Amelioration of Google Assistant – A Review of Artificial Intelligence Stimulated Second Language Learning and Teaching

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Abstract

Artificial Intelligence (AI) has become an undeniable technological innovation in our world. The usability of AI-powered applications has gradually increased in all fields. In need of change and adaptability in life, many AI tools have been developed to accomplish certain tasks faster. AI-featured Intelligent Personal Assistant (IPA) applications like Google Assistant (GA), Alexa, Siri, Cortona, and Bixby are involved in the process of helping humankind to achieve certain actions in a faster mode. The evolvement of Industry 4.0 and Education 4.0 triggers, as well as, challenges the language curriculum to adapt AI-based applications to engage in second language learning. Among all the above-mentioned AI-featured applications, Google Assistant predominantly involves in language learning and teaching. The main objective of this paper is to review the Al-powered Google Assistant for teaching and learning languages. It specifically reviews and examines the study on the use of Google Assistant in terms of teaching and learning a language. The approach used to evaluate the articles pulled from pertinent databases is the qualitative research method, especially content analysis. The findings of the study show that there are four distinct patterns in which AI-powered Google Assistant is used to teach and learn languages. The endorsement of AI-powered Google Assistant and pedagogy based on it proves that it is very helpful for second language acquisition.

Keywords: artificial intelligence, google assistant, language curriculum, industry 4.0, education 4.0, second language acquisition

1. Introduction

In the era of Gen Z and Alpha, humans have frequently engaged with technological inventions. Many types of research have been carried out and brought innumerable inventions and innovations for the needs of people. One of the prominent and emerging technological innovations is Artificial Intelligence. Artificial Intelligence (AI) holds an irreplaceable system for people's daily needs. Everyday AI involves people and makes certain tasks faster. AI creates interactive tasks for adults and also for children. AI-powered applications acquire more attention in the field of education more specifically in language education. It is predicted that between 2018 and 2022, AI in education will expand by 43%, as revealed in the Horizon Report 2019 Higher Education Edition (Educause, 2019), and implies that it will eventually expand toward a classroom environment. Baker and Smith (2019) define AI as "Computers that perform cognitive tasks, usually associated with human minds, particularly learning and problem-solving" (p. 10). They clarify that AI does not refer to a specific technology, but is a catchy word for a variety of technologies and approaches, including machine learning, natural language processing, natural language generation, natural language understanding, data mining, neural nets, and algorithms. Many countries adopted AI-powered applications for second language learning and teaching. Education professionals face obstacles when attempting to use social media, artificial intelligence (AI), and smartphone technology to generate cutting-edge instructional materials. Since the last several decades, there has been a significant increase in the usage of artificial intelligence to create applications, and its outcomes are now present in practically every part of our lives (Haristiani, 2019). AI has significantly improved the teaching of foreign languages due to the remarkable progress in big data management and natural language processing. The quality of student-computer interaction has substantially transformed as a result of the inevitable transition from Computer Assisted Language Learning (CALL) to Intelligent Computer Assistant Language Learning (ICALL); CALL to ICALL (Li, 2020). Due to the advancements in AI technology, many Intelligent Personal Assistants (IPAs) have been developed and involve in personalized works like reminders, automation, natural conversation, and also for second language learning.

1.1 Intelligent Personal Assistants (IPAs)

AI becomes an undeniable system of knowledge in this tech era. The apogee of Intelligent Personal Assistants (IPAs) or Automated Personal Assistants (APAs) includes Google Assistant, Siri, Amazon Alexa, Bixby, Cortana, Nina, Viv, Jibo, Google Now, Hey Athena, Jarvis, Mycroft, Braina Virtual Assistant, SILVIA, Lucida, Cubic, Dragon Go, Hound, Aido, Ubi Kit, BlackBerry Assistant, Maluuba, and Vlingo. These top IPAs assist kids, youths, and adults to perform certain tasks in rapid mode. Some of the notable IPAs are Google Assistant (GA), Alexa, Siri, and Cortana which create a language learning environment. According to Lopatovska et al., 2020, the

effectiveness of IPAs on various tasks has been compared in a plethora of studies. For instance, it has been discovered that Amazon Alexa specializes in voice-activated purchases from the Amazon website, music requests, and IoT device administration (Crist, 2016; Thompson, 2017; Villas-Boas, 2017). The potential of Google Assistant to find information is its area of expertise. Microsoft Cortana is stronger in the categories of communication management, calendar management, and reminders. In the comparison of the IPAs from Google, Amazon, and Apple, all three performed satisfactorily when it came to activities like music, navigation, productivity, cooking, and home automation (Chen, 2018). IPAs are increasingly being used by organizations in public spaces, such as healthcare sectors, galleries, workplaces, restaurants, and university halls of residence, in addition to their purposes (Lopatovska, 2019), IPAs are involved prominently in learning a language.

1.2 IPAs for Language Learning.

Young children's instinctive attraction was stimulated by speaking with the AIs, mostly to learn what the machines could and could not do. Even when their sentences were not understood, these children frequently attempted to restructure their sentences and persevered. It appears that asking questions, issuing commands such as "play some music" and receiving responses made speaking English interesting and frequently exciting for them (Underwood, 2017). It is evident that children utilize these AI-empowered gadgets for speaking a second language.

Since AI - IPA's applications provide personalized results, it helps children and adults to interact and to learn another language enthusiastically. AI provides students with a far larger selection of services, boosts learners' motivation, and broadens the audience's perspective on traditional learning methods. The pedagogical applications driven by artificial intelligence have been assisting students in acquiring a wide range of skills (Hamuddin et al., 2020). AI-driven applications provide a wide range of tasks related to personal searches and pave a new way for creating pedagogical structure, especially for English as a Second Language (ESL). Students might not make the necessary attempt to communicate with another person for a diverse range of reasons, such as nervousness, time constraints, or simple unwillingness. As Intelligent Personal Assistants (IPAs) seem to provide a feasible solution for these problems, it is crucial to investigate ASR-based technologies like this and others (Dizon, 2020).

Google Assistant, Alexa, Siri, Cortana, and Bixby provide various levels of AI interfaces for second language learning. Most of these AI applications have been tested and evaluated to identify their effectiveness for language learning. Nevertheless, the main objective of this review is to emphasize the amelioration of artificial intelligence-powered Google Assistant (GA) in second language learning and teaching. Especially, in the epoch of Industry 4.0 linked with Education 4.0, every educator has to be exposed to AI technology. When AI technology is intensively incorporated into language education, it may produce significant results in learning and teaching a language. AI applications could be a supportive language teaching tool for language teachers. The utilization of AI-powered Google Assistant (GA) may enable language learning to become more student-centered and create a personalized learning environment.

2. Methodology

In the following sections, the approaches that have been used in the recent research are explained. While analyzing the research articles it has been observed that experts talk about the study design in terms of sampling research articles, data gathering procedures, and methods of data analysis. In view of this current study, the research methodology has been adapted and modified by the researcher based on the process of content analysis provided by (Ali, 2020).

2.1 Research Methodology

The sole research question posed in this current study is answered using a qualitative research approach, more precisely "Content Analysis". The purpose of this study relies on content analysis. According to Fraenkel et al., (2012, p. 478) any written material can be subjected to content analysis, including textbooks, essays, newspapers, novels, magazine articles, recipes, music, political speeches, advertising, and images. The review of documents in this paper, nevertheless, is based on scholarly articles because the researcher has included information from these resources that is pertinent to the topic that is being investigated.

2.2 Selection of Research Articles

The study materials, particularly the comments in "Analyses" that are gathered to evaluate the implementations of AI-powered Google Assistant in Second language teaching and learning originated from the repositories – Scopus, Google Scholar, and Web of Science. As a result of the greater dependability than web search engines like Yahoo and Microsoft Bing, these resources meet the qualifying requirements. Furthermore, there is a higher level of assurance about the validity of the articles entered into previously mentioned databases. Additionally, within five years' research publications are chosen as examples for the review. The explanation is that before knowing how AI-powered Google Assistant is used in second language teaching and learning, only recent research findings are highlighted.

2.3 Data Collection Procedures

The process of gathering data for the current study involves four phases. "Identifying suitable databases" is the first process, in which the databases like Scopus, Google Scholar, and Web of Science are determined as the sources for the information. The second phase, "Explore pertinent publications," retrieves papers that examine the amelioration of AI-powered Google Assistant in second language teaching and learning. Therefore, only studies with complete articles are selected for analysis. Material synthesis is accomplished in phase three. To understand and infer the substance of the contents produced by researchers, articles are read, understood, and interpreted. Lastly, in phase

four, themes are put together to help identify noteworthy and intriguing data (Maguire & Delahunt, 2017). Figure 1 shows the procedures for gathering information for article evaluation.

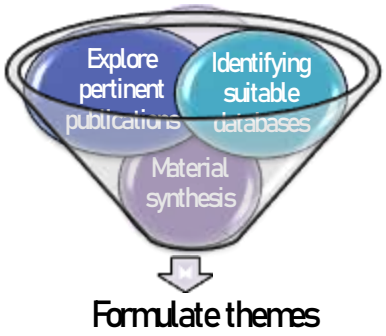

Figure 1. Procedures for gathering information for article analysis

2.4 Data Analysis Procedures

According to Fraenkel et al., (2012, p. 482), the research studies are examined in five phases or steps. To discover the pertinent articles, the researcher attempted the first step "Required Unit of Analysis," which involves selecting phrases, words, and sentences that may be entered into the database. The second step is "Track down Suitable Data," which involves tracking down pertinent information from web databases to identify recent research studies. A thesaurus is used to look up the definitions and synonyms of words, phrases, and sentences. “Construct a Concept or Rationalization” is the third step. As the researcher reviews the contents that are stated in the articles, the researcher performs skimming, scanning, analysis, and formulating. In the fourth section, Step 3 and Step 4 are blended (Green et al., 2007) in "Build a sampling plan," where the researcher uses random sampling to locate relevant data before skimming, scanning, evaluating, and synthesizing the specified articles. In performing this process, the researcher makes an effort to immerse into it ideally. The researcher was perceptive and attentive while giving the information from the relevant articles. In the fifth section, "Coherent Coding Segment," the researcher draws a crucial connection between the research articles that the researcher is reading and the process of developing codes and categories. The process, termed “memoing” (Hesse-Biber, 2010) requires the researcher to synthesize the information in the research articles. As the research draws to a close, the crucial and pertinent conclusions that emerge from the research studies published by scholars remain in the memory of the researcher. Hence, the research methodology has been adapted and modified from the analysis model provided by (Ali, 2020). The data analysis processes employed during the construction of this research article are represented in Figure 2.

Figure 2. Processes of data analysis for article review

3. Research Findings

This review tries to address the question of how AI-powered Google Assistant is examined and adapted for language teaching and learning. Regarding the research question that is presented at the beginning of the review, four themes have been determined. The themes are discussed below:

3.1 Google Assistant Is Used as a Good Natural Language-Processed Interactive Tool

Google Assistant becomes a great companion for language learning. GA recognizes human speech and responds to queries feasibly. Both children and adults engage with GA to have a conversation in a second language. In the year 2020, an experimental study was conducted using GA, especially for English language learning. The outcomes of the survey and interview demonstrate that these students valued

engaging with GA and thought it was a motivating tool for learning English. Moreover, they identified that GA can help them become more effective communicators and listeners. Further, the study mentioned that GA spoke with a very natural pronunciation and is easy to understand sentences. Additionally, the findings show that learners at higher levels were more successful in achieving mutual comprehension using GA (H. H. J. Chen et al., 2020). GA possesses good natural language processing technology which provides the best interactive sessions.

3.2 Google Assistant Is an Effective Tool for Listening, Speaking, and Reading Skills

According to H. H.-J. Chen et al. (2020), the study states that the students thought GA may increase their drive to study vocabulary, speaking, listening, and pronunciation in English. Additionally, they thought that using GA will improve their speaking, listening, reading, and vocabulary. They stated that utilizing GA to practice English speaking and listening was less stressful than other in-class activities like speaking in front of their teachers and classmates. According to Sing et al. (2019), GA is a reasonably useful tool according to three measurable criteria: the number of questions posed, the number of questions accurately answered, and the amount of time needed to do comprehension tests. Additionally, the use of Google Assistant has had a distinguishable positive impact on respondents' perceptions of the reading comprehension task itself (Sing et al., 2019). From the above experimental studies, it is evident that GA is an effective tool for learning listening, speaking, and reading skills.

3.2 Google Assistant Promotes a Personalized Learning Environment and Reduces Anxiety

In 2020, an experimental study investigated the usage of GA for language proficiency. The results state that Google Assistant increased learners' confidence in their English-language proficiency. The settings in Google Assistant that promoted helpful interactions and supplied tailored feedback is one argument that may apply. Lessening their embarrassment was a result of the lack of an open, public domain in human-machine interaction. Finally, several reserved participants thought that Google Assistant improved their English productivity and helped them participate more actively in group discussions. Moreover, it promoted a personalized learning environment. The important observation was that participants' anxiety levels were reduced by Google Assistant (77.68%). One justification given was that they believed Google Assistant fostered helpful contact and noticed the lack of a wide-open public realm (Tai & Chen, 2020). Therefore, AI-powered Google Assistant may lessen anxiety as well as fear of learning another language. It facilitates a personalized learning environment.

3.3 Google Assistant Is a User-Friendly Communicative Tool for People with Intellectual and Multiple Disabilities

Google Assistant becomes a supportive tool for people with intellectual and multiple disabilities. The results of a modest number of observational studies conclusively show that a teaching strategy employing a mobile phone with Google Assistant, recording equipment, smart appliances, and a tiny speaker was effective in promoting independent access to various forms of stimulation in people with an intellectual disability plus visual and motor impairments. Without the use of speech recording equipment, the participants were unable to obtain any stimulation during the baseline sessions. All participants were able to independently access the different forms of stimulation during the intervention and post-intervention phases with the use of Google Assistant and voice recording devices (Lancioni, Singh, O'Reilly, Sigafoos, Alberti, Campodonico, et al., 2020). GA seems to be a useful tool for communication. In another study (Lancioni, Singh, O'Reilly, Sigafoos, Alberti, Chiariello, et al., 2020), by triggering tiny speech recorders, the participants could make calls, send messages, or attend leisure events by activating the Google Assistant on their smartphones. When activated, each gadget made a distinct spoken request. The smartphone automatically reads messages it received from such partners. The participants were unable to attend leisure events, make phone calls, or send messages freely during baseline when the voice recording devices were not available. All participants actively participated during the 10-min sessions during the post-intervention period when the Google Assistant and audio recording devices were accessible as they autonomously accessed leisure activities, made phone calls, or sent and received messages. The new technological system received favorable reviews from the staff (Lancioni, Singh, O'Reilly, Sigafoos, Alberti, Chiariello, et al., 2020). Hence, it is evident that Google Assistant is an effective and user-friendly tool for communication concerning people having intellectual and multiple disabilities. Figure 3, demonstrates the broad themes that are constructed following the analysis and synthesis of articles.

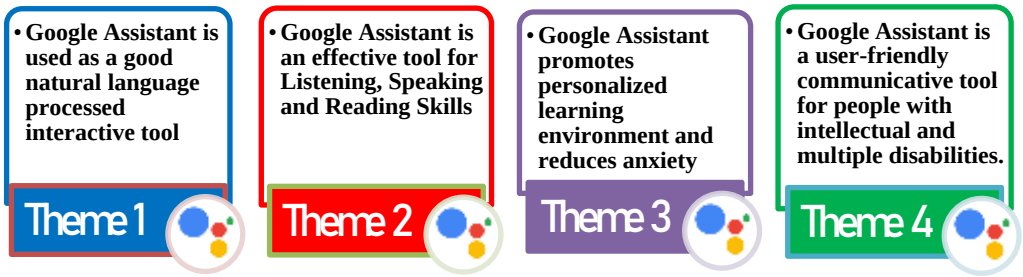

Figure 3. Framed themes as findings for the analysis of articles

4. Conclusion

The present review aims to pinpoint the amelioration of Artificial Intelligence powered Google Assistant in language learning and teaching. The following inferences are drawn from the present study: Google Assistant is a tool that can be used as a good natural language processed interactive tool, an effective tool to teach and learn listening, speaking, and reading skills, promotes a personalized learning environment, and reduces anxiety. Additionally, GA is a user-friendly communicative tool for people with intellectual and multiple disabilities. It can also help learners become more competent and productive notably learners with certain disabilities. Overall, the research supports the notion that AI-powered Google Assistant is essential for language teaching and learning because of its many advancements and advantages.

Education professionals who plan to use AI-powered Google Assistant in the classroom will be interested in these findings. However, the study of the previous papers highlighted issues with its usage in speaking, and listening, also exclusively on the effect of communication among people with multiple disabilities. The research is restricted by the absence of knowledge in other language skills, specifically writing. Further review could be assessed on writing skills. Experimental studies on AI-based applications are relevant to the language curriculum. Overall, AI-powered Google Assistant paves a new approach and method towards language learning and teaching particularly ESL and EFL.

5. List of Abbreviations

AI – Artificial Intelligence

APA – Automated Personal Assistant

CALL – Computer-Assisted Language Learning

ESL – English as a Secondary Language

EFL – English as a Foreign Language

GA – Google Assistant

ICALL – Intelligent Computer-Assisted Language Learning

IPA - Intelligent Personal Assistant

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