# A ROOM WITH A VUI – VOICE USER INTERFACES IN THE TESOL CLASSROOM

by **David Kent**
Woosong University
Daejon, Republic of Korea
dbkent @ wsu.ac.kr

**Abstract**

Disruptive technologies have seen how students interact with their teachers, how we as teachers now prepare and provide learning, and how we might best incorporate artificial intelligence into the classroom. To this end, the pedagogical affordances offered by the voice-user interface of digital assistants is explored. Instructional strategies supported by examples are then provided, along with means for actioning their use in the classroom and evaluating their appropriateness and viability for enhancing language learning.

**Keywords:** digital assistants; voice-user interface; interaction; speaking

## 1. Introduction

As instructors, we no longer talk about technology replacing teachers, or even teachers who use technology replacing those that do not (John & Wheeler, 2015); instead we expect to be incorporating technologies for learning into our classrooms. This means that as instructors today, we need to be able to competently apply that technology and competently assess and evaluate the suitability and appropriateness of how that technology has met intended teaching and learning objectives, while also understanding all levels of the educational potential behind its use, and assisting learners in being able to identify those elements as well (Fotos & Brown, 2004; Levy and Stockwell, 2006). This is important because teaching in the time of digital language learning sees us not just doing old things in new ways, but it has ushered in a total era of 'newness.' There are new things to do, new ways to think, new methods of managing relationships with others (and AI – artificial intelligence), and new practices in teaching that require us to adopt new skills and new abilities (Jones & Hafner, 2012). These changes have been disruptive, and include how our students interact with us as teachers as well as how we as teachers prepare and provide learning opportunities inside and outside of the classroom, with access and exposure to technology leading to increasingly interactive, social, and multimodal ways of learning (Richards, 2015). For teachers, too, it may lead to changes regarding 'with

whom' we will teach, and how best we might begin to integrate robots and AI-based digital assistants into the classroom as teaching aids, as well as how their value can be harnessed to provide learners with life-long study companions. Exploring this last facet, and presenting practical ways for teachers to take advantage of teaching English with this technology while evaluating the usefulness of the actions and skills available, is the aim of this article.

## 2. Situating digital assistants in the educational context

Similar interactions that digital assistants now provide through a VUI (voice user interface) have long been seen in terms of chatbot use, notably with ELIZA which gives the illusion of understanding by matching user prompts to scripted responses (pattern matching), but it had no built-in framework for the contextualization of events (Weizenbaum, 1966). Since then, there have been many chatbots (Shawar, 2017) created for many different purposes (Fryer, Nakao, & Thompson, 2019) including ALICE and Watson. ALICE (artificial linguistic internet computer entity) is a natural language processing chatbot which relies on heuristic pattern matching rules when receiving human input (Shawar & Atwell, 2015). Watson, developed by IBM, was originally designed to compete on the television show *Jeopardy*! where it went on to beat two of the show's former champions (Sony Pictures Television, 2010), and it has since gone on to be used to help analyze big data. Recently too, messenger bots are being employed to engage people for entertainment purposes or to handle customer inquiries (Baier, Rese & Roglinger, 2018; Facebook Business, 2018). Evidence also suggests that an increasing amount of social media content is being generated by autonomous entities like social bots that interact both with each other and with humans (Varol et al., 2017).

Although Coniam (2014) did find that the accuracy of text-based chatbots for use as conversation practice machines did need improvement before they could be extensively utilized as a language partner, Enge (2018) has since shown that the accuracy of voice-driven digital assistants is increasing year-on-year. So too, as Underwood (2017) highlights, voice interaction technology has advanced more in the last 30 months than in the previous 30 years, with Nordrum (2017) concluding that error rates for voice-recognition systems are now nearly on par with that of humans. In an extensive study which asked 4,952 questions of each digital assistant with a focus on their ability to answer general knowledge questions, Google came out in the lead (Enge, 2018). The study also points out that by and large, erroneous responses from digital assistants occurred as a result of poorly structured or obscure inquiries. It was also found that users were able to identify incorrect responses and were not misled by erroneous answers.

For language learning through, and specifically in the TESOL (teaching English to speakers of other languages) context, chatbot use has been viewed favorably by learners (Fryer & Carpenter, 2006), with Kim (2017) noting that voice-based chatbots were better received and proved to be more effective than text-based ones for providing teaching and learning in a classroom context. It has also long been known that those students who possess low self-confidence in their foreign language abilities do prefer to interact with a chatbot over a human (Fryer, 2006), and that such interaction can provide for learner autonomy (Shawar & Atwell, 2007) and intrinsic motivation for learning (Jia & Chen, 2008).

However, there have also been instances where benefit has been determined to derive from a novelty effect (Fryer et al., 2017), where chatbot interactions have come to confound communication (chatbot-student) by veering off topic, or where instances of miscommunication (student-chatbot) have occurred (Fryer & Nakao, 2009). So too, teacher attitude to chatbot use, as with many activities, has also been seen to impact upon the classroom success of these technologies (Bii, Too, & Mukwa, 2018), or lack thereof, and this would likely transfer over to any use of digital assistants. Increasingly then, factors considered essential for the design of foreign-language learning with such systems need to be taken into consideration when developing interactions with them, keeping in mind that it is not the technology that drives learning but the pedagogy put in place behind the technology that ultimately leads to learning outcomes (Chapelle, 1997).

## 3. Digital Assistant Voice User Interfaces for the teaching of English as a foreign language (EFL)

### 3.1. Pedagogical considerations

While paramount for language learning, conversation practice can often prove difficult to obtain and, if continually attending classes, perhaps expensive to engage in (Fryer, Nakao, & Thompson 2019). Digital assistants can serve as a means of providing this practice, especially if integrated into the teaching and learning context both at home and in the classroom (Underwood, 2018). Speaking to machines, seeing or hearing appropriate responses actioned, also provides learners with a reason to speak that is inherently motivating and meaningful. However, the long-term effect of digital assistants and students' perceptions of digital assistants as language learning companions, along with the usefulness of such devices for language learning, remains largely unexplored. What we do know is that they can provide a means of interaction that lowers the affective filter (Brown, 2014), which can then lead to the promotion of speaking that is not necessarily contrived.

The main challenge present in today's language learning classrooms, as Hsu (2015) points out, is the lack of time available to provide students with input and output opportunities from a stress-free environment. The opportunities that a digital assistant may then afford is the ability to free up class time, allow for more focused and personalized instruction, and provide learners with stress-free opportunities for increased input exposure and output practice in terms of both quality and quantity. Such interaction, particularly one that involves peer collaboration and learner-centered tasks in a classroom-based context, can help establish a safe-speaking environment for students (Dornyei, 2018). In the case of voice interaction, particularly in RALL (robot assisted language learning), students have experienced lower levels of anxiety coupled with an "increased positive attitude toward learning", and "believed they were learning more effectively, which helped them boost their motivation" (Alemi, Meghdari, & Ghazisaedy, 2015, p. 523). Dizon (2017) also recognizes that the voice user interface of digital assistants is useful, particularly when combined with in-class teacher-facilitated interactive practices that rely on the use of "personalized, computer-mediated instruction as an approach to extend the reach of the classroom" (Moussalli & Cardoso, 2016, p. 325).

The significance, then, that this kind of technology affords teachers is that it can be used to provide support for tasks and classroom management while also delivering opportunities that include:

- provision of voice-driven learning from a safe speaking space;
- dialogue-driven interactions requiring multiple as well as singular turn-takings;
- practice opportunities to develop fluency, as well as active (speaking) and passive (listening) skills;
- access to a variety of actions or skills to engage learning (game-based, story-based, drill-based, content-specific action-based interactions);
- one-on-one individualized language learning and language practice support (Winkler & Sollner, 2018);
- instant access to content that is authentic and factual, with such information coming from a known and trusted database.

Working with digital assistants, then, particularly in the language learning classroom, is mainly about creating more meaningful speaking opportunities that are integrated in sensible ways to prepare students to use that language in the future (Underwood, 2017). This is particularly important as our students will now be living with AI as part of their daily lives, and they need to know how to engage critically and actively with these intelligences. This is especially

relevant as 70% of children aged 8-17 are using voice-assisted technologies, predominantly for information searches, but also to ask questions, play music, and to get advice or help (UK Safer Internet Centre, 2018). This also illustrates that there is now no need to memorize facts or figures, as these are all available instantly. However, students do need to know how to assess this information and determine how best to apply it for their needs, for solving problems, for completing specific tasks, or for achieving particular outcomes.

Teachers incorporating digital assistants into the classroom or for use with learners also need to think about what it is that the AI should be doing, and how this changes the role of language facilitation. For example, establishing an environment where students can work in an atmosphere that supports self, partner, and teacher collaboration with the AI, and one that seeks to provide a means of scaffolding and social interaction as they learn (Vygotsky, 1978). Utilization of AI can also assist teachers in identifying student knowledge gaps, particularly when analyzing transcripts of interaction to identify learner needs (e.g., vocabulary improvement, and structure practice), while outside of the classroom, students can use them as language learning companions (e.g., helping them to complete homework, and providing access to additional tutoring or study programs).

### 3.2. Digital Assistant classroom affordances and shortcomings

Keeping the above in mind, digital assistants can be seen to offer several affordances but they also come with several shortcomings that instructors should consider and aim to circumvent when implementing the technology.

Some of the main advantages may include:

1. Natural interaction, with instant real-time responses that can encourage motivation and learner engagement while lowering their affective filter.
2. Authentic content exposure, particularly when asking factual questions or for further information on a given topic, including spelling and vocabulary. This is effective for learning as it provides students with personalized, and as such, more useful, feedback.
3. Active (speaking) and passive (listening) skills development, while also helping students focus upon pronunciation as they communicate their message or intents.
4. Interaction (Chapelle, 2015) that sees students being able to engage in the negotiation of meaning, obtain enhanced input, and direct their attention to linguistic forms.
5. Support for several learning methods and approaches (including game-play).
6. Additional learning pathways for students with various disabilities. This includes those who are visually-impaired or dyslexic, have dysgraphia, or have hearing disabilities if

screen-based digital assistants are employed.

On the other hand, shortcomings might arise from:

1. Frustrations when user commands and questions, or their responses, are continuously misheard or misunderstood (especially if students have speech difficulties). This can be alleviated by the instructor guiding students with appropriate models that can be used, helping students understand why the miscommunication occurred, working with the assistant to have it understand what is trying to be communicated, and helping students to work out how to use language to get the answers that they need. This also allows teachers to focus on getting students to think critically, and to help them develop higher-order thinking skills.
2. Fossilization or stabilization might occur as the assistants can understand sentences and utterances that are not always grammatically correct. This does allow students to continuously engage with the device as they are understood and are able to communicate, and it also provides teachers with the opportunity to provide better models for students to practice when using the device.
3. Privacy concerns might need to be considered as the device can record what is being said and asked of it. This does provide an opportunity to raise e-safety concerns and data protection questions with learners. Checking the transcripts of the device after class can also allow instructors to see how students interact with the assistant, which provides opportunities to analyze student utterances for grammar issues and to see if new vocabulary is being integrated into their language output.
4. Accessibility is important, with internet access needing to be stable and reliable for use with these devices. Otherwise, the device may not function at all or it may have trouble retrieving or playing back content.
5. Inappropriateness may arise with particular students asking questions that are rude or distracting. One way to counter this is to discuss responsibilities such as digital citizenship before using the digital assistants in class, and to inform them that the device is going to know what they have asked it and that others will also hear what they say.
6. Voice recognition may be an issue with a rowdy class or many students speaking at the same time. However, this could help develop turn-taking skills in students.

## 4. Instructional strategies

### 4.1. Incorporating digital assistants into the language classroom

Essentially, there are three main ways that an instructor may wish to integrate the use of digital assistants with learners, and these are

1) for classroom management and teaching aid purposes,
2) for learning purposes,
3) as a personal language companion outside of the classroom for students themselves.

This can be broken down into two broad categories, that of

1) classroom management, and
2) language learning.

Classroom management actions and skills would include teaching aids, timers and reminders, choosing volunteers and team leaders, and the streaming of content; whereas language learning actions and skills would cover answering inquiries, vocabulary, pronunciation, listening and speaking, reading and writing, creating content, games, stories, songs and streaming content, and formative assessment. (See Appendix A for further details).

Importantly though, as with other technologies, the use of a digital assistant with language learners needs to be guided, with the teacher perhaps preparing content or worksheets that can be utilized with the digital assistant in order to promote the learning outcomes desired. It is a good idea to start small, and keep a list of voice commands or actions and skills handy for teacher and student reference, especially the ones that you would like to try, or find yourself and your pupils frequently using. (See Appendix B for examples).

When starting out, it is also important to set guidelines of use for students. Instructors may wish to allow only one student at a time to access the device, and in this way, they can begin to track the kinds of questions or phrases that students are using so that they can record the ones that work (or the ones they would like to provide modeling for). Use of the device in the classroom can also be added to the '*ask 3 before me'* concept, where students need to talk to three peers in order to learn how to solve an issue or problem before going to the teacher. Other specific use cases for digital assistants might also revolve around a lesson on asking *wh*-type questions or ones that involves tongue-twisters. (Appendix C provides lesson plans, teacher notes, and student handouts for using digital assistants in both of these ways).

### 4.2 Evaluating digital assistant actions or skills

As most of the actions/skills that are available for use with digital assistants have not been designed for the TESOL classroom or the English language learner specifically, using an

evaluation rubric is perhaps essential to assess the quality of those that are available. To this end, a technology integration evaluation rubric (TIER) has been developed to assist instructors in determining the potential benefits, or the 'worthwhileness', of employing chosen technologies within their teaching and learning contexts. A rating scale that goes from 1 to 5, with 1 being poor, 2 fair, 3 average, 4 good, and 5 excellent, has been adopted in order to identify those aspects of technology integration that are weak, and those that align well with target objectives. The rubric itself, along with the conceptual model used to develop it, is included in Appendix D, as is a blank template that instructors can utilize to create an individualized TIER.

## 5. Conclusion

Although not new, it is only now that voice-driven interaction with machines is beginning to change the way we use language and, to some extent, the nature of learning itself. Rather than communicating solely human-to-human, we are increasingly communicating human-to-machine and machine-to-human. The rise of this kind of communication also begins to raise questions about the need to embody additional languages within humans as well as robots, and in turn, why we might want or need to learn an additional language.

For now, however, as with any technology, teachers should analyze and evaluate how and why voice-assisted language learning with AI, through the use of digital assistants, is worthwhile before integrating it within the teaching and learning context, and this article provides several means for instructors to do so. It is also important to adapt any technology use to student and curriculum needs, remembering that it is not the technology that drives learning but the pedagogy put in place behind the technology that ultimately leads to learning outcomes (Chapelle, 1997).

With access to instant real-time information (including translation, spelling, diction, and fact-based information), the opportunities that digital assistants and voice-user interfaces afford language learners is well worth exploring. To this end, it is hoped that this article will inspire instructors to continue this conversation in future articles, by illustrating a variety of use-case scenarios for teaching English with this technology, and encouraging researchers to develop empirical studies into the use of digital assistants for teaching English that goes beyond the handful that currently exist (Dizon, 2017; Moussalli & Cardoso, 2016, 2017).

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## Appendix A

This appendix provides a taste of how a digital assistant may be used by teachers and with learners. A complete listing of all *Alexa Skills* and *Google Assistant Actions* is available at their respective websites, and can be reviewed by teachers to see how they may best fit their unique teaching context.

**Classroom Management Examples**

***Teaching Aids****:* asking questions; checking spellings, definitions, antonyms/synonyms, translations; providing special effects (drum rolls before answers, round of applause if correct).

***Choosing volunteer and team leaders****:* random number generation; picking a number between two given numbers; playing heads or tails; playing rock, paper, scissors.

***Streaming content****:* news; weather; white noise; audio; video; podcasts.

**Language Learning Examples**

***Answering inquiries****:* asking fact-based questions. (e.g., to complete tasks like webquests, conducting research for a writing assignment, completing questions assigned by teachers, or obtaining information on vocabulary/themes under study). The Action/Skill *Safari Mixer* could be useful here.

***Vocabulary, pronunciation, and writing*:** asking for spelling, definitions, meanings, synonyms, antonyms, pronunciations, translations, and repeating of words and phrases; controlled practice using the spelling ability to practice hard-to-distinguish sounds (e.g., minimal pairs); for actions or skills, saying 'Tell me a new word' to Google Assistant, or to *Daily Word* on Alexa.

***Listening and speaking****: Ditty* (on Alexa) can help motivate controlled practice of specific structures (e.g., students might say *'Ditty sing: If I were an animal, I'd be a cat*'); games like Simon Says can be played to actively practice listening skills; and for lower levels, challenges such as *'Which group can get all the answers from the digital assistant first?'* might inspire increased language output and input.

***Reading and writing****:* Alexa has access to audio books and can read Kindle content. Google through *Story Speaker* and Alexa through *Invocable* allow for the development of actions and skills that can read back blocks of text that students have previously met during study, with the instructor developing questions for review and ones that move students on to more text and practice with content.

***Creating content****:* Creating a voice-driven app cannot only help students in the reading and writing process. During such a process, they will also need to think critically and creatively about language and communication in terms of how they use language, the questions that they need to ask, questions that they expect someone might ask a digital assistant, and all of the ways that those questions then need answering. Templates that can be used to develop these skills without coding are available from *Actions on Google*, *Alexa Blueprints*, and Google Voice Experiments such as *Story Speaker*.

***Games****:* flash-card and trivia-based games that can be used for review, speaking, listening, vocabulary, or pronunciation practice, along with Jeopardy! style or Twenty Question type games like *Mystery Animal* where the assistant pretends to be an animal and users need to guess what animal it is by asking relevant questions. Questions need to be those that draw a yes or no answer, such as *'Do you have feathers?'*, '*Do you sleep at night?*'. It can be played on Google Home or on the website. An alternative for Alexa is *Twenty Questions* where the digital assistant will attempt to guess the animal, vegetable, mineral, or music-related item that you or a student has chosen.

***Short stories****:* fairy tales and choose-your-own adventure type. Here, students can listen and work their way through the stories with the teacher providing additional activities such as retelling tasks, writing dialogues between two characters, summarizing the story, completing word form charts, and taking notes of unfamiliar vocabulary to later ask the digital assistant about. Composing choose-your-own adventure stories with *Story Speaker* for Google Assistant or *Invocable* for Alexa can see students being presented with a scenario, such as providing tech support for a company and needing to think through a story process where various clients might telephone them with computer problems, to which they need to offer solutions. They could also be given a scenario where they take a short holiday and have to choose between a cheap or expensive hotel, and go on to provide interactions and (mis)adventures that can be experienced while on holiday.

***Songs and streaming content****:* streaming of podcasts, music, karaoke, and white noise; reading of Kindle and playback audio books from Alexa. Here, skills such as *Ditty* can be used to turn spoken phrases into musical ditties matched to popular music with students using sentences from their text or those they have specifically created, with these then being tweetable.

***Formative assessment****:* Accessing transcripts of student interactions with the digital assistant (e.g., if you have set an activity that requires students to use set phrases, vocabulary, and structures with the digital assistant, you would be able to review the transcript of the session, parsing it through such websites as the *Compleat Lexical Tutor* in order to profile the vocabulary and grammar used. This would then allow teachers to identify which students may need to do further work, and what could be covered more extensively in other classes and for review.)

## Appendix B

The following handout can be used by teachers and students as a reference guide to the kind of invocations that can be used for developing language learning both from within and outside of the classroom.

| **Digital Assistant Classroom and Language Learning Invocations*** <br> *There are so many more available that can be found by experimenting with what to ask! | |
|---|---|
| **Classroom Management** | **Command** |
| *Timers* | *'Set a timer for [x] minutes/hours/days',* <br> *'Set [x] minute/hour/day timer'* |
| *Reminders* | *'Set a reminder [for Brad to take his medication]',* <br> *'Set a reminder for [students to change partners/ take an exercise break/etc]'* |
| *Choosing volunteers* | *'Pick a number between two given numbers',* <br> *'Heads or tails', Play rock, paper, scissors'* |

| **Language Learning** | **Command** |
|---|---|
| ***Vocabulary/Phrases*** | |
| *Definitions* | *'Define [word/phrase'], 'What is a [word/phrase]?',* <br> *'What is the definition/meaning of [word/phrase]?'* |
| *Synonyms/Antonyms* | *'What is the synonym/antonym of [word/phrase]?'* |
| *Spelling* | *'How do you spell [word/phrase]?'* |
| *Grammar* | *'What is the plural of [noun]',* <br> *'What is a [word or phrase form/grammar]?',* <br> *'What is the use of [word or phrase form/grammar] in English?'* |
| *Translation* | *'Translate [word/phrase] to [language]',* <br> *'How do I/you say [word/phrase] in [language]?'* |

| ***Speaking*** | |
|---|---|
| *Pronunciation* | *'How do you pronounce [word/spell out word by letter]?'* |

| ***Listening*** | |
|---|---|
| *Books* | *'Read', 'Get audible [book name]', 'Read Kindle [book name]'* |
| *News* | *'What's the latest news?'* |
| *Wikipedia* | *'Wikipedia [topic]'* |
| *White noise* | *'Play [white noise/rain forest sounds/beach noises/etc]'* |
| *Streaming music* | *'Play [artist name/genre of music/song name]'* |
| *Streaming video* | *'Play [artist name/genre of music/song name/movie name/ TV episode name and number] on [Chromecast/Fire TV* |

| | |
|---|---|
| | *Stick]'* |
| *Streaming podcasts* | *'Play [podcast/podcast number]'* |
| *Stories* | *'Tell me [a story/a fairy tale]'* |
| *Facts* | *'Tell me [something interesting]'* |

| **Fun** | **Assistant** | **Action/Skill** |
|---|---|---|
| *Interactive Stories* | Alexa | *Magic Door, My African Safari* |
| | Google | *Magic Door, 'Let's read along with Disney'* |
| *Music* | Alexa | *Ditty, 'Sing a song'* |
| | Google | *Mixlab, 'Sing a song'* |
| *Games* | Alexa | *20 Questions, Simon Says, Spelling Bee, Spelling Master* |
| | Google | *Akinator , Freeze Dance, Mystery Animal, Mystery Sounds, Simon Says* |
| *Jokes* | Alexa/Google | *'Tell me a joke'* |

| **Miscellaneous** | **Command** |
|---|---|
| *Weather* | *What is the temperature?*<br>*What is the weather [for today/for tomorrow/in X]?*<br>*When is the [next full moon]?*<br>*When/what time is [sunrise/sunset]?* |
| *Astronomy* | *How many planets are there?*<br>*What is the closest planet to the sun right now?* |
| *Animal/vehicle noises* | *What noise does an [animal/vehicle] make?* |
| *Math* | *What is the [sum/product/difference/quotient] of [two numbers]?* |
| *Statistics* | *What's the population of [place]?* |
| *Capitals* | *What is the capital of [state/province/country]?* |
| *Celebrities* | *Who is [famous person/celebrity name]?* |
| *Inventors* | *Who invented [item]?*<br>*Who was the inventor of the [item]?* |
| *Health/Anatomy* | *How many [bones does the human body have]?*<br>*What does the [body part] do?* |
| *Hobbies* | *What books did [author] write?*<br>*What is [book title/movie] about?*<br>*What books would you recommend for [me/a x-year-old]?*<br>*What is a good movie to see right now?* |
| *Cooking* | *Find me a recipe for [food].*<br>*How do I make [food]?*<br>*Convert [imperial] to [metric]* |
| *Finance* | *How much is [x currency] in [y currency]?* |

| | |
|---|---|
| | *What is the exchange rate from [x currency] to [y currency]?* |
| *Occupations* | *What does a/an [x] do?*<br>*What is it like to be a/an [occupation]?* |
| *Shopping* | *What time is [x] open until?*<br>*Where can I buy a/an [item]?* |

## Appendix C

This section presents two use-case scenarios for digital assistants in the language learning classroom. The first example implementation is that of using tongue twisters, the second is a lesson plan for the practice of wh-type questions with students.

**Example implementation 1: tongue twisters**

Tongue twisters are often used to help students practice their pronunciation and improve upon their fluency. Google Assistant has access to tongue twisters built in but a Tongue Twister skill will need to be enabled on Alexa.

***Warm-up***. Tongue-twister use is an easy way to provide a lesson warm-up that transitions students into speaking immediately. To begin practicing tongue twisters with students, write some of the more popular ones that would help with your target learners' problem pronunciations on the board. You could also ask students to write up, and speak out, some tongue twisters from their L1. Try them out for yourself in order to help create a connection with students.

***Activity***. The digital assistant can be used here to speak out a tongue twister for the class to engage with under guided practice. Students can also be provided with a tongue twister each (see the example student handout). They could then be asked to read through the list of tongue twisters together with the teacher or with their partner(s). The digital assistant can then be asked for a random number to select a student (perhaps using roll sheet order) who can then read out a tongue twister for everyone to complete for whole-class practice.

***Practice***. The activity can then be extended by placing students into groups, with the following written on the board or provided as a handout.

Get into teams of five and make your own tongue-twister.

For each person:

1. On a piece of paper, write your first name, and pass the paper to the person on your right.
2. Write down something that he/she did, and pass the paper to the person on your right.
3. Write down where he/she did it, and pass the paper to the person on your right.
4. Write down when he/she did it, and pass the paper to the person on your right.
5. Write down the reason why he/she did it, and pass the paper to the person on your right.

This will give each group five tongue twisters. Students might need to see some examples such as:

*David drank a drink in downtown Denpasar at daylight to destress.*

*Noddy needed noodles in Neverland at noon to nibble on.*

Tell students that they can ask questions to the digital assistant to help them create their tongue-twisters. These might include:

*What are some actions that begin with the letter […]?*

*What are place names that begin with the letter […]?*

*What are emotions that begin with the letter […]?*

***Further practice***. As either a test, or for those students who complete the writing of their individual tongue twisters early, the digital assistant can be used to repeat the tongue twisters that students are saying. It can also be used by them to see if they are pronouncing the sentences adequately. Additionally, they can ask the digital assistant to speak additional tongue twisters for them to practice.

***Example student handout for use with tongue twister practice and the use of a digital assistant***

**Tongue Twisters!**

***Warm-up***

Tongue twisters are tricky, but they can help us practice pronunciation.

What is a tongue twister from your language?

_____

_____

***Activity***

Let's ask our digital assistant for a tongue twister: '*Hey, Google/Alexa. Tell me a tongue twister.*'

Practice speaking it aloud, and write it out here:

_____

_____

Here are some tongue twisters. Try speaking them aloud now with your teacher and your partner(s).

- *Fuzzy Wuzzy was a bear. Fuzzy Wuzzy had no hair. Fuzzy Wuzzy wasn't fuzzy, was he?*
- *How many cookies could a good cook cook, if a good cook could cook cookies?*
- *I saw a kitten eating chicken in the kitchen.*
- *I scream, you scream, we all scream for ice cream.*
- *If a dog chews shoes, whose shoes does he choose?*
- *Four fine fresh fish for free.*
- *Fred fed Ted bread, and Ted fed Fred bread.*
- *She sells seashells by the seashore.*

***Practice***

Get into teams of five, and make your own tongue twisters.

For each person:

1. On a piece of paper, write your first name, and pass the paper to the person on your right.
2. Write down something that he/she did, and pass the paper to the person on your right.
3. Write down where he/she did it, and pass the paper to the person on your right.
4. Write down when he/she did it, and pass the paper to the person on your right.
5. Write down the reason why he/she did it, and pass the paper to the person on your right.

This will give your group five tongue twisters.

For example,

- *David drank a drink in downtown Denpasar at daylight to destress.*
- *Noddy needed noodles in Neverland at noon to nibble on.*

You might need to ask the digital assistant to help you create your tongue twister.

Ask questions like:

- *What are some actions that begin with the letter […]?*
- *What are place names that begin with the letter […]?*
- *What are emotions that begin with the letter […]?*

**Example implementation 2: wh-type questions**

| **Lesson plan guide for digital assistant use when practicing wh-type questions with students** | |
|---|---|
| **Teaching context** | |
| **Level of proficiency** | Beginner to advanced. |
| **Level of maturity** | Adaptable for use with young learners through to adults. |
| **Lesson length** | One lesson (at some point during the week or term).<br>Time allotted for the activity: 50 minutes.<br>Homework completion components (if required). |
| **Lesson topic** | Wh-type question practice, and answer word order. |
| **Objectives** | 1. Understand and use wh-type question words (e.g., What? Where? Who? When? Why? How?)<br>2. Generate authentic wh-type questions to use in a real-world context.<br>3. Understand the appropriate word order for answering wh-type questions. |
| **Outcomes** | 1. Students will show evidence of the ability to use the structure of wh-type questions correctly.<br>2. Students will show evidence of the ability to respond to wh-type questions using appropriate word order.<br>3. Students will speak with a digital assistant to get answers to the questions that they have developed. |
| **Relevant prior learning** | None, although students could have been introduced to the grammar and the use of wh-type questions previously, in which case the lesson can serve as a solidification and review. |
| **Teacher preparation** | |
| **Hardware** | A specific digital assistant device (e.g., Amazon Echo, Google Home); or a computer, smartphone, tablet with a microphone and a digital assistant running on the platform.<br>Stable internet access. |
| **Software** | Digital assistant built-in actions and skills |
| **Webpage links** | YouTube videos practicing wh-question-type use. |
| **Additional resources** | Handout for student reference to work on during class and/or for homework. |

| **Procedure – Day 1 of 1** | | | |
|---|---|---|---|
| **Stage and timing** | **Objective** | **Teacher** | **Students** |
| **Review stage**<br>**(10 minutes)** | Remind students of the type of wh-type questions that exist. Provide a word order with examples. | Teacher writes wh-type question words on the board (e.g., What?, When?, Who?, When?, Why?, How?) prompting students after each one is written (e.g., What time is it?). | Students answer the questions that the teacher prompts them to answer using appropriate word order. Responses can be whole-class or individual. (Use the digital assistant to select a random number corresponding to the roll sheet.) |
| **Warm-up stage/**<br>**pre-technology use**<br>**(15 minutes)** | Introduce question words and the reason why each may be asked, and introduce example questions for each. Focus on the grammar, and how to answer each type. | Point out the specific word order required for answering wh-type questions. For example, asking about the subject of a sentence. | Students can practice with a partner, asking and answering various types of questions from the examples provided by the instructor. (Set a timer with the digital assistant in order to know when to transition to the next phase of the lesson). |
| **Main stage (15 minutes)** | Practice writing and asking questions with an accompanying worksheet. | Ensure that students develop at least five questions, each using a different question word, and following appropriate word order. | Students ask the digital assistant to answer their five questions, writing down the answers that they hear. |
| **Lesson summation stage/**<br>**post-technology activities**<br>**(10 minutes)** | Students should be reminded of the lesson's goals. They should be able to practice asking and answering with various question words, and be able to understand the appropriate word order to achieve this. | Remind students of what they should have achieved, and ask them to practice asking questions to the digital assistant and writing down the answers. | Students should have completed the associated worksheet (see the section *Example student handout*), writing down five questions to ask the digital assistant, and the answers that they heard. This could also be assigned for homework. |

| **Further considerations** | |
|---|---|
| **Follow-up activities** | Students can ask their questions to partners to see if their partners' answers match those of the digital assistant. While pairs are waiting to speak to the digital assistant, they can ask their partners the questions that they created. This can help to develop listening-comprehension skills as well as help students to critically reflect upon the answers that they receive. |
| **Contingency plan(s)** | The entire lesson can be used with the digital assistant component swapped out for peers or the teachers (or for parents, siblings, or friends if being used in a homework scenario). Alternatively, the next lesson in the course syllabus could be ready for use in case there is a problem. Additionally, some short time-filler activities, like language games, can be prepared to fill in the time if technological problems occur. Several activity sheets, for review of previous material, could also be on hand to allow those students who complete the activities early to keep busy with language content. |
| **Evaluation** | What are the biggest frustrations for implementation?<br>Can these be remedied next time?<br>What are the successes of the lesson?<br>What did students get out of this activity?<br>Can more language practice be provided? |

***Example student handout for wh-type question word use and practice when using a digital assistant***

| **Practicing Wh-type Question Words** | | |
|---|---|---|
| **TO ASK** | | |
| ***Question Words*** | ***Meaning*** | ***Examples*** |
| Who | Person(s) | Who is he/she/that? He/she/that is MinSu.<br>Who are they? They are MinSu's parents. |
| Who(m) | Object of the verb | Who(m) did you meet? I met the director. |
| Where | Place | Where do you live? In Seoul. |
| Why | Reason | Why do you go to bed early? Because I have to be at work early. |
| When | Time | When do you go to work? At 6 AM. |
| How | Manner | How do you go to work? I go by public transport. |
| What | Object<br>Idea<br>Action | What is it? It's a frog.<br>What are you thinking about? I'm just day dreaming.<br>What do you do? I am a teacher. |
| Which | Choice | Which one do you want? I want the cheap one. |
| Whose | Possession | Whose book is this? It's hers/his/theirs. |
| What kind | Description | What kind of music do you like? I like all kinds of music. |
| What time | Time | What time did you get home? I got home at 9 PM. |
| How many | Quantity (count) | How many students are there? There are five. |
| How much | Amount (non-count)<br>Price | How much time do we have before class ends? Five minutes.<br>How much is the fish? Five dollars. |
| How long | Length<br>Duration | How long is a mile in kilometers? It's almost 1.61 kilometers.<br>How long did you stay in Japan? I stayed overnight. |
| How often | Frequency | How often do you exercise? I exercise every day. |
| How far | Distance | How far away is your school? It's five minutes away by car. |
| How old | Age | How old are you? I'm 18. |
| How come | Reason | How come I didn't see you in class yesterday? I was sick. |

| **TO ANSWER** |
|---|
| To ask about the subject of the sentence add the question word at the beginning. For example,<br>*Sharon* writes great poetry. – *Who* writes great poetry?<br>To ask about any other part of the sentence and there is an auxiliary (helping) verb, put the question word and the auxiliary verb in front of the subject. For example,<br>She can speak *Korean* – *What* can she speak?<br>They are leaving *tomorrow*. – *When* are they leaving?<br>If there is no auxiliary verb and main verb is a form of *be* (*am*, *is*, *are*, *was*, *were*), put the question word and the form of *be* in front of the subject. For example, |

The movie was *interesting*. – *How* was the movie?

If there is no auxiliary verb and the main verb is not a form of *be*, put the question word and a form of *do* (*do*, *does*, *did*) in front of the subject. For example,

They go to *the park* every Sunday. – *Where* do they go every Sunday?

She wakes up *early*. – *When* does she wake up?

He ate *a hamburger*. – *What* did he eat?

**WORD ORDER**

a) General: question word + auxiliary + subject + verb

*Where were you born? – I was born in* _____.

b) Subject questions (with no auxiliary)

*Who sang the song Gangnam Style? –* _____ *sang it.*

*Which team won the 2018 World Cup? –* _____ *won the 2018 World Cup.*

c) Object questions (with *be* as the main verb)

*Who is your favorite singer? – My favorite singer is* _____.

**PRACTICE**

**The kinds of questions to ask the digital assistant**

- *What is the largest city in the world?*
- *What is the smallest country in the world?*
- *What is the tallest building in the world?*
- *Where is the Burj Kalifa?*
- *Which football team won the 2014 World Cup?*
- *How do you spell context?*

**ASK ALEXA/GOOGLE ASSISTANT**

1. Think of five questions to ask the digital assistant.
2. Write down the questions, and then the answers that you hear?
3. While waiting to speak to the digital assistant you can ask your partner your question.
4. Check to see if the answers they give are the same!

| | |
|---|---|
| **Who?** | _____ |
| | _____ |
| Assistant: | _____ |
| | _____ |
| Partner: | _____ |
| | _____ |
| | _____ |
| **What?** | _____ |
| | _____ |
| Assistant: | _____ |
| | _____ |
| Partner: | _____ |
| | _____ |
| | _____ |
| **Where?** | _____ |
| | _____ |
| Assistant: | _____ |
| | _____ |
| Partner: | _____ |
| | _____ |
| | _____ |
| **When?** | _____ |
| | _____ |
| Assistant: | _____ |
| | _____ |
| Partner: | _____ |
| | _____ |
| | _____ |
| **How?** | _____ |
| | _____ |
| Assistant: | _____ |
| | _____ |
| Partner: | _____ |
| | _____ |
| | _____ |

## Appendix D

The following figures provide the Technology Integration Evaluation Rubric, the conceptual model behind the development of the rubric, and a blank template that teachers can use to create their own evaluation rubric for use within their unique teaching context.

| **Technology Integration Evaluation Rubric (TIER)** | | |
|---|---|---|
| **Aspect** | **Criteria** | **Score** |
| ***The technology (hardware or software)*** | Matches with core learning objectives (e.g., developing fluency, increasing listening practice, practicing vocabulary) | 1 2 3 4 5 |
| | Content assists with learner development (e.g., provides communicative fluency, grammar-based activities) | 1 2 3 4 5 |
| | Meshes well with the instructor (e.g., teaching style, classroom management techniques, time for development and incorporation into lesson plans) | 1 2 3 4 5 |
| | Appropriate for use with the target learner (e.g., age, language level, motivation) | 1 2 3 4 5 |
| ***Content*** | Content and software is error-free (e.g., no bugs; no spelling, grammar, or pronunciation errors) | 1 2 3 4 5 |
| | Provides relevant content and topic (e.g., authentic, timeless, up-to-date, holistically useful) | 1 2 3 4 5 |
| | Content can be modified, tailored, or guided for effective use (e.g., add content on demand, rework content to a lesson) | 1 2 3 4 5 |
| | Content is reusable (e.g., with the same students, across classes, across the curriculum) | 1 2 3 4 5 |
| | Content is shareable (e.g., not locked to a single student/class, distributable to other stakeholders) | 1 2 3 4 5 |
| ***Evaluation*** | Instructor use of the technology provides growth (e.g., leads to action research, pedagogical improvement) | 1 2 3 4 5 |
| | Easy to teach others how to apply the technology (e.g., develop a walkthrough) | 1 2 3 4 5 |
| | Variable assessment types (e.g., poll or multiple-choice for either formative or summative use) | 1 2 3 4 5 |
| | Reviewability (e.g., if assessable: grades can be seen, reviewed, and/or resubmitted by students) | 1 2 3 4 5 |
| ***Usability*** | Provides a learning shift (e.g., creates multi-modal learning, meets set standards; provides completion of competency pathways) | 1 2 3 4 5 |
| | Improves on past learning experiences (e.g., easier distribution or revision of content) | 1 2 3 4 5 |
| | Usefulness (e.g., provides formative/summative assessment; can be utilized for revision, homework, skills targeting) | 1 2 3 4 5 |
| | Distinctive, provides something old in a new way (e.g., polls students instantly with anonymity) | 1 2 3 4 5 |

| | | | |
|---|---|---|---|
| | Suitable for | in-class work | 1 2 3 4 5 |
| | | out-of-class work | 1 2 3 4 5 |
| | | individual work pair work | 1 2 3 4 5 |
| | | group work | 1 2 3 4 5 |
| | | with accompanying handouts | 1 2 3 4 5 |
| | | alongside other technologies (phone/website/etc) | |
| ***Resources*** | Community of content (e.g., a range of resources exist that can be adapted or used as-is) | | 1 2 3 4 5 |

*Ratings:* 1 Poor 2 Fair 3 Average 4 Good 5 Excellent

| **Technology Integration Evaluation Rubric – conceptual model** | | | |
|---|---|---|---|
| **Construct** | **Criteria** | **Item** | **Example** |
| ***Site/App*** | *Purpose* | Is the app/site purpose clear? | Aligns with learning objectives presented in activities. |
| | | Is the content in line with the purpose? | Content provides learning (e.g., communicative-based). |
| | *Teacher-fit* | Is the app/site compatible with your teaching style? | Matches the style of the teacher implementing the content. |
| | *Student-fit* | Is the app/site appropriate for use with the target learners? | Matches the style of learners. |
| ***Content*** | *Accuracy* | Is the information correct? | No spelling or grammar errors. |
| | *Currency* | Is the information up-to-date or timeless? | Topics and information from the last five years. |
| | *Adaptability* | Can the technology (or the content that it offers) be tailored to learning? | Applicability (can add content on demand; can rework content to a lesson; can utilize it to complete objectives or projects). |
| | | Can the content be reused? | Suitable across different classes and students in the teaching and learning context; can be designed or modified once and used across classes/students. |
| | | Can the content be shared? | Means to distribute content to all students, between students, to other stakeholders (including students' output), content locked to a single student/class. |
| ***Evaluation*** | *Professional development* | Can instructor use of the app/site be assessed? | Useful for action research, improving teaching skills. |
| | | Am I able to teach others how to employ this effectively | Develop a walkthrough. |
| | *Assessment suitability* | Can the app/site be used for formative/summative assessment? | Provides a range of assessment choices for learners/instructors (e.g. poll, multiple choice). |
| | | Can grades be reviewed/resubmitted? | Allows students to redo work and resubmit before final grading. |
| ***Usability*** | *Significance* | How is the technology important? | Shifts learning (e.g., provides multi-modal learning; meets set standards; provides completion of competency pathways) |
| | *Adds value* | How is using the technology adding value? | Improves on past experience (e.g., easier distribution or revision of content). |
| | *Usefulness* | How is the technology useful to apply? | Means of use (e.g., provides formative/summative assessment; can be |

| | | | |
|---|---|---|---|
| | | | utilized for revision, homework, or skills targeting). |
| | *Uniqueness* | How is the technology providing something special? | Provides something old in a new or unique manner (e.g., polls students with anonymity with instant results) |
| | *Deployment* | How is the technology best utilized? | Context of use (e.g., in- or out-of-class, individual, pair, or group work; smartphone, website, printouts). |
| ***Resources*** | *Existing content* | Does teacher-developed content already exist? | Community of content (e.g., a range of resources exists that can be adapted or used as-is to meet current needs). |
| **Format** | *Checklist* | What scale or means will be used for rating the applicability/value of items? | Likert scale (e.g. questions can be scored from 1 to 5 to get a total percentage for the technology). |

| **Technology Integration Analysis and Evaluation – rubric blank template** | | | |
|---|---|---|---|
| **Construct** | **Criteria** | **Item** | **Example** |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| **Format** | | | |

Complete the template sections as required, adding or deleting rows as appropriate.