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Facilitating Listening and Speaking at Primary Level Using Intelligent Personal Assistant (IPA)

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Abstract

Intelligent Personal Assistant (IPA) enables Natural Language Interface between human and machine through translation of human intentions into commands by recognising users' speech and gestures. The study focuses on facilitating listening and speaking of low-competence learners at the primary level through IPA. Students at the primary level lack the opportunity to communicate in the target language, which makes them hesitant as well as anxious while using L2 in public. The proposed paper aims to understand the limitations and pedagogical usage of smart speakers such as Amazon Echo and its associated voice-controlled Intelligent Personal Assistant (IPA) Alexa for primary-level students. The researchers believe that these devices help the learners in practicing, speaking and listening in a stress-free environment and also promote learner autonomy (out-of-class learning). They intend to develop a few exercises that users can undertake to make a meaningful 'human-computer' interaction with IPA devices.

INTRODUCTION

Intelligent Personal Assistant (IPA)/ Intelligent Virtual Assistant is an AI-driven program that follows voice commands to complete tasks like setting reminders, getting some information, finding mathematical solutions, ordering food or listening to music and binge content. This tech works on the methods of Natural Language Processing (NLP), Machine Learning (ML), Automatic

Speech Recognition (ASR), etc. IPAs can be installed on smartphones, tablets, and smart speakers, and they can be activated in various ways, including text messages for Google Assistant and voice commands for Google Home and Amazon Smart Speakers (Hauswald et al., 2015). There are various types of Virtual Assistants available in the market, some of which are listed below, along with their features.

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Siri

Siri was first launched in 2010 as an app and was later acquired by Apple. It has added many more features since then, and now it is one of the most accurate voice assistants in the market. To wake it up, the user simply says, “Hey Siri,” and it starts following the commands. Even if you are getting bored, there are hundreds of recorded responses that can make communication a fun activity.

Google Assistant

Google took many years to launch its flagship voice assistant AI software. Studies suggest that it is at the top of the pile in understanding users’ commands and resolving queries correctly. The study conducted by the Loup Ventures team asked around 800 questions to Siri and Google, and Google Assistant was able to understand 100 percent of the questions and answered 92.9 percent correctly, (Bell, 2019).

Alexa

It is certainly the most popular voice assistant in the world and is being used by millions of people at the present time. Powered by Amazon, it comes in various devices (with screen and without screen), Amazon calls them home speakers, and according to the data, Amazon has sold around 100 million Alexa-powered gadgets by January 2019. Amazon smart speakers can integrate different skills from Amazon Alexa skills and the Alexa Skills Kit (Ask), and Google Home

Smart Speakers; capabilities can be upgraded via Google Actions. There are millions of skill programs available for these devices which allow learning in a creative way. For example, if the user subscribes to some storytelling skill while narrating the story, it offers choice-based questions to listeners before moving forward. It increases the participation of the listeners at the same time, improves the concentration of the students to listen attentively. Based on this background, the paper deals with answering the following two research questions:

- RQ 1. **Can IPA devices enhance L2 learners’ listening abilities at the primary level?**
- RQ 2. **Can IPA devices enhance L2 learners’ speaking proficiency at the primary level?**

LITERATURE REVIEW

The researchers have conducted a systematic literature review focusing on the impact of IPA in second language learning. With the advancement of technology, IPA has become more accurate in dialogic interaction over the years, and the researchers have an understanding that this technology can be used to fill the space between learning a language in class and practicing it at home, especially in improving pronunciation, listening and speaking abilities (Barcomb et al., 2017). So far, very few studies have been done in this area; however, researchers have tried incorporating a few findings from previous research that support our hypothesis.

According to a comparative study conducted by Department of English, National Taiwan Normal University, a significant difference was found in the speaking efficiency of the participants. The research suggested that learners can improve their speaking skills by interacting with IPA devices. Dialogic interactions can improve language development, according to interactionist theory, since they naturally create chances for input, output, and interaction (Long, 1996). In IPA-mediated interaction, the user gets the opportunity to speak and listen in the target language, and in this process, learners have the opportunity to negotiate for meaning and receive feedback which in some way allows the learners to notice the gap between the intended meaning and the meaning suggested by the AI in the target language (Pica, T., 2013). Studies have identified that users can develop interactive tasks or ask follow-up questions to acquire any information.

In machine-human interaction, Engwall et al (2021) identified four roles: Interviewer (seeking information), Interlocutor (asking questions or giving comments to promote equitable engagement of learners), Narrator (giving opinion or information in answer to inquiries), and Facilitator (asking questions or making comments to encourage learner interaction). In the case of Facilitators or Interlocutors, learners are more under pressure to take initiative during their interactions, according to

the researchers. They discovered that learners actively practiced with IPAs in significant ways.

JUSTIFICATION

The researchers have based their study on the findings of a research team from NCERT commissioned by MHRD during 2009–10. The study was titled, ‘The Study on the Teaching of English in Government Schools at Primary Level in India.’ The design of the research was prepared for Sarva Shiksha Abhiyan. The study’s findings inspired the researchers to discover answers to the challenges that affected our primary-level English teaching and learning system. The objectives of the study (NCERT), which are in connection with our research area, were; ‘To ascertain the status of teaching English at the primary level both as a subject and medium of instruction, and ‘To observe the training programmes (both pre-service and in-service) for teachers of English and to assess their competence in teaching English at the primary level.’ The study methods were ‘Discussion with teachers’ and ‘observation of the classroom.’ The major findings of the study are summarised below:

- The State textbooks for level 1 (Classes I and II) put less emphasis on listening and speaking abilities and do not foster language affinity.
- Children are not given the opportunity to hear or talk in English. They cannot tell stories, discuss ideas or hold a

simple conversation in English.

- In the pre-service teacher training programme, theory takes precedence over practice.
- The actual hands-on experience is missing during the teacher training in some cases.

Teachers are generally in the habit of resorting to the local language to facilitate the L2 learners. This way, the learner never gets to frame sentences naturally in the second language and starts translating in the mind before uttering. The absence of a companion at home to converse in the target language disrupts the practice of learning, it is also rare to see the teachers develop speaking and listening proficiency. Observing the classroom, it was discovered that most teachers asked the questions to the students, but they were not prompted to ask the teacher. This deprived the youngsters of communication, command, and confidence skills.

The study concluded that teachers need to be well-trained to teach English as a language. The usage of multimedia in training has been recommended as a way to improve their communication abilities. An important insight is that textbooks should include activities and questions that provide room, time, and freedom for the kid to develop creativity and imagination. Students should also practice asking a wide variety of questions (personal, comprehensive, grammar, and general questions) as well as answering them.

Use of IPAs in Language Learning

It is well known that IPAs promote dialogic interaction, and researchers have identified their use in language classes. Previous studies have found that most students enjoy using IPAs and believe they can improve their listening and speaking skills. Using these devices, learners feel more engaged and stress free also they are in a constant learning environment which allows them to speak more of L2 at their convenience. According to the results of a survey (Chen et al., 2020), Google Home speakers are motivating, and students love the interactive experience, and consider them to be a valuable tool for improving their listening and speaking skills.

When it comes to communication methods, studies have discovered that users learn to limit communication breakdown by employing a range of strategies. In a study, Underwood (2017) devised a series of exercises and requested primary school students to utilise IPAs effectively for over nine months; while analysing the results, the researcher discovered that students could repeat, reformulate or self-correct to get replies from their IPAs. Similarly, Moussalli and Cardoso (2020) discovered that learners utilised tactics like repeating or rephrasing questions to prevent communication breakdowns.

According to a study conducted by Winker and Sollner (2019) on 21 groups who used IPA in solving problem tasks. These groups engaged with IPA gadgets, and the study

documented their experiences. The findings implied that user groups made greater efforts to accomplish a task and contributed more uniformly to its completion. The results showed that users, conversations flowed more naturally since they were less frequently interrupted by one another. It is also important that participants communicate with smart tutors rather than human tutors because they feel more at ease and confident doing so. Some people like these tools because they feel more in control of the situation and are relieved of the strain of finishing the assignment effectively.

METHOD

The researchers have examined the guidelines and activities used in schools to improve English communication skills, as well as the teaching and learning methods of English at the elementary level (NCERT). The results and recommendations from the NCERT studies (2009–2010) were also followed by the researchers.

Statistics of the ASER Report 2021 (Rural)

According to the report, even though the availability of smartphones increased from 36.5 per cent in 2018 to 67.6 per cent in 2021, more children in private schools had smartphones at home (79 %) compared to government school-going children (63.7 %) (Annual Status of Education Report Centre, 2021).

Even though the majority of the respondent States/UTs are in the process of mapping the access of digital devices to their learners across the schools, only a handful have highlighted to have more than 75 per cent of learners with access to either a TV/radio or internet (ASER Report, 2021).

National Council of Educational Research and Training (2020)

In the syllabus designed by the NCERT, these are suggested skills that need to be fostered in the learners for the development of linguistic

Table 1
Learning Enhancement Activities for Students Having Access to Digital Devices

Classes/Subjects	Learning Opportunities to be Provided
For Class I-II Language and Mathematics	<ul style="list-style-type: none"> • Listening to and reading interesting stories • Challenging daily life-related problems
For Class III-V Language and Mathematics and EVS	<ul style="list-style-type: none"> • The focus will be on listening, speaking, and reading • Age-appropriate physical activities integrated with music and dance
For Class VI-VIII (Upper Primary)	<ul style="list-style-type: none"> • The focus will be on listening, speaking, reading, and writing, as well as doing activities • Reading stories and supplementary material

proficiency for the appropriate use of language in different situations:

- The learner should acquire the ability to listen and understand and should be able to employ non-verbal clues to make connections and draw inferences.
- The learner should be able to employ communicative skills, with a range of styles, and engage in a discussion analytically and creatively.
- It is important for the learner to notice that different languages and language varieties are associated with different domains and communicative encounters.
- The learner should develop the habit of reading for information and pleasure, draw inferences and relate texts to previous knowledge, read critically, and develop the confidence to ask and answer questions.

Level-1 (Classes I-II)

Objectives

The general objectives at Level-1

- To build familiarity with the language primarily through spoken input in meaningful situations.
- (Teacher talk, listening to recorded material, etc.).
- To provide and monitor exposure to and comprehension of spoken, and written inputs (through mother tongue, signs, visuals, pictures, sketches, gestures, single word questions or answers).

- To help learners build a working proficiency in the language, especially concerning listening with understanding and basic oral production (words or phrases, fragments of utterances, formulaic expressions as communicative devices).
- To recite and sing poems, songs, and rhymes and enact small plays or skits.

Level-2 (Classes III, IV and V)

Objectives

- To enrich learners' vocabulary mainly through telling, retelling, and reading aloud of stories or folktales in English.
- To use appropriate spoken and written language in meaningful contexts or situations.
- To give them an opportunity to listen to sounds or sound techniques and appreciate the rhythm and music of rhymes or sounds.

METHODS AND TECHNIQUES

(At Level 1, there will be a shift of emphasis from learning limited input (textbook) to providing exposure to a wide range of inputs).

- An oral-aural approach to be followed (with a limited focus on reading and writing depending on the level).
- Learner-centered activity-based approach including bilingual approach.

In most places, children are not exposed to English outside the classroom. The teacher’s proficiency in spoken English in these cases

becomes all the more essential. Students may listen to English and process the new language before they actually begin to communicate in English (NCERT, 2006).

Table 2

Need of Virtual Assistance (Classroom)	Need of Virtual Assistance (Home)
<ul style="list-style-type: none"> • Teachers are unable to pick questions from all the students 	<ul style="list-style-type: none"> • Communication break at home in the absence of a companion
<ul style="list-style-type: none"> • Ample opportunities for students to speak and listen in the target language 	<ul style="list-style-type: none"> • Parents are not comfortable in the second language
<ul style="list-style-type: none"> • It enables the students to be creative 	<ul style="list-style-type: none"> • The future of parenting- leaving children at home alone • Parents get irritated by the torrent of questions asked by the children

Activities that can be Done in the Classroom Using IPA Devices

1. Develop phonemic awareness through activities focusing on different sounds, emerging from the words in stories and texts.
2. Sing or recite collectively songs or poems or rhymes with actions.
3. Listen to stories, and humorous incidents, and interact in English or the home language.
4. Ask simple questions like names of characters from the story, incidents that they like in the story, etc. (Ensure clear lip movement for children).
5. Use greetings like ‘Good morning’, ‘Thank you’ and have polite conversations in English such as ‘What is your name?’, ‘How are you?’ etc.
6. Listen to short texts from the

- children’s section of newspapers.
7. Listen to instructions and draw a picture.
 8. Enrich vocabulary in English through listening to stories and folktales.
 9. Identify opposites and use them in communication, for example, ‘tall/short’, ‘inside or outside,’ ‘fat/thin’, etc.
 10. Participate in classroom discussions on questions based on the day-to-day life and texts they already read or heard.
 11. Use meaningful grammatically correct sentences to describe and narrate incidents; and for framing questions.
 12. Use synonyms such as ‘big or large,’ ‘shut or close,’ and antonyms like inside or outside, light or dark from clues in the context.

Table 3
Pedagogical Usages of IPA Devices

Saves Time	<ul style="list-style-type: none"> • It can take care of less critical tasks, and teachers can focus on their core activities • It takes lesser time than typing
Helps Students	<ul style="list-style-type: none"> • It can answer routine factual questions • It can post weekly assignments • It can randomly create groups of students for discussion or other activities
Increases Efficiency	<ul style="list-style-type: none"> • It decreases the burden on the teacher by assisting in various activities • The teacher need not repeat the answers in every batch it can memories and answer them for you
Facilitates Personalisation	<ul style="list-style-type: none"> • Both Amazon Alexa and Google have templates and blue prints that enable the teachers to use them for specific classroom activities
Promotes Communal Learning	<ul style="list-style-type: none"> • It allows the students to hear the results of the search so they can maintain eye contact instead of looking into computers while researching something

Casual Interaction Done by Michael Bizzaco and Erika Rawes with Amazon Alexa

- Q. *Alexa, do you like pizza?*
A. While I appreciate great food and drink, my good taste is better reflected in the company I keep.
- Q. *Alexa, are you married?*
A. I'm happily single.
- Q. *Alexa, what do you want to be when you grow up?*
A. I want to be the computer from Star Trek.
- Q. *Alexa, what's your favorite movie?*
A. The Empire Strikes Back is my all-time favorite. It's impressive, most impressive.

- Q. *Alexa, are you pretty?*
A. Beauty is in the eye of the beholder.
- Q. *Alexa, who is your best friend?*
A: I have a really strong connection to your Wi-Fi.
- Q. *Alexa, what's your favorite color?*
A. I like ultraviolet. It glows with everything.

CONCLUSION

IPAs can be installed and activated in various methods on smartphones, tablets, and smart speakers (like text messages for Google Assistant and voice commands for Google Home and Amazon Smart Speakers). According to Semrush investigation, these gadgets can respond to 93.7 per cent

of search queries (Todorov, 2021). The study has emphasised the necessity of virtual aid in the classroom and the potential of these tools to support teachers in their work while assisting students in their learning. By giving them plenty of opportunities and

improving comprehension, it helps the students improve their speaking and listening skills. By prompting follow-up questions, it promotes communication skills and teaches how to connect new knowledge with prior knowledge.

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