learning and instruction outside of the classroom and enable learners to reflect on and take control of their own learning.
- Input—Technology can expand access to a broader range of rich target language input than is available in the classroom or provided by the curriculum, and it creates opportunities to individualize input.
- Output and interaction—Technology creates opportunities for learners to create their own output and to interact synchronously or asynchronously with native speakers and more proficient peers outside of the classroom.
- Feedback—Technology creates opportunities to give and receive individualized, maximally effective feedback.
- Collaboration—Technology can enable collaborative, social learning synchronously or asynchronously outside of the classroom.

Although technology use for education is widespread, scant evidence exists to support its effectiveness for enhancing foreign language learning.
and teaching. The strongest empirical support for the impact of technology on foreign language learning emerged from the research on written chat and computer-assisted pronunciation training; evidence for the effectiveness of other technologies was generally weak or nonexistent. Therefore, we relied on key principles of learning to recommend best practices for technology use.

From the field of second language acquisition, we identified three crucial principles of language learning:

- **Provide rich target language input to learners**
- **Engage learners in interactive tasks using the target language**
- **Provide feedback to learners so that they notice and correct their own target language errors**

Additionally, from the field of cognitive psychology, we identified four crucial principles of learning that facilitate long-term retention of knowledge and transfer to real-world contexts:

- **Test frequently with minimal retrieval cues**
- **Distribute practice across several small sessions rather than in a single large session**
- **Vary the characteristics of learning activities**
- **Introduce difficulty factors that make learning challenging and require students to process information deeply**

The best practices listed in Table 1 exemplify technology uses supported by crucial learning principles and empirical evidence.

### Table 1

<table>
<thead>
<tr>
<th><strong>Best practices for technology use in the classroom</strong></th>
<th><strong>Use technologies such as . . .</strong></th>
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</thead>
<tbody>
<tr>
<td>✓ Maximize target language practice</td>
<td>Written chat, outside of the classroom</td>
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<tr>
<td>✓ Maximize the efficiency of classroom contact time with the teacher</td>
<td>Computer-assisted pronunciation training, outside of the classroom</td>
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<tr>
<td>✓ Enable customization, shareability, reusability, and anytime/anywhere access to target language content and instructional materials</td>
<td>Course management systems, natural language processing tools, and mobile devices</td>
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<tr>
<td>✓ Archive and analyze interaction, learner output, and incorporation of feedback, and to individualize subsequent input and feedback</td>
<td>Intelligent tutoring systems, ePortfolios, and natural language processing tools</td>
</tr>
<tr>
<td>✓ Motivate students and engage them in meaningful target language use</td>
<td>Ad hoc networks and serious games</td>
</tr>
</tbody>
</table>

### RELEVANCE

Technology use can enhance foreign language learning and teaching by providing rich input, individualizing instruction and feedback, maximizing in-class time for interactive learning, and increasing student motivation. The recommended best practices offer the potential of improving foreign language learning outcomes and transfer to real-world contexts. Decision makers implementing technology for learning should consider the following caveats:

- Using technology will not make bad pedagogy good; conversely, the lack of novel technological tools will not necessarily inhibit effective learning.
- Key principles from second language acquisition and cognitive psychology must be integrated into technology use in order to fully optimize its potential for enhancing language learning and teaching.
- Users need appropriate training on how to incorporate and exploit technological tools to facilitate the attainment of learning goals.

### ENDNOTES

1 For a complete list of the reviewed technologies, see section 1 of the technical report.