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ВЛИЯНИЕ ТЕХНОЛОГИЙ НА РАЗВИТИЕ ОБРАЗОВАНИЯ

EVOLUTION OF TEACHING AND LEARNING THROUGH TECHNOLOGY

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Prospects of integration of virtual assistants in the process of teaching speaking to the beginner learners of the Japanese language

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Abstract. *Problem statement.* Most Japanese textbooks and methodical materials do not contain enough exercises for training productive skills of the students. Japanese Language Proficiency Test also does not include parts dedicated to writing and speaking abilities, which leads to teachers not paying attention to the development of these skills and students not being able to properly evaluate their level of performance. As a method of simplifying and making this training more engaging and motivating, virtual assistants, or intelligent personal assistants (IPA), can be introduced. The purposes of this research are to explore the ways of using the technology of virtual assistants to reenforce speaking performance of the beginner students in Japanese as a foreign language and to evaluate the technology's readiness for integration. *Methodology*. In a pedagogical experiment took part 12 first-year students (10 female and 2 male), who attended a Japanese language class at the School of Young Philologist at the Faculty of Philology of Lomonosov Moscow State University, where they used Google Assistant for studying Japanese from December 2021 to April 2022 and then in September 2022. The analysis of theory and methodology, generalization of crucial scientific papers on the studied problem, processing of results were applied. *Results.* Personal assistant Google Assistant can be advised for training speaking among beginner learners. It can be applied in the form of four main types of exercises: asking for data, giving instructions to IPA, express desires ("wishlist"), conducting a dialog with a robot. Issues that can cause difficulties to students were listed. The results of the questionnaire revealed that students were grateful to have an opportunity to train speaking with a Japanese native speaker in a form of a virtual assistant and could easier track their progress. *Conclusion.* The use of the Google Assistant in the process of teaching speaking to the beginner learners of the Japanese language at the initial level is seen as highly promising and can be recommended for implementation in the educational process.

Keywords: intelligent personal assistants, speech recognition, teaching Japanese, foreign language, productive skills

Conflicts of interest. The author declares that there is no conflict of interest.

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Перспективы внедрения технологии голосовых помощников при обучении говорению на японском языке на начальном уровне

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Аннотация. *Постановка проблемы*. Большинство японских учебников и методических материалов не включают в себя достаточного количества упражнений для тренировки продуктивных навыков учащихся. Нихонго норёку сикэн, экзамен по определению уровня владения японским языком среди лиц, для которых японский язык не является родным, также не содержит разделы, посвященные навыкам письма и устной речи. Это приводит к тому, что учителя не уделяют должного внимания развитию этих навыков, а учащиеся не имеют возможности определить, насколько хорошо развиты их продуктивные навыки. В качестве метода решения данной проблемы предложено использовать голосовой помощник Google Assistant. Цели исследования – изучить, насколько технология «голосовой помощник» готова к внедрению в учебный процесс среди изучающих японский язык как иностранный на начальном уровне, и рассмотреть способы ее внедрения. *Методология.* В педагогическом эксперименте приняли участие 12 студентов первого года обучения (10 девушек и 2 юношей), посещавших занятия по японскому языку в Школе юного филолога филологического факультета МГУ имени М.В. Ломоносова, в ходе которого они использовали Google Assistant для изучения японского языка с декабря 2021 г. по апрель 2022 г. и в сентябре 2022 г. Применялся теоретический и методологический анализ, изучены научные работы по теме исследования, обобщены результаты анкетирования. *Результаты.* Google Assistant хорошо себя показал в рамках тренировки навыка говорения среди учащихся. Выделены четыре общих группы упражнений, которые можно предложить учащимся: сбор данных, управление технологией с помощью инструкций, оповещение о своих желаниях и «диалог с роботом». Определены возможные трудности при работе с голосовым помощником на японском. В рамках анкетирования учащиеся дали положительную обратную связь, отмечая, что рады, что у них есть возможность потренировать говорение с носителем языка в виде голосового ассистента и лучше отследить собственный прогресс. *Заключение.* Применение голосового помощника Google Assistant в процессе обучения разговорной речи изучающих японский язык на начальном уровне видится высоко перспективным и может быть рекомендовано для внедрения в учебный процесс.

Ключевые слова: интеллектуальные персональные помощники, распознавание речи, преподавание японского языка, продуктивные навыки

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Problem statement. Over the last 20 years the Japanese language reached the status of one of the most popular foreign languages due to its promotion of mass culture such as Japanese music, games, and animation. As the last "Survey Report on Japanese-Language Education Abroad" conducted by Japan Foundation in 2021 shows, now there are 3,794,714 Japanese learners over the globe.[1] The COVID-19 pandemic shifted the public focus from language learning to the sphere of health and welfare and therefore negatively affected cultural exchanges, but the results presented by Japan Foundation before the start of the pandemic showed the 36% growth in the number of the Japanese language learners in Russia from 2015 to 2018 (from 8,650 to 11,764).[2]

To evaluate the knowledge of the Japanese language, students and teachers use the system implemented in the Japanese Language Proficiency Test. Established in 1984, JLPT attracted more and more participants each year, with exceeding 1 million examinees in 2017 and reaching the number of 1.36 million applicants in 2019. In 2009 JLPT was reorganized to fill the gap between former N2 and N3 levels and to redefine the scoring system, but it is noted by some researchers that the test still has challenges for appropriate use and should be improved. Despite Agency for Cultural Affairs insisting on the implementation of the part dedicated to the evaluation of the productive skills (speaking and writing) into the test structure back in 2001, to this date those parts were not introduced.[3] In many cases the results of the JLPT scores are used when applying for a job position in Japan or entering a university, so educators design teaching material keeping in mind the requirements for passing JLPT, which leads to the washback effect. Due to the absence of the sections in the JLPT test attributed to productive skills, educational materials for students learning the Japanese language also tend to not pay enough attention to the training of these skills [1].

This fact can be proven by examining the most popular educational textbooks for Japanese learners. For this study the material for beginner level that is

[1] Learning Japanese changed my life – a passport to the future gained through Japanese language learning. Japan Foundation. Available from: https://jf50.jpf.go.jp/en/story/learning_japanese_changed_my_life/#:~:text=The%20latest%20survey%20revealed%20that,increased%20by%20about%2030%2Dfold (accessed: 07.04.2023).

[2] Survey report on Japanese-language education abroad 2018. Japan Foundation; 2020. Available from: https://www.jpf.go.jp/j/project/japanese/survey/result/dl/survey2018/Report_all_e.pdf (accessed: 07.04.2023).

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frequently used in Russia was reviewed. The only type of speaking exercises in the popular textbook "Minna no Nihongo" is substitution drill, where students are given a dialogue and then must change the underlined words to the listed below [2]. The same applies to E. Strugova and N. Sheftelevich's "Let's Read, Write, Speak in Japanese" [3]. Training of speaking is better implemented in the Japanese textbook "Genki", that has role-play exercises which students can do in pairs [4]. In that regard the course "Marugoto" can be considered outstanding for its focus on speaking practice, though it is not the first choice of both university teachers and educators of young learners due to the course's orientation to the older audience and its lack of academicism [5].

Another issue with teaching speaking is common for all foreign languages. Acquiring a new language takes a lot of time, which is always limited in terms of an academic setting. In the case of Japanese, the situation is complicated by the necessity of mastering 3 writing systems absent in western languages (hiragana, katakana signs and 2136 kanji established by the Japanese government as a norm for school students), getting used to subject-object-verb (SOV) grammar and learning new vocabulary together with its pitch accent.

The reasons listed above lead to the fact that in many institutions the training of speaking in Japanese classroom is either overlooked or left for students to train in their free time. As a method of simplifying and making this training more engaging and motivating virtual assistants can be introduced. **The purpose of the research** was to explore the ways of using the technology of virtual assistants to reenforce speaking performance of the beginner students in Japanese as a foreign language and to evaluate the technology's readiness for integration.

Methodology. Virtual assistants, or intelligent personal assistants (IPA), belong to the sphere of machine learning technologies, that due to the use of voice recognition and natural language processing can in some situations replace a teacher or a native speaker of a target language, therefore it can be used as a tool for enriching language learning. This opportunity was tested by a few educators and researchers and was described in several scientific works [6–9].

A.N. Al-Kaisi, A.L. Arkhangelskaya and O.I. Rudenko-Morgun examined the usage of the Russian voice assistant "Alice" by university students learning the Russian language in terms of the "inverted class" blended learning technology. Students participating in the study gave positive feedback, noted that "Alice" gave different reactions to the same questions, which made it interesting and motivating to converse with the robot and to get to know its character better. At the end of the research participants successfully passed the exam in Russian, so the results of the study showed the didactic potential of this voice assistant [10].

At the same time, in the article "Evaluating intelligent personal assistants for L2 listening and speaking development" G. Dizon examines whether a group of English learners would benefit from training with the IPA Alexa and states that though the difference in speaking results between the control and the experimental groups was not significant, "the fact that the latter made gains in L2 speaking highlights the potential of IPAs to support foreign language development", which is especially important for learners who would normally lack speaking possibilities outside the classroom [11].

Tzu-Yu Tai and Howard Hao-Jen Chen also share positive results of implying the technology of virtual assistant (Google Assistant) in the process of training speaking skill, listing such benefits as extra exposure to authentic native speech, learner-centered approach, immediate feedback from the robot, added opportunity of collaborating with classmates in a new joyful way [12].

Virtual assistants truly have a potential to help students feel more comfortable when acquiring a new foreign language. In terms of limited time available for training speaking in class many beginner leaners feel uncomfortable and insecure about their performance. Virtual assistant can help them train and unlike a language teacher it will repeat its reply as many times as needed, will wait for student's response if necessary and will not lose its cool, which will relieve learner's stress about making mistakes or being slow.

In the case of using Google Assistant in the education process for training speaking skills, students can benefit from the following factors.

1. Cheap price (one can easily download the application from Play Market for free).

2. Availability (in general statistics show that 90% of American children from 4 to 11 years old have access to virtual assistants, so students are usually already familiar with this technology).

3. It can be used at any time and in any place with Internet connection.

4. There are no technological difficulties when using it.

5. No safety net in the form of asking in native language. Usually in classroom all students and a teacher are Russian native speakers, so students can either try to fool a teacher by switching to Russian to avoid making mistakes or start using Russian with classmates. Google Assistant removes this "crutch" as it can be adjusted to operating only in Japanese and not answering to commands in other languages. In this research students were asked to choose only the Japanese language in the settings during the installation.

Though most studies investigating use of virtual assistants are performed in the sphere of the English language learning, G. Dizon, D. Tang and Y. Yamamoto conducted research about using IPA Alexa by advanced learners of Japanese at the JLPT level N2 (which roughly corresponds to the CEFR B2 level). The participants used Alexa at home for their self-directed learning and entertainment. The results showed that the most difficult stage for students was the beginning as they sometimes felt lost as Alexa did not get their message immediately, and they had to learn ways how to communicate with it affectively. Overall, the reaction of participants to the implication of Alexa to their studies was positive as they felt motivated and were grateful to have a chance to use their speaking skills with a partner that gave them quick feedback to what they have said [13].

It is likely that by the time students achieve N2 level, they already have obtained high level of language knowledge and would be able to successfully maintain a dialog with a virtual assistant and resolve communication breakdowns. That can provide a challenge to beginner Japanese learners, who feel especially vulnerable at that stage as they can be unsure if it is possible for them to participate in a real conversation in Japanese. In context of Google Assistant, it leads to the following questions:

1. Can beginner Japanese learners communicate with Google Assistant, understand its speech, and be understood?

2. What kinds of activities can Google Assistant provide to beginner Japanese students?

3. What will the students' experience of using Google Assistant for training speaking be like?

To find it out, a pedagogical experiment was held in the School of Young Philologist at the Faculty of Philology of Lomonosov Moscow State University from December 2021 to April 2022 and then in September 2022. Within the framework of the experiment, 12 first-year students of Russian and Ukrainian origin (10 female and 2 male), who were taking part in the basic course of the Japanese language, used Google Assistant as a part of doing their homework. Unlike G. Dizon and colleagues' study, in this research students were not asked to communicate with Google Assistant on consistent basis but were periodically given clearly defined instructions and tasks that they had to perform with the help of Google Assistant as a part of their individual home assignment. The long period of the study facilitated the studying curve as students had enough time to familiarize with the technology, and the teacher's instructions in the form of an algorithm how to operate with the IPA acted as a safety net.

Results and discussion. At the beginning of the training students were asked to download Google Assistant on their phones and disable all languages except Japanese, so the application would not switch to Russian or English and they could get the "raw" feedback.

Students reported that they mostly did not have problems with being understood, except for one occasion described below. However, it is worth noting that they were mostly performing according to a pre-designed algorithm and tasks tested by a teacher in advance. As for understanding Google Assistants' speech, students said that though its speech felt difficult, they could "catch the main idea by identifying the most important words" and perform the task by both listening to the IPA's answer and looking on the provided image.

One problem some students encountered when using Google Assistant was that the technology failed to recognize their pronunciation of the sound /u/. It can be explained by the fact that though Japanese, Russian and English all have sound /u/, all languages have forms that slightly differ in pronunciation. This "failure" was used as an opportunity to make students pay closer attention to these differences, as in class a Russian-speaking teacher may sometimes overlook imperfections in pronunciation, while IPA will be stricter and more objective.

The framework of the experiment was organized in the way that after acquiring a new topic or new grammar, students were given a task to finish which they had to communicate with Google Assistant using the newly learned material.

The types of tasks were divided into several categories.

1. *Asking for data.* Students must ask Google Assistance some information and then present it to a teacher in a written form with an added screen from the application. For example, this exercise could be used after finishing the topic about transport: students train vocabulary of different types of transport and ask the IPA, how they can get to a certain place using this or that transport and how much time it will take (Figure 1).

A task can be given to students after memorizing Japanese words for the main country names and learning how to talk about time: students ask the IPA what time it is now in different countries of the world. In the experiment students were told that Google Assistant has a different format of presenting time from what they studied in class, so they were motivated to find out what it would be like (Figure 2).

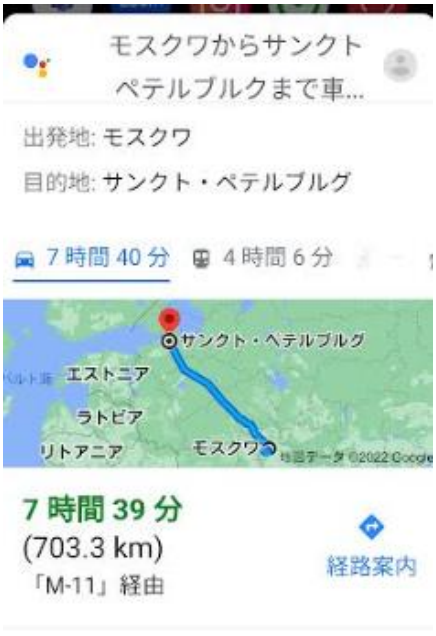

Figure 1. Screen of Google Assistant showing how much it will take to go from Moscow to St. Petersburg

Figure 2. Screen of Google Assistant answering to a question "What time it is now in Tokyo"

2. *Giving instructions.* Tasks about instructions are given to students when they master to the grammatical theme "te-form" in Japanese. Verbs in te-form combined with "*kudasai*" (*shite kudasai*, please do) are used to make a command. In this context students can now ask Google Assistant to help them to organize their everyday life, by putting on reminders, alarms (Figure 3), adding items to a shopping list (Figure 4) and opening it in a shop, calling someone's number, etc.

3. *"Wishlist"*. Then, when students learn grammar *~tai* (*shitai desu*, I want to do something), they are asked to think about what they would like to do with the help of Google Assistant. They can say *aisukuri-mu ga tabetai desu* (I want to eat ice-cream), so the app will show the closest shops with ice-cream (though it was identified that Japanese Google Assistant is unfamiliar with many locations in Russia, even in big cities like Moscow), or ask to turn on music or sounds of rain (Figure 5).

Though this set of tasks does not differ much from tasks with instructions, it has a potential of activating students' linguistic curiosity and lead to the discussion of politeness in Japanese. When introducing the grammar *~tai* to students, it is usually discussed that though according to textbooks it is only allowed to use particle *ga* with it (a*isukuri-mu ga tabetai desu*, I want to eat ice-cream), in real-life Japanese people sometimes use particle wo (*mizu wo nomitai desu*, I want to drink water), so students are encouraged to perform their own experiment using

Google Assistant as a native speaker to observe how it reacts to both variant. In addition, it is important to draw students' attention to the fact, that though Google Assistant as a robot can answer to such phrases as *mizu ga nomitai desu*, I want to drink water, Japanese native speakers culturally prefer ambiguity and round-about, vague ways of saying things, so it is advisable to express the same idea with phrases like *mizu ga nomitai n desu ga*, which can be roughly translated as "I would like to drink some water…". This sounds less direct and puts less pressure on the interlocutor.

Figure 3. Screen of Google Assistant when asked to set a reminder with a specific date

Figure 4. Screen of Google Assistant when asked to add eggs to a shopping list

Figure 5. Screen of Google Assistant when said that one wants to listen to rain sounds

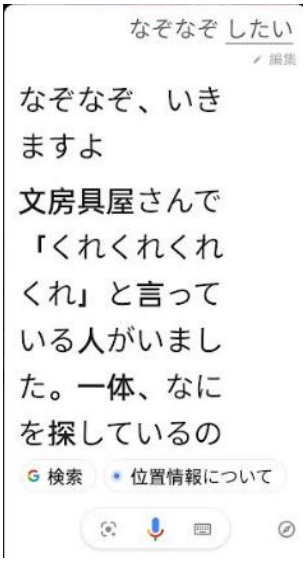

Figure 6. Google Assistant's screen with a text of a riddle

Another idea for tasks about expressing wishes is to ask Google Assistant to play *nazonazo* – riddles (Figure 6). Google Assistant pronounces and shows the text of the riddle, and then tells an answer. Each time students ask to play riddles they are given different puzzles, so then can choose the most interesting and then present it in the classroom. However, it was found that since Japanese riddles of Google Assistant are made for native speakers, they have vocabulary that can present a challenge to beginner learners, so this task was given separately to the same group of students during September of their second-year studies. By that time, they got used to using the technology, using Japanese dictionaries, and had sufficient knowledge of grammar and vocabulary. Even then students reported that this task was particularly challenging, and they managed to guess only the easiest ones, however, overall, they enjoyed this task.

4. *Dialog with a robot*. Though it is believed that communication with a virtual assistant is more like "speaking to a machine, not with a machine" [14], the research made by A.N. Al-Kaisi, A.L. Arkhangelskaya and O.I. Rudenko-Morgun about using the IPA "Alice" showed that the program "has certain character traits, which makes her an interesting and lively interlocutor" [10].

So, as a part of a home task about the topic "Future and technologies" students were asked to work with Google Assistant and make a portrait of its character in a written form. To do so they could ask questions about its age, family, hobbies, if it wears clothes, observe its reactions to complements (Figures 7, 8).

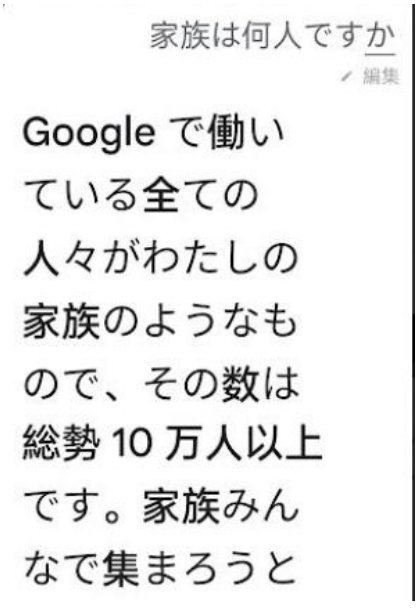

Figure 7. Google Assistant saying it considers all people working in Google its family

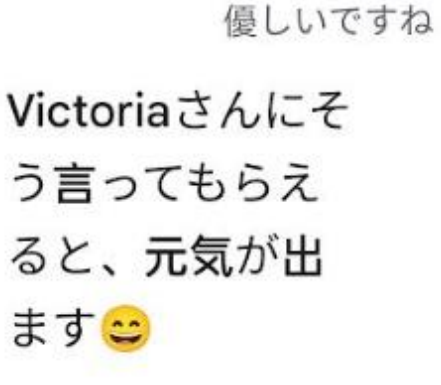

Figure 8. Google Assistant reacting to complements in a polite manner

One of the problems identified is Google Assistant's misunderstanding and unfamiliarity with Japanese names of Russian small geographical places (cities) and geographical disposition of local facilities. Foreign geographical names are translated in Japanese using katakana, so pronouncing a name of a Russian city in Japanese without checking it on the Internet in advance has a high risk of posing

a problem for beginner learners. Usually when asked to identify the closest cinema or shop to a student's location, Google Assistant would refer to popular tourist attractions, therefore failing to accomplish the task. So, it is necessary for a teacher to provide students with a list of Japanese katakana names of their cities and the main geographical objects understood by Google Assistant. In some cases, it was decided to exchange doing the task with Google Assistant to doing it in class with a teacher.

Conclusion. The experiment showed positive prospects of integrating virtual assistant Google Assistant in the process of teaching speaking to the beginner learners of the Japanese language. The results of the research revealed that when directed by teacher's instructions beginner learners of the Japanese language can successfully communicate with Google Assistant individually and complete tasks with its help at home.

Tasks with the IPA were usually given after acquiring a new grammar construction or a set of vocabulary. The types of tasks were divided into four groups:

1. Asking for data.
2. Giving instructions.
3. "Wishlist".
4. Dialog with a robot.

Students gave positive feedback and felt grateful to have an opportunity to check their new skills with someone close to a native speaker. Some of the tasks were considered of higher difficulty (riddles in Japanese), and the students' approach to that was to try to solve many riddles, concentrate on the easiest ones and share them with groupmates.

There was identified a problem related to Google Assistant's unfamiliarity with Japanese names of Russian small geographical places (cities) and geographical disposition of local facilities. The large size of Russia and the fact that there are other popular existing map applications (Yandex Maps) used by Russians instead of Google services may be connected to Google not filling this gap quickly enough. It would be worth examining if this problem will be solved in the future and if it exists in versions of Google Assistant from other countries.

This study bolsters the limited body of literature about usage of virtual assistants for teaching foreign languages other than English. However, it must be noted that though students of the group participating in the research do not reside in Japan and practiced speaking only with their teacher, they had long exposure to listening practice and had basic training of Japanese pronunciation rules (pitch accent) from the early stage of their learning, which is usually done limitedly and only in the third year of university education, so they naturally benefited from a strong start. Therefore, it would be worthwhile to conduct a future IPA study involving L2 Japanese learners without prior pitch accent knowledge performed in a larger group of participants.

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Bio note:
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