

Speaking to machines

motivating speaking through oral interaction with intelligent assistants

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Potential impact	medium
Timescale	medium term
Keywords	automatic speech recognition, pronunciation training, practice, feedback

What is it?

Daring to voice new sounds, words, and phrases is an essential part of learning to speak a language. However, getting students, particularly in mono-lingual classes, to try to speak a foreign language can be a significant challenge. Voice interaction assistants, such as *Siri*, *Alexa*, or *Google Assistant*, offer new opportunities to create meaningful, fun tasks for language learning that require accurate spoken production. Designing good tasks requires an understanding of the learning context and needs as well as the interactional opportunities, constraints, and risks associated with any particular technology.

Recent studies suggest that instead of imagining home assistant voice interfaces as conversational, designers should think in terms of single turn request and response dialogues in which the response often serves as a resource that supports some other ongoing activity. For example, asking ‘*Alexa*, how do you spell awkward?’ while writing an essay by hand, or checking a fact (‘Hey Google, what’s the population of London?’) while arguing with another human. People mainly use voice interaction to get things done quickly and easily, to support

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other activities, and for social fun. We explore pedagogic opportunities created by this kind of interaction; speaking **to** machines rather than speaking **with** machines (see [Satar, this volume](#)).

Example

Teachers quickly saw opportunities to use Intelligent Assistants (IA) as classroom assistants and to motivate speaking. Examples include: setting timers and playing background music for activities; as a resource to support daily routines – e.g. finding out about today’s weather in a different part of the world; and asking for spellings, definitions, synonyms, or checking facts to support individual or group work.

Benefits

Students, particularly young learners, often find this kind of interaction motivating and want to try their hand at getting a machine to do something using their voice. What is more, IAs can potentially answer factual questions teachers may not know the answers to, thus supporting students’ curiosity. They can also act as resources to support group work and student-to-student conversations – imagine a device per group, thus potentially freeing up teachers to monitor, listen, and help more.

One way that language teachers can exploit these opportunities for language development is by designing tasks that push students to produce vocabulary or language structures we want them to start to acquire. This might be in the form of written worksheets designed to scaffold groups doing IA assisted research, e.g. find out about and compare two countries with prompts such as, population, climate, typical foods, capital city, etc. Students need to help each other formulate and produce accurate enough questions to get the information they need. Failures can prompt students to reflect on the accuracy of their own and others’ speech, self and peer-correct, try again, and ask teachers and one another for help. Such tasks give students a reason to produce and hear one another speaking the target language and may lead to them speaking it with one another.

Additional benefits of these kinds of activities are that efficient interaction with IAs requires students to listen carefully, as there is no visual feedback, and to think about and respect turn-taking, useful skills to work on in any language learning classroom.

Devices with screens and voice interaction offer different opportunities. For example, students might ask ‘show me a picture of an artichoke’ to support understanding while reading or listening. This not only helps students make multimodal associations but also gives feedback on their pronunciation as the device displays what it ‘thinks’ they said as text. This information can prompt learners to notice errors, self-correct, and/or ask for help. Teachers can also design tasks to help students notice typical sound difficulties e.g. ‘show me a picture of a ship/sheep, cup/cap, lorry/lolly’.

Voice interaction can also be associated with physical changes, such as turning the lights off, thus creating multimodal and memorable associations. A long history of robot-assisted language learning suggests young learners may find speaking a foreign language to a robot much less intimidating than speaking to a human teacher or peer. Also, robots can move in response to speech and, particularly those that can recognise attention and simulate emotions, may encourage learners to make emotional associations with the language they use with possible benefits for meaningfulness and memory. Though this also raises ethical issues and opportunities to engage with these.

Potential issues

Many of the technologies mentioned are designed for individual use in a first language rather than for groups of language learners in educational settings. There are consequent issues and opportunities to resolve these.

Firstly, education systems need devices that comply with data protection regulations. Teachers also need materials that help them and their students discuss the risks and opportunities of voice interaction and agree on appropriate uses. This can lead to useful explorations of what any particular IA is capable

of: Where are the opportunities and limitations? What questions can we ask to test our ideas? Learning to live with Artificial Intelligence (AI) and speak to machines seems likely to be an essential skill for the future.

Secondly, language learners and teachers need tailor-made Voice User Interfaces (VUIs). VUIs that not only support engaging tasks but also cope well with accents, typical classroom interactions (*What does... mean?*, *Could you explain...?*, *Could you say that again?*, etc.), multilingual input (e.g. *How do you say... in...?*), respond using language appropriate to a learner's competence level, and capture data useful for feedback on language. Teachers also need to reassess their roles in such an environment: how best can I use my time in this environment? What do I need to do to help students make the best use of these devices? For example, trying to and failing to communicate with an IA can quickly become frustrating. Teachers need to monitor, help overcome difficulties, and keep the atmosphere one of playful experimentation with new language.

Thirdly, with ethical automated data capture, opportunities to support teachers in assessment and in providing helpful feedback on speaking activities open up. Reversing the human request followed by device response model, one can imagine pairs of students in a class engaging in speaking tasks in response to device requests, e.g. *I'd like you to speak for two minutes about....* It's very hard for a human teacher to monitor many simultaneous conversations in a classroom and students may well not feel they are being listened to and go off task. This situation might be improved by devices capturing what students say and providing transcripts, potentially with automated highlighting of possible errors and suggestions about opportunities to improve vocabulary range. Such information might be used by teachers and/or students to notice opportunities for improvements and provide motivating and helpful feedback.

To support this kind of human-machine collaboration, teachers and learners need to be involved in understanding the opportunities and risks, agreeing on acceptable uses, and designing desirable ways roles might be shared with 'cobot teachers'. This kind of conversation in turn can lead to a useful reassessment of

what makes humans and human communication different to machines and what makes human teachers special.

Looking to the future

Here we have focused on speaking to machines, rather than with machines, and on motivating speaking amongst groups of learners in classroom settings. This is about creating an atmosphere that encourages speaking in the target language and fosters human-to-human activity and conversation. Here technology does not replace teachers but rather acts as a helpful resource.

This is a distinct opportunity to the more conversational and individualised uses of voice interaction in environments like Alelo's Enskill. Opportunities for conversation and freer-speaking practice with AIs are undoubtedly coming (see Google's recent Meena chatbot experiments), though interactions with these may too be exploited for classroom and group learning and help us to focus on and identify what is special and different about speaking with a human.

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