

EMERGING TRENDS IN LEARNING TECHNOLOGIES FOR SECOND LANGUAGE LEARNERS IN THE 21ST CENTURY

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ABSTRACT

This paper critically examined the new trends in innovative technology, enabled by Internet technology, that have simplified the learning of a second language autonomously. After a thorough literature review of emerging information and communication technologies (ICT) for learning a second language, attention is paid particularly to

INTRODUCTION

Learning a second language has many benefits that made it very important for everyone, especially in the 21st century when the world is being referred to as a “global village.” Easy communication with native speakers of a language will enhance healthy relationships, promote business transactions, improve intercultural awareness, and help in maintaining political and security interests in such parts of the world. It has also been discovered through research that second language proficiency improves the cognitive ability and problem-solving skills of a language learner (Zhang, 2021). In the 21st century, the use of technology has been generally accepted globally as a result of its tremendous contributions to every aspect of human endeavor. This century is also called the digital age, with a fast and massive production of digital technology to facilitate



Internet-based applications such as language translators, voice-to-text, and text-to-voice applications as powerful tools for learning a second language. The effective ways of using these tools to maximize both cognitive and psychomotor behavioral changes in second language learners were emphasized. The two-way translation method is one of the strategies presented in this paper to ensure accuracy in the interpretation of the new language. The pros and cons of adopting this technology were highlighted. The indispensable roles of learning a second language in the intellectual and socioeconomic development of an individual were discussed, and finally, recommendations were made.

Key words: Emerging Trends, Learning Technologies, Second Language Learner, 21st Century and Artificial Intelligent AI

communication and mass dissemination of information (Haryonoa, Subkhan, & Widhanarto, 2017). Technology has changed our lives, our relationships, and our mode of communication with others by eliminating distance barriers, reducing labor costs, and saving time. Our educational system is not left alone in the transformational role of information technology; learning is now made easy, the door of opportunities to acquire knowledge in different forms is now open, and access to any form of learning material is now available. Nowadays, young students are known as digital natives and use technologies and digital communication as second nature (Carmen & Cueto, 2017). Some of these young people have leveraged technology to learn new languages and new skills without crossing the door of their houses or the border of their countries. It is possible today to learn any language in the world autonomously using several emerging technologies available for learning a second language. Computer-assisted learning, computer-assisted instruction, and so on, were very popular in those days, but now the emergence of Internet technology has moved the world into a new trend of learning (most especially learning a second language). Introduction of Artificial Intelligent into the computing



world has made what seems impossible before men possible. The emphasis is now on mobile-assisted language learning, digital language laboratory systems, and language learning aid applications. In this paper, emerging trends in technology for learning a second language will be critically explored. The primary objective is to unveil emerging technology that is very suitable to be categorized as “language learning aid applications” due to their significant roles in promoting autonomous learning of a second language. The internet-based application that forms the center of attention in this paper is “Language Translator,” while Speech Recognition and Text Reader are seen as supportive applications that are capable of making the dream of learning a new language realistic.

Review of related literatures

Melvina, Lengkanawati, & Wirza, (2021) observed that the use of new technologies in teaching and learning languages promises the emergence of autonomous language learning. It provides students with easy access to a variety of resources, tools, and environments for learning outside the classroom. It also promotes students’ motivation, mental-cognitive self-confidence, and social skills when used to learn a new language outside the classroom (Zhang, 2022).

The invention of the Internet has opened the door to access global learning, communication, entertainment, economics, and health care. Social media sites such as Google, Facebook, YouTube, WhatsApp, Line, Telegram, Instagram, Path, and so on have made intercultural relationships very easy. The technology is growing very fast to meet the communication, learning, shopping, and entertainment needs of 21st-century society. (Haryonoa, Subkhan, & Widhanarto, 2017). Social media technologies like YouTube, Facebook, Instagram, Whatsapp, and so on have been identified by Haryonoa et al. as one of the possible ways of learning a new language by connecting to professional language teachers from different parts of the world to learn any language of one’s choice. In fact, social media is a technology that promotes or encourages learning autonomy.



Thouësny & Bradley (2011) believe that computer-assisted language learning (CALL), and more precisely, technology in CALL, has been widely used to promote learning, assess to learners, and collect data for all kinds of investigations. CALL can be described as a computer application package specifically developed for learning a second language.

According to Shadiev, Wen, Uosaki, and Song (2023), emerging education technologies that will be effective for learning languages include virtual reality, artificial intelligence, augmented reality, mixed reality, robotics, learning analytics tools, and adaptive learning systems. One of the most promising applications of emerging learning technologies is personalized language learning (Hwang, Nurtantyana, Purba, Hariyanti, Indrihapsari & Surjono, 2023). In addition, natural language processing and computer vision can create interactive and engaging learning experiences such as virtual reality simulations and intelligent tutoring systems. These are new technologies that have been proven to be very effective and efficient when adopted and adapted to teaching and learning in the educational system.

In this paper, three emerging internet-based applications emanating from artificial intelligence (AI) form the center of attraction will be discussed in relation to using them for learning a second language. These applications are:

1. Language translator application,
2. Voice recognition (voice-to-text) application and
3. Text Reader (text-to-voice application).

Language Translator Application

Language translation is the process of converting information from one language to another. It is a means of learning a new language. Ogundokun, Awotunde, Misra, Owolabi, Adeniyi, and Jaglan, (2021) opined that before the modern trends in education system can be adequately implemented, translation and language learning tools are needed. Currently there is increase in the number of cell phone applications providing such services to make language learning very easy for humanity. Translation application can be used to facilitate learning since it can be used to practice what has been learned,



diagnose problems, and test proficiency. Other roles that translation applications play in learning new languages include:

- It reveals their structural differences as well as any similarities that the native language may share with the target language, such as vocabulary or word order.
- It helps learners realize how different languages can convey a message in vastly different ways.
- It assists the learner in getting used to switching between native and target languages.
- It enhances both written and spoken skills in the target language.
- It allows learners to relate new knowledge to existing knowledge.

The Language Translator application is a computer program that has the potential to translate the English language to many major languages in the world and translate any of the languages to

English. In Nigeria, for example, Yoruba, Igbo, and Hausa are the three major languages generally recognized. Machine translation can handle the translation of these three languages accurately, like the native speakers of the languages, if the principles and procedures are followed. The same is applicable to other countries in the world, making it very possible and easy to learn any language autonomously. In fact, Harshithaa (2022) describes Translator application as an assistance for translation which helps people survive in places where the language is unknown because somebody can easily input their messages either via text or via speech and can translate it easily into any language.

The idea of machine translation was conceived in the 1950s, but with the rise of deep learning and neural machine translation (NMT), it is presently gaining ground and becoming more reliable than ever. Most machine translations are more accurate when done in the English language. For instance, a Yoruba speaker who shows interest in learning German may gain a more reliable knowledge of German when English is translated to German than when Yoruba is translated directly to German.

There are many examples of language translation applications, which include Google Translate, DeepL, Amazon Translate, and Microsoft Translator.



Google Translate: Google Translate has a lot of input to work with. Google Translate has the highest accuracy for English because most websites and their contents are designed in English. It is the most popularly used machine translation, and it has been proven to be efficient in almost all the major languages of the world.

Microsoft Translator: This language translator is another popular application that supports the translation of more than one hundred languages. It is very effective in German and Portuguese translations.

DeepL uses the same approach to machine translation as Google Translate; it is very effective for translating Italian and Spanish. This application supports many languages but performs best at Spanish translations.

Amazon Translate is ranked as the least-performing machine translation engine. It is very good for translations in French and Chinese. It also supports more than 75 languages (Aguilar, 2023).

Strategies for ensuring accuracy in language translator applications

In a study conducted by Aguilar in 2023, it was discovered that the translation proved to be accurate when enough context was provided. This means that if the translator cannot recognize the context for a particular term, it may use a general translation, which may directly or indirectly affect the meaning of the translation. This is the reason why Budiharjo (2018) concluded that there are still gaps between translations resulting from Google Translate and those that human translators would produce. This paper therefore aims at exposing the language learners to strategies they can adopt to bridge the observed gaps in native speaker translation of a statement and machine translation of the same statement. The following are methods suggested in this paper:

- **Two-way translation:** this is a method by which translation is done, probably from English to a target language and back to English. The argument here is that if there is consistency in the translation (that is, if the learner gets exactly what he or she translated back), it is more likely to have a correct literary translation of such a statement.
- **Two or more translators:** This is another method of ensuring the accuracy of the content translated. It requires more than one language-translator application. For instance, Google Translate can be used to do



the translation first, after which any other program like DeepL and/or Microsoft Translate will be used. If the two programs give exactly the same result, it signifies a high tendency to get an accurate result.

- **Translate a simple and short sentence at a time:** Machine translation can be used as a language dictionary where a particular word can be checked in a particular language. It can also be used to translate phrases or sentences into the target language. A sentence that is short, simple, and sensible will produce a more accurate translation than a long sentence that lacks proper punctuation.

Speech Recognition and Text Reader Applications

A language translator may not be sufficient for learning a new language since language learning requires a minimum of four skills: writing, reading, listening, and speaking. A language translator must be used with two other emerging language learning applications before a new language learner can develop the required skills. These two applications are speech recognition (voice to text) and text reader (text to voice) applications.

Speech Recognition

Speech recognition is also known as a voice-to-Text application. It is a technology that enables the recognition and conversion of a spoken language into text by an Internet-based computer application. Most speech recognition systems use "enrollment," where the user has to read text into the system. The system analyzes the person's specific voice and uses it to fine-tune the recognition of that person's speech, resulting in increased accuracy. Systems that require voice training before the translation can be accurate are called "speaker-dependent," while applications that do not require training are called "speaker-independent" systems. Mardini & Mehta (2006) points out the fact that speech recognitions are designed to conform to people's most natural way of communicating and essentially do not require the user to alter this method of speaking in an attempt to make the system understand. This technology is very good for self-learning a second language. For instance, a Yoruba learner can use this application for self-assessment by speaking the little he or she has learned and allowing the system to write it down. Frequent



practice is initially required to ensure accuracy, which may not be a problem since such learning can take place anywhere the learners find themselves, provided there is access to the Internet. This application is capable of developing both spoken and written skills in the learners.

Text-to-Speech Technology

A Text-To-Speech (TTS) synthesizer is a computer-based system that should be able to read any text aloud, whether it was directly introduced in the computer by an operator or scanned and submitted to an Optical Character Recognition (OCR) system (Akshay, Amrith. Dwishanth and Rekha, 2018). According to Ubale, Bhosale, Nehe, Hubale, Avdhoot Walunjkar (2022), a Text-To-Speech (TTS) synthesizer is a computer-based system that reads aloud digital text. It is a technology in the form of a computer application that converts text into speech (Widyana, Jerusalem, and Yumechas, 2022). It can be described as a process in which text that is accepted by the system as input is processed and read out in human voice as audio output. The application is a language technology that has the ability to read out text written in different languages. In language learning, such applications or technologies can play a very important role in developing the reading skills of a language learner (i.e., they can be used as computer-assisted language learning (CALL)). The learner will type or highlight the text after selecting the target language and asking the system to read it out. The learner reads after the machine to master the pronunciation of each word as well as the intonation used to pronounce such a word. The text can be converted to English to know its meaning.

Strategy for effective and efficient use of these applications

The following are the procedures recommended by this paper for effectively and efficiently using these three emerging technologies:

1. Form Learning Content: Writes down commonly used words, phrases, and sentences properly in English. Let us use Yoruba language, for example, good morning, come and eat, where are you going to? and so on.
2. Use Language Translator: The language translator will help in converting the learning content to the target language, which could be Yoruba, which



has been chosen as an example. Google literal translation of the sample content in step 1 gives the following result:

Good morning - e kaarọ
Come and eat - wa jẹun
Where are you going to? - Nibo ni iwọ nlọ?

3. Use Text Reader: Text Reader will read out the translation in the target language (e.g. Yoruba) for learners to master the pronunciation and intonation.
4. Use Speech Recognition: After mastering the pronunciation, the learner needs to test himself or herself by saying it out while the system writes it down in the target language.
5. The text from the speech can also be translated into the English language, which is the starting point and compares the meaning. This is optional, but it may be necessary to ensure the accuracy of the initial translation. This procedure can be represented with a smart chart, as presented below:

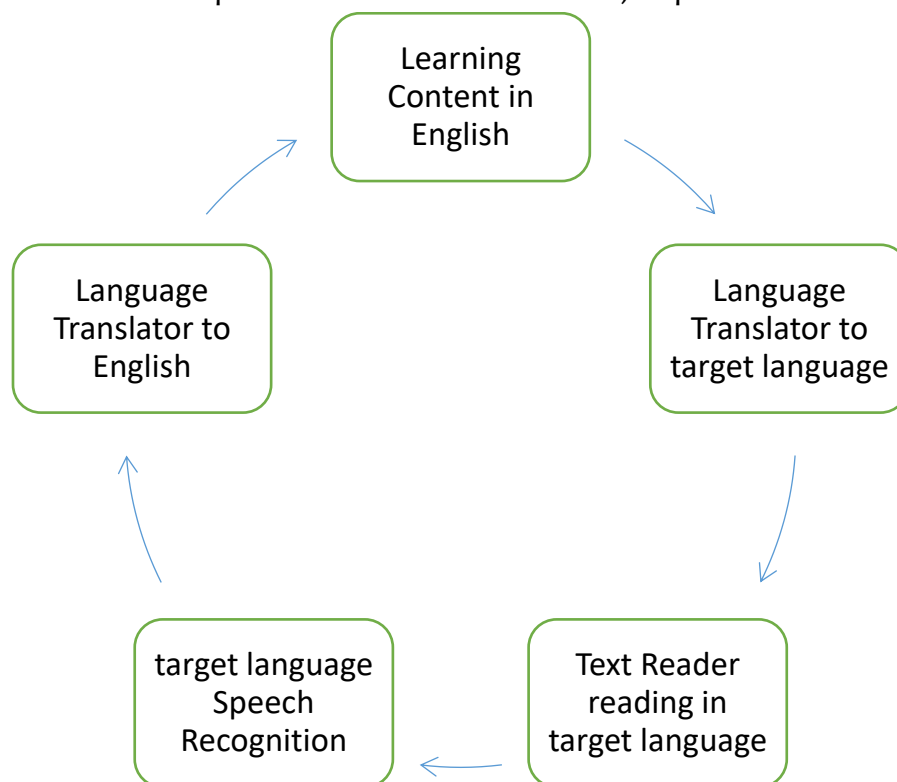


Figure 1: Autonomy learning procedure using Language Translator, Text Reader and Speech Recognition



The advantages of using these applications for learning new languages

A new language can be learned from any part of the world without any teacher by using the three applications under study. The learners will significantly improve their digital skills, which will make them relevant in this digital world. This method also provides immediate assistance to users when they find themselves in a strange environment with an unfamiliar language and culture; they can quickly use technology to adapt and survive. Even native speakers use these applications to increase their knowledge of the language. For example, many Yorubas may not be able to translate English to Yoruba without seeking help from Google Translate. The same thing is applicable to Igbo, Hausa, and other languages.

Disadvantages of using these technologies for learning a second language

The following are some of the disadvantages of learning a new language with the application under discussion: A device with an Internet connection is required, meaning that those who live in areas where there is no Internet connection cannot use the application even when they have the devices. Operational skills are also required; that is, many people who have good smart phones and access to the internet are still ignorant of all these applications.

Summary

Technology has simplified language learning greatly. Social media, computer-assisted language learning, language laboratory applications, and so on are modern ways of learning new languages with technology outside of the classroom. A language translator is an application that many people have not yet discovered its potential as a powerful tool for learning a second language. Two supportive applications that have made a language translator a complete language learning aid are text readers and speech recognition applications. These applications can develop the four skills needed in language learning, which are listening skills, spoken skills, writing skills, and reading skills.

Recommendations

Considering the vital role that learning a second language plays in the socio-economic development of a nation and the possibility of learning a new



language autonomously with emerging trends in Internet-based applications, this paper recommend the following for the benefit of many:

- Non-Governmental Organizations (NGOs) should take it upon themselves to organize seminars with a view to encouraging and motivating people to learn new languages as they create awareness of these emerging technologies.
- Internet access should be made affordable for everybody since many good things now depend on it.

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