

Coriander room
12.45-1.10pm

Music technology to enhance foreign language learning

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A multi-language karaoke application (app) called SLIONS (Singing and Listening to Improve Our Natural Speaking) has been developed at the Sound and Music Computing Lab at the National University of Singapore (NUS) with a goal to provide teachers and students with a new tool that is engaging, promotes joyful learning, and is helpful for foreign language learning and mother tongue retention.

Since music is a popular form of entertainment, many of us listen to music every day and some of us enjoy singing or playing music on a regular basis. However, music is more than a source of entertainment. Parents sing nursery rhymes to their young children to help them learn a first language. Similarly, language teachers have long used music to help students improve their pronunciation and increase their vocabulary when learning a foreign language. Research has shown that actively singing in a foreign language helps with vocabulary acquisition (Medina, 1990), pronunciation (Miyake, 2004; Rengifo, 2009), retention, fluency, and cultural appreciation.

Music technologies are rapidly changing how we consume and engage with music. Popular karaoke apps like Smule's Sing!¹ and Tencent's Quanmin K-Ge² provide a platform where millions of individuals can record and share their voices with others (Newlands, 2016; Pandaily, 2017). Our work focuses on leveraging the popularity of karaoke apps with the power of music for foreign language learning.

We have developed a mobile app called SLIONS (Singing and Listening to Improve Our Natural Speaking) Karaoke. Using this multi-language karaoke app, one learns how to improve pronunciation and vocabulary while learning a foreign language through singing. The development of the app follows a comprehensive user-centred design process that is informed by conducting interviews and usability tests with domain experts and users respectively. We use automatic speech recognition (ASR) technology to provide learners with personalised feedback on singing pronunciation which gives them the opportunity to master difficult parts of the song. To target a large range of individuals, the music catalogue includes nursery rhymes for children, popular songs for young adults, and classic hits for adult learners.

¹ <https://www.smule.com/listen/sing-karaoke/8>

² <http://kg.qq.com/>

A one-week study was conducted with NUS English and Chinese language learning students from the Centre for English Language Communication (CELC) and the Centre for Language Studies (CLS) respectively (N=18) which quantitatively proves that our app improves pronunciation and has the potential to improve vocabulary. In addition, the qualitative results show that SLIONS is fun and motivates students to improve their pronunciation through singing in a foreign language.

The user study suggests that SLIONS is easy to use, enjoyable, has educational potential and provides high levels of motivation to learn a new language. The heightened motivation results in improved performance in many aspects of language learning and make SLIONS Karaoke a more effective app. Moreover, many of our design considerations, such as multimodal instructions, feedback and scoring presentation, and music corpus are beneficial for language acquisition through singing. We also received valuable feedback and recommendations to improve SLIONS in future iterations.



Figure 1. The SLIONS Karaoke App: The user first selects his or her native and foreign language (not shown). After selecting the section (e.g., chorus, verse) of a song, the user listens and learns the song through repeated listening (far left). Then the user records a karaoke performance (middle left). Based on the ASR-based word accuracy, feedback is provided to the user in the form of overall score (middle). The user then reviews the scores for each lyric line (middle right) and can select individual lines to practice and master (far right).

This work was the subject of a paper which was recently accepted to the 2018 Association for Computing Machinery (ACM) Multimedia Conference. The paper includes a detailed literature review of the relationship between language learning, active singing, and various music technologies. We also identify a list of design considerations and important features for SLIONS Karaoke. In addition, many of our lab's recent research results on lyric complexity, singing voice intelligibility, and automatic pronunciation evaluation in singing can be used to produce a novel and compelling user experience in future. The paper manuscript is available upon request.

Keywords

Karaoke, foreign language learning, computer-assisted language learning (CALL), music and educational technology, mobile application

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