The Role of Intelligent Personal Assistants in Migrant Learners' Willingness to Communicate in English as a Second Language

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ABSTRACT

Modern approaches to second language (L2) pedagogy emphasise communicative competence as part of the language teaching goals. However, it has been observed that some learners are more willing to engage in L2 communication than others, and that this disposition may be affected by several variables that are not bounded to their linguistic competence. In the case of migrants, who are required to learn and use a second language to integrate into their new environment, there is a critical need for opportunities and resources to support their Willingness to Communicate (WTC) beyond the classroom. Intelligent personal assistants (IPA) offer a dynamic oral conversational opportunity in language learning that seems to have potential for improving language learners' Willingness to Communicate. As part of this doctoral study, a conversational experience will be designed to bring together conversational and instructional principles that take into consideration the learners' needs, their environment, and instructional activities to produce output in the English language. The research is of benefit to educators, and the HCI and UX community that is focused on the design or implementation of conversational experiences with IPAs in language learning.

CCS CONCEPTS

• **Human-centered computing** → Interaction design; Interaction design process and methods; Activity centered design.

KEYWORDS

Intelligent personal assistants, willingness to communicate, conversation design, mobile learning, language learning

1 PHD PROGRAM

I joined the Institute of Educational Technology at The Open University in the UK as a doctoral researcher in October 2020. I have

now started my second year as a full-time student and it is projected that I will finish my research project by September 2023, with a possibility of an extension to submit by October 2024.

The PhD program in the UK requires full-time funded students to commit to their projects and allows me to take any required or needed training pertaining to research skills. I attend online presentations, seminars, conferences, or workshops that cover a range of topics such as research methods, data analysis, mobile learning, UX and conversational design, among others.

In the current stage of my research plan, I am focusing on understanding the learners' needs and their interactions when using voice assistants to practice English in their everyday life. At the same time, I am deepening my knowledge of design principles for voice interactions and how these can be applied when designing voice-based actions for educational purposes.

2 RESEARCH CONTEXT AND MOTIVATION

Intelligent Personal Assistants (IPA), also known as Intelligent Assistants (IA) or voice assistants, have become commercially available in the last 10 years. The advancement of voice-activated technology has allowed several industries to integrate it in their services, and people are adopting its personal use in various devices such as smartphones, smart speakers, wearables, and smart displays. With the rapidly increasing number of users among the most popular IPAs on the market [1]–[3], there is now more data about the kinds of interactions that users and voice assistants are having [4], [5].

IPAs have been of interest to researchers across different fields, especially those in general computing, infrastructure, usability, and health [6]. However, research focused on IPAs in education is at a younger stage compared to other fields. This provides us with areas of opportunity to further study the current usage and application of IPAs in education.

Due to their natural-like conversational features, IPAs seem to be of potential use in language learning. IPAs on mobiles is of particular interest for this study that involves the participation of migrant learners of English in the UK. The study aims to investigate learners' interactions with a voice assistant outside the classroom to examine how their Willingness to Communicate (WTC) in a second language (L2) may be influenced by these interactions in other settings such as in class with their peers, and in real-life scenarios. In the pilot study, as it will be described below, the voice assistant selected was Google Assistant.

One major aspect of this study is that although IPAs have been improved considerably over the last few years, the current voice experiences are not designed to target second language learners.

Therefore, I propose to bring together conversational and instructional principles to design voice experiences that take into consideration the learners' needs, their environment, and instructional activities to produce output in the English language.

3 RELATED WORK

Research has found that learners could benefit from implicit and explicit feedback (e.g. app transcriptions, IPA asking for clarification or comments) in order to continue communication with the assistant, to lower learners' affective filter, and to develop strategies to overcome breakdowns in communication [7]–[9]. Furthermore, IPAs may promote a more comfortable and private environment that supports learners' oral interactions when practicing a second language (L2), where they do not feel judged by their interlocutor, and they can manage their own learning time.

Focusing on the aspects of oral communication, researchers' findings [10]–[12] demonstrate that there is a need to investigate unobtrusive and accessible tools that can support self-regulated activities that help learners overcome language barriers, promote authentic communication, and regulate affective states in both formal and informal learning contexts. The existing literature in language education with IPAs has identified the need for more research that investigates the following: learners' and teachers' perceptions towards the use of IPAs for language learning purposes [7], comprehensive understanding of pedagogical ways to improve language development [8], designing tasks to produce language [13], and contrasts between learners' self-perceived learning outcomes and their teachers' [14].

4 RESEARCH QUESTIONS

4.1 Pilot study

A pilot study has been conducted to identify the user personas by collecting data on the learners' needs, their environment, and their use of Google Assistant to practise or learn English. This will not only help me know about the current behaviour patterns, but also their difficulties and learning needs with respect to practising the language and available resources in their environment. Similarly, the data collected at this stage will provide me with insights to start the design process of the conversational experience for the main study.

RQ1. In what ways do learners use Google Assistant to practise or learn English?

RQ2. What are the learners' perceptions and attitudes towards the use of Google Assistant for English language Learning?

RQ3. What are the strategies learners use to overcome challenges and broken communication with Google Assistant?

4.2 Main study

The main study intends to expand knowledge on how conversational experiences through IPAs may support migrant learners in the process of developing oral abilities and increase our understanding of learners' Willingness to Communicate in different settings.

RQ1. How does using an IPA (Google Assistant) influence migrant learners' motivation, anxiety, self-perceived competence, and communication strategies in formal and informal settings?

RQ2. What are the teachers' and learners' perceptions and attitudes in relation to IPAs and their influence on WTC in the L2?

RQ3. How do interactions with IPAs influence learners' L2 WTC in their real-life contexts?

5 RESEARCH PROGRESS

During my first year, I reviewed literature on IPAs in language learning, oral communication, and the model of willingness to communicate, to familiarise myself with previous research and identify gaps and areas where more research is needed. I reviewed previous methodologies, devised, and conducted the pilot study with 10 participants at basic and intermediate levels of English that were interested in practicing their oral abilities in English in the UK. As part of the process, I submitted and was successfully granted ethical approval by The Open University's Human Research Ethics Committee. This pilot study has been planned to be conducted online due to COVID-19 guidelines. Any interaction such as orientation, administration of questionnaires and interviews with participants have been in digital formats in order to adhere to UK Government and my university's current guidelines.

Participants of the pilot study were recruited in Hispanic and Latin American online communities. They did not necessarily have previous experiences with an IPA, and most of them had never used them to practise the English language. During the study, participants were sent a pre and post questionnaire, one daily English activity for six days and were asked to complete questions that explored their interactions, challenges, course of action, and things they liked and learned in a digital diary log.

Due to the proficiency level of participants, all data was collected in their primary language (Spanish). After the intervention, eight participants agreed to participate in semi-structured interviews to talk about their experiences, perceptions and to enquire into their interactions with the assistant. All the data has been transcribed and translated into English in preparation for the analysis. I have started coding the interviews using a thematic analysis approach. The results obtained from this pilot study will provide a baseline to further implement and investigate Google Assistant in the main study.

6 RESEARCH APPROACH, METHODS AND RATIONALE

The main study will employ a multiple-case study approach to obtain a holistic understanding of learners' L2 Willingness to Communicate when interacting with Google Assistant outside the classroom, and how WTC may be transferred to other contexts in learners' lives. Multiple-case design allows the researcher to undertake in-depth examinations of processes and outcomes as well as to identify how individual cases might be affected by different environments and how specific conditions might be related [15].

Each learner will be considered a case as they will use the IPA outside their class time, meaning that each learner will be in different environments and context when they complete the tasks of the assigned activities. They will then be observed by me, the researcher, in the class setting to monitor their progress. As the purpose of this study is to gain understanding and expand knowledge on how interactions with IPAs influence learners' WTC and

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the chosen variables, this design will allow me to identify similarities and differences between each case. Consequently, I would be able to see the generated patterns across the group of participants (learners) and how the teacher's perceptions match those of the learners (i.e., self-perceived competence in the L2).

6.1 Data collection methods

During the intervention, learners will use Google Assistant on their smartphones and complete tasks adapted by the teacher once a week. Tasks will require learners to gather information to prepare for the next session in class and to have simulated conversations regarding daily life topics. Data will be collected for 10 weeks using a variety of methods. Questionnaires will be administered before and after the intervention to gather learners' self-reported WTC with items focused particularly on motivation, self-perceived competence, anxiety, and communication strategies. Semi-structured diary logs will be used to gather information about the overall learners' experiences and interactions with Google Assistant outside the classroom. In order to obtain richer data about the fluctuation in the mentioned variables over the 10 weeks, diaries will include questions related to their perceptions of their motivation, self-perceived competence, anxiety and communication strategies after each task every week. This will allow me to extract more detailed data on how learners' interactions with voice experiences in Google Assistant impact these variables in every session.

In order to find out how self-reported data matches learners' L2 WTC performance, I will conduct in-class observations with the teacher to monitor learners' WTC behaviour in a formal educational environment. The objective of observations besides validating any possible self-reported data, is to see if there is a possibility that learners transfer WTC from their interactions with Google Assistant to the classroom. Semi-structured interviews will be conducted after the post questionnaire is administered. One important aspect of this study is to gather data from the teacher too. Teacher's data will be gathered through records of learners' performance based on her observations and assessment, as well as a semi structured interview.

7 RESULTS AND CONTRIBUTIONS TO DATE

At this moment in time, I am analysing the data which I have obtained from my pilot study. By the time of the conference, I would have analysed and assessed the feasibility and refined the main study to move on to the design phase of the conversational experience or 'action' for Google Assistant.

During the initial analysis of the interviews, a few patterns have been observed in the participants' interactions with the voice assistant, such as participants expressing they would like more guidance about the assistant's features and capabilities, or having formed mental models about how an IPA works; participants reported missing some important features we would normally have in human-human communication (e.g. asking for repetition or to slow down the speed in speech). Other emerging observations revolve around the perception of the chosen voice by each participant, the level of relationship or proximity they have with the assistant, emotions during their interactions, strategies in communication, and awareness of the learning process.

7.1 Expected next steps

After analysis of the pilot study, I intend to formulate and prepare my main study, starting with the design of a conversational action for Google Assistant as the first phase of the process, which I will test as part of the main study. Next, for the instructional intervention phase I will prepare the data collection instruments, obtain ethical approval, undertake data acquisition and analysis.

7.2 Dissertation status and long-term goals

Having started my second year, I have undertaken an in-depth literature review. The literature review will be ongoing during my studies. I have formulated the methodology which I am testing as part of my pilot study and will implement in my main study. To date, I have not started the formal writing that will comprise my thesis as I am analysing data from the pilot study.

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REFERENCES

[1] M. Bronstein. "A more helpful Google Assistant for your every day," Jan. 07, 2020. https://blog.google/products/assistant/ces-2020-google-assistant/ (accessed Oct. 06, 2021).

[2] B. Kinsella. "Amazon Now Claims Hundreds of Millions of Alexa-Enabled Devices and Hundreds of Millions of Weekly Smart Home Interactions," Jan. 06, 2020. https://voicebot.ai/2020/01/06/amazon-now-claims-hundreds-of-millions-of-alexa-enabled-devices-and-hundreds-of-millions-of-weekly-smart-home-interactions/ (accessed Oct. 06, 2021).

[3] B. Kinsella. "U.K. Smart Speaker Usage Doubles in 2018, Growth Expected to Slow in 2019, Amazon Commands 68% Market Share," Jan. 02, 2019. https://voicebot.ai/2019/01/02/u-k-smart-speaker-usage-doubles-in-2018-growth-expected-to-slow-in-2019-amazon-commands-68-market-share/ (accessed Oct. 06, 2021).

[4] B. Kinsella. "Smart Speaker Owners Agree That Questions, Music, and Weather are Killer Apps. What Comes Next?," Mar. 12, 2019. https://voicebot.ai/2019/03/12/smart-speaker-owners-agree-that-questions-music-and-weather-are-killer-apps-what-comes-next/ (accessed Oct. 05, 2021).

[5] PwC. "Consumer Intelligence Series: Prepare for the voice revolution," 2018. Accessed: Oct. 09, 2020. [Online]. Available: pwc.com/cisvoiceassistants.

[6] A. De Barcelos Silva et al., "Intelligent personal assistants: A systematic literature review," Expert Syst. Appl., vol. 147, p. 113193, 2020, doi: 10.1016/j.eswa.2020.113193.

[7] S. Moussalli and W. Cardoso, "Intelligent personal assistants: can they understand and be understood by accented L2 learners?," Comput. Assist. Lang. Learn. , vol. 33, no. 8, pp. 865–890, 2019, doi: 10.1080/09588221.2019.1595664.

[8] G. Dizon, "Using intelligent personal assistants for second language learning: A case study of Alexa," TESOL J., vol. 8, no. 4, pp. 811–830, Dec. 2017, doi: 10.1002/tesj.353.

[9] G. Dizon and D. Tang, "Intelligent personal assistants for autonomous second language learning: An investigation of Alexa," JALT CALL J., vol. 16, no. 2, pp. 107–120, Aug. 2020, doi: 10.29140/jaltcall.v16n2.273.

[10] A. Palalas, "The Ecological Perspective on the 'anytime anyplace' of mobile-assisted language learning," Technol. Mob. w kształceniu językowym, pp. 29–48, 2015.

[11] C. D. Epp, "English language learner experiences of formal and informal learning environments," in Proceedings of the Sixth International Conference on Learning Analytics & Knowledge, 2016, vol. 25-29-April-2016, pp. 231–235, doi: 10.1145/2883851.2883896.

[12] M. Gaved and A. Peasgood, "Fitting in versus Learning: A challenge for migrants learning languages using smartphones," J. Interact. Media Educ., vol. 2017, no. 1, pp. 1–13, 2017, doi: 10.5334/jime.436.

[13] J. Underwood, "Speaking to machines: motivating speaking through oral interaction with intelligent assistants," 2021, doi: 10.14705/rpnet.2021.50.1247.

[14] T. Y. Tai and H. H. J. Chen, "The impact of Google Assistant on adolescent EFL learners' willingness to communicate," *Interact. Learn. Environ.*, pp. 1–18, Nov. 2020, doi: 10.1080/10494820.2020.1841801.

[15] A. J. Mills, G. Durepos, and E. Wiebe, "Multiple-case designs," in *Encyclopedia of case study research*, 2012, pp. 583–584.