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Ensayos

Dificultades que impiden la competencia comunicativa del español como Lengua extranjera, a estudiantes japoneses

Difficulties that prevent the communicative competence of Spanish as a foreign language, to Japanese students

Dificuldades que impedem a competência comunicativa do espanhol como língua estrangeira, para estudantes japoneses

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Resumen

En un mundo globalizado, el intercambio académico y científico, el flujo migratorio, el interés por el conocimiento de la lengua y las culturas de los continentes americano y europeo han motivado a las universidades de diferentes países a establecer el idioma español en sus instituciones, como es el caso de Japón. Sin embargo, existen limitaciones que impiden que se desarrolle en los estudiantes la competencia comunicativa de dicha lengua. Por ello, el objetivo general de este texto es analizar cuáles son estas limitaciones en las universidades japonesas, con la intención de ofrecer soluciones viables como resultado de la indagación.



Para lograr este objetivo, bajo el paradigma interpretativo, se empleó el método de análisis cualitativo a través del estudio de caso, que ofrecen la experiencia de los docentes, así como la bibliografía consultada acerca de las limitaciones que enfrentan dichos estudiantes. Como resultado, se pudo detectar que existen tres obstáculos fundamentales: la tendencia a priorizar el método gramática-traducción en las clases de ELE (*español como lengua extranjera*), los espacios físicos con grupos numerosos y, por último, la postura de la educación japonesa en cuanto a la preferencia por la evaluación mediante exámenes. Como conclusiones, se valoraron propuestas de intercambio internacional, mayor empleo de la tecnología, así como cambios en el paradigma de la enseñanza de ELE como lengua extranjera en Japón.

Palabras clave: competencia comunicativa, español como lengua extranjera, estudiantes japoneses, limitaciones, universidades japonesas.

Abstract

In a globalized world, the academic and scientific exchange, the migratory flow, the interest in the knowledge of the language and the cultures of the American and European continents have motivated the universities of different countries to establish the Spanish language in their institutions, as is the case of Japan; however, there are limitations that prevent the communicative competence of said language from developing in students. Therefore, the general objective of this text is to analyze what these limitations are in Japanese universities, with the intention of offering viable solutions as a result of the investigation. To achieve this objective, under the interpretative paradigm, the qualitative analysis method was used, through the case study, which offers the experience of teachers, as well as the bibliography consulted about the limitations faced by said students. As a result, it was possible to detect that there are three fundamental obstacles: the tendency to prioritize the grammar-translation method in ELE (Spanish as a Foreign Language) classes, physical spaces with large groups, and finally, the position of Japanese education, regarding the preference for evaluation through exams. As conclusions, proposals for international exchange, greater use of technology, as well as changes in the paradigm of teaching ELE, as a foreign language, in Japan were evaluated.

Keywords: communicative, competence, spanish as a foreign language, japanese students, limitations, japanese universities.

Resumo

Em um mundo globalizado, o intercâmbio acadêmico e científico, o fluxo migratório, o interesse em aprender a língua e as culturas dos continentes americano e europeu têm motivado universidades de diversos países a estabelecerem a língua espanhola em suas instituições, como é o caso do Japão. No entanto, existem limitações que impedem os alunos de desenvolver a competência comunicativa dessa língua. Portanto, o objetivo geral deste texto é analisar quais são essas limitações nas universidades japonesas, com o intuito de oferecer soluções viáveis como resultado da investigação. Para atingir esse objetivo, sob o paradigma interpretativo, foi utilizado o método de análise qualitativa por meio do estudo de caso, que oferece a experiência dos professores, bem como a bibliografia consultada sobre as limitações enfrentadas pelos referidos alunos. Como resultado, foi possível detectar que existem três obstáculos fundamentais: a tendência de priorizar o método gramática-tradução nas aulas de ELE (espanhol como língua estrangeira), os espaços físicos com turmas grandes e, por fim, a posição do japonês educação quanto à preferência pela avaliação por exames. Como conclusões, foram avaliadas propostas de intercâmbio internacional, maior uso de tecnologia, bem como mudanças no paradigma de ensino de ELE como língua estrangeira no Japão.

Palavras-chave: competência comunicativa, espanhol como língua estrangeira, estudantes japoneses, limitações, universidades japonesas.

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Introduction

The most widely taught and studied foreign language in Japan is, as in many other countries, the English language. However, the teaching of Spanish as a foreign language (ELE) is carried out as part of regular education, in many cases in universities and, to a lesser extent, in secondary education institutes (Hasegawa and Mizuguchi, 2016). Despite this, for many Japanese, university is almost the only opportunity to learn languages other than English, apart from language academies or self-study; and Spanish is no exception.

One of the most worrying problems that Japan is currently facing, in the educational field, is the tendency to increasingly reduce the diversity of foreign languages that are taught and focus only on the English language. This neglect for the diversity of teaching other foreign languages is not only due to a widespread attitude in Japanese society of prioritizing

English, but also to methodologies for teaching other languages, which differ from the aforementioned.

Due to the analysis carried out, this article addresses these limitations of the teaching of foreign languages other than English in Japan. To examine the problems, we will take the teaching of Spanish as an example.

In this regard, according to Badillo Matos (2021), he points out the methodology as one of the concerns that exist in the teaching of Spanish in Japan. Quoting Rubio Martín (2011), this author indicates that the Grammar-Translation method "continues to be the method used by a large part of the Japanese teachers in charge of teaching Spanish" (p. 128), although they have changed, to a certain extent, the practices of didactics.

Other authors such as Sanz, Escandón, Romero, Ramírez and Civit (2015) criticize that language teaching in Japan is highly focused on grammar and the written word (p. 24). In addition, Badillo Matos (2021) points out that the teacher's methodology is, in turn, conditioned by the fact that historically it has been Japanese teachers who, in Japanese and with Japanese books, have taught foreign languages in the country, with the secondary support of native conversation teachers (p. 128).

On the other hand, Moreno (2022) highlights several challenges of teaching Spanish in Japanese universities (pp. 259-265) and highlights, above all, "the lack of motivation" (p. 264) of ELE university students, in addition to the fact that "the educational tradition gives them a more passive role" (p. 265). Due to these elements, university students "are afraid of making mistakes" (p. 264) and "are rather analytical, they prefer to listen rather than speak and feel uncomfortable if they are forced to intervene, influenced by the educational tradition which gives them a more passive role" (p. 265).

Based on these discussions of the background studies, this article argues that the lack of autonomy of university students when choosing Spanish as their second foreign language is one of the reasons why the traditional methodology is preferred, the Grammar-Translation, in most classes. As viable solutions, we present some practices being carried out by professors at Japanese universities.

Development

One of the limitations that, from our point of view, directly affects the development of two of the skills of the Spanish language: listening comprehension (passive) and oral expression (active), is the tendency to favor the method of Grammar-Translation in ELE classes.

Although it is not possible to generalize due to the experience of the faculty who teach foreign languages and are part of this essay, many universities offer classes in foreign languages other than English as a core liberal arts course, most of which they are mandatory. Within this framework, classes are usually held once or twice a week with a couple of teachers: a native speaker and a Japanese speaker for grammar practice, for example.

In this regard, regarding the teaching method of ELE and the programs, in grammar classes, the teacher focuses on explaining mainly grammatical content; while, in the conversation practice, simple oral exercises are carried out, or conversation practices in pairs (simulations) or in groups, which does not allow skill with authentic material or everyday life situations in a Spanish-speaking country, as well as the variants of the colloquial and informal speech, but it is emphasized in the formal speech, which appears in the textbooks or manuals for its exercise.

This is why teachers, in many cases, use textbooks published in Japan. Most of them consist of lessons containing grammar explanations; the dialogues and activities are related to each grammar topic. Therefore, while grammar teachers tend to limit themselves to explanations of this competence, conversation teachers demand communicative activities from their students, which creates certain conflicts about the reasons for learning this language, such as: which competence prioritize, how to relate the skills to achieve effective and efficient communication in ELE.

Regarding the above, Kakihara, Kamiya and Terao (2018) point out that teachers cannot avoid, to a certain extent, the traditional method of Grammar-Translation, because the linguistic differences are enormous between Spanish and Japanese.

Regarding the reasons for choosing this language, despite these strategies, according to a survey carried out by Hirai and Tsukahara (2014), university students who decide to study Spanish answer that they choose it because they are interested in the culture of the

Hispanic world, they want to visit these countries, communicate with the people of this culture. Some say they are interested in soccer, or think that knowing this language will be useful to them in the future, among other reasons.

Other students respond with passive motivations, such as “because it is a required elective”, “because it is necessary for graduation or to obtain necessary credits”, or “because it is easy to pronounce (if they have to study a foreign language). anyway)”. These authors point out that the most common responses are found in the position: "interjuncted regulation" in the "Self-determination theory" analysis. This means that they choose this language because they have to study it or they don't want to be embarrassed (without studying it) (p.24). This limitation is due to the positioning of foreign language subjects in each specialty curriculum. As Badillo Matos (2021) indicates, "Despite the deregulation of the university curriculum in 1991, learning a second foreign language is still mandatory in almost all universities" (p. 122).

What to do in the face of these limitations? What would be the feasible proposals? From our perspective, for the first limitation: the methodology and the programs, a more realistic solution would be to change the Syllabus that aims to cover all grammatical points, to one that focuses on communicative situations and the promotion of skill. -Oral expression capacity: dedicate more time to practice, carefully selecting the grammar points to teach, based on a pedagogical grammar (Diez Irizar, 2020) in which communication is addressed with the grammar necessary for the communicative situation being studied . Starting from these ideas, there have been some attempts to publish new textbooks since the beginning of the first decade of the 2000s.

Some books focus on communicative activities; while others opt for the Situational Syllabus, study plans based on communicative situations.

Teachers have also tried to apply new methods to their teaching practice and to introduce new assessment methods as well. In recent years, Learner-centered, learner-centered methods have attracted a lot of attention, and recently foreign language teachers have made an effort to incorporate Project-based Learning into their teaching. Carrying out these activities in the classroom requires new forms of evaluation, such as the use of rubrics.

Given the above approach, the influence of the CEFR (Common European Framework of Reference for Languages) is also valuable in Japan, and the introduction of Lasitas “Can-Do” has been suggested to establish specific learning objectives. For this reason, the

works of Omori, Misumi, Moreno and Ochiai (2017-2020) should not be ignored, as examples of attempts to establish the goals and objectives for the teaching of Spanish in universities. Likewise, that of Ezawa (2010) who studied the possibility of applying the CEFR and Curricular Plan of the Instituto Cervantes to the teaching of ELE, aimed at Japanese learners in Japan; and, finally, Sunden (2010) who proposed to standardize the contents of the teaching of Spanish in Japan, although at the same time, points out the difficulties of the direct application of the CEFR since this situation differs from the European one. Taking into account everything that has been discussed, alternatives must continue to be sought that can make the teaching of ELE more effective and dynamic.

In addition to the conditioning of the methodology, the teaching of foreign languages in Japanese universities has another important limitation. It is about the physical spaces: classrooms. According to MEXT (2020) data, 54.4% of Japanese young people who finish high school (the upper secondary education: Kotogakko) go on to study at university, for an average of 2,426,000 students enrolled . With the universalization of higher education, the student body has diversified. For this reason, the numbers of students in foreign language classes -which in many universities are compulsory subjects- tend to be numerous. In the cases of ELE, for example, the number oscillates between 35 and 40 students in each classroom. Because of this, interactions between teacher and student are usually reduced, as well as student-student.

In many cases, the classrooms for language classes are conventional, with fixed desks, which can accommodate many students. This condition only favors teaching centered on the teacher (teacher-centered approach), who transfers knowledge in a unidirectional way: from the teacher to the student. Likewise, ELE teachers choose to use traditional materials, such as textbooks and blackboards.

However, most Japanese universities have computer rooms, equipped with computers connected to the Internet, but these are not always used for language classes. And although, in some cases, these physical limitations caused by the installations in the classrooms are being eliminated (Kakihara, 2020) such as, for example, with sound equipment and a video projector, with mobile tables, to accommodate the active learning, the substitution of traditional rooms for computer rooms are a possible option, because there are no other conditions on the part of teachers, since, as the author points out: there are differences in computer knowledge, even among teachers (p .398).

With respect to possible solutions in terms of overcrowding in the classrooms, the ideal is to reduce the number of students (maximum 20) in each class; In addition, both students and teachers venture into an interactive practice, based on the use of Information and Communication Technologies (ICT).

In accordance with this concept, Kakihara, Kamiya and Terao (2018) and Kakihara (2020) have developed some simple digital tools, which can be used in conventional classrooms, based on the projection of content on the screen that encourages students to speak in class. One of them is a program that displays verb conjugation tables, taken at random.

They have also developed a program that generates multiple-choice questions, as well as another that offers forward and reverse translation (Japanese and Spanish) at the same time. With these programs, students can do grammar exercises, reading activities and translating aloud, having fun in conventional classrooms. Since all these programs use a graphical user interface and Microsoft Excel files as their database, any teacher can create their own database, adding new words and phrases very easily.

In the same way, Kakihara and Terao (2018) have developed a digital tool for the development of oral expression skills, due to the limitations that ELE students have in Japan, since they cannot speak or listen to Spanish outside of the classroom. Therefore, the only Spanish they are exposed to are textbook examples and dialogues, but these are not natural because they are designed to explain grammatical issues.

This tool consists of sentences of a dialogue that plays the sound of the questions and the answers. To create this tool, 106 dialogues that frequently appear in the most used textbooks in Japan have been selected, and the spontaneous reactions provoked by the dialogue questions of Spanish-speaking students have been recorded. By doing these exercises, students become familiar with the variant of Spanish used by native speakers.

These practices have been useful in times of health emergency, caused by the Covid-19 virus, since they were designed to promote oral practices in traditional classrooms and connect traditional methods with dynamic activities. However, we consider that they are not the optimal solutions to the demands of a future Japanese professional, who is passing through the 21st century and ICTs have entered the field of teaching to stay.

Finally, we consider one of the most complicated limitations, which affects the methodology and the motivation of the students. It is about the tradition of the culture of education in Japanese society, specifically the attitude of university students towards learning foreign languages, who give greater importance to evaluation, through exams. . Despite the fact that

they are motivated to communicate in the target language, it is necessary to change the Japanese educational system itself, which prioritizes knowledge assessments based on exams.

This custom of the students is due, on the one hand, to the harmful effects of studying to pass the entrance exams, which are very severe. The same happens in the teaching of English, which has been criticized because it focuses on knowledge of grammar and translation skills, necessary for exams and does not help develop communication skills, it also occurs in the teaching of ELE.

The curricula of teaching English in secondary and primary schools have been changed, as well as communicative activities have been introduced; however, the university entrance exams have not been changed. So even though the teaching of English has changed, students who want to go to university will continue to prioritize the knowledge they need for exams.

In addition to the above, many Japanese graduates from universities will be evaluated based on their English certificates and the results of the exams in these tests, as part of the process of recruiting companies. For these reasons, the Japanese tend to think that English is the only important language, and even when they study other foreign languages, such as Spanish, they often do so to prepare for exams.

Therefore, to change the ways of studying languages, it is necessary to introduce changes in the teaching-learning process in Japanese schools, as well as the attitudes towards language teaching that exist in society. In this way, it is necessary to demonstrate that various types of evaluations can be offered that are not exactly exams, to obtain the necessary skills in the knowledge of a foreign language, which allows young people to work in a Japanese company and in the abroad, travel to other countries, participate in language and cultural exchanges, which make it possible for young Japanese to enter the 21st century.

Discussion

For all the above mentioned about the bibliographic consultation, it is necessary to make urgent changes in the attitude towards language teaching, since there are Japanese university students of ELE who lack motivation to study said language. On the other hand, we have seen that teachers cannot avoid the traditional Grammar-Translation method due to the linguistic distances between Spanish and Japanese. We have also pointed out the problems of large groups in the teaching of ELE due to the universalization of higher education.

As solutions to these limitations, attempts have been made to change the Syllabus in the development of teaching materials since 2000, as well as the adoption of new teaching methods such as project-based learning and new forms of assessment such as the use of rubrics. Finally, we have presented a practice of using simple digital tools, which do not require in-depth knowledge or special equipment (Kakihara, Kamiya and Terao: 2018, Kakihara: 2020).

In addition, as a solution to one of the most complicated problems, related to the tradition of the education culture of the society, we have proposed the need to change the nature of language teaching, since it creates the lack of motivation, passive motives and the attitude that evaluates only English as the language of importance. In other words, we have proposed the reconsideration of language tests that emphasize memorized knowledge and the transformation towards how university entrance exams should be.

In this way, one might think that they are abstract and unrealistic ideas, due to the characteristics that we have mentioned before. However, these are very important and urgent proposals because, although in recent years language teaching in Japan seems to be changing with the introduction of the CEFR, there is a tendency to consider the proficiency levels it offers as a new standard, or as a certificate of knowledge or a kind of degree.

Kakihara (2009) argues that the CEFR introduced proficiency criteria that can be compared between different languages, and concern is directed towards how teachers and students perceive them as knowledge achievement criteria for each language. Therefore, it is feared that this could encourage the learning of prestigious traditional languages such as English.

This concern is becoming a reality in Japan. For example, the Ministry of Education, Culture, Sports, Science and Technology (MEXT), when introducing the CEFR as a reference framework for the teaching of English, developed a comparison table with the clear purpose of using it as a standard to compare the levels of various certification tests¹ and, in doing so, reinforced the attitude of emphasizing exams and evaluating the English language as the most important language among Japanese people. Therefore, the proposals in this essay are of great urgency and are addressed to Japanese policy makers and society in general.

Conclusions

As it has been possible to verify, from the qualitative study based on the research carried out in Japan, the teaching of ELE is taught in many universities, but the proportion of these that offer this language is slightly disproportionate, like other languages, if we take into account the number of students enrolled in social education centers.

Reference has been made to several limitations: the conservative tendency to favor traditional methods, the limited condition of university classrooms, as well as the perspective of society towards foreign languages in Japan, and Spanish is no stranger to this. In the same way, some solutions have been offered, from our point of view, although we are sure that they are not enough for a student in the Knowledge Age.

The problem that is presented in this essay, about the methods and ways of carrying out the teaching-learning process of ELE in Japan, presents peculiar characteristics, due to the paradigm that the study programs have established, the do- centes and students from said country.

Although it is true that an eclectic method is currently valid in teaching foreign languages—depending on the context, the students' mother tongue, the interests and motivations of the students, among other aspects—, technologies for teaching and learning offer the opportunity to approach native speakers of the target language, regardless of where they are. Therefore, knowing the technological skills that teachers and students possess will facilitate the creation of favorable learning environments, not only for Spanish, but for any other language.

In the same way, learning environments are diverse; It is no longer just the classroom—despite having numerous students—, since there are other spaces to learn, such as: mobile applications, various pages or educational platforms that achieve a rapprochement between learners, based on the exchange with the culture of the target language. In this case, motivation will be the center of attention of the teachers in charge of this task in ELE, ensuring that learners find in these spaces a way to practice and exchange, without the need for a level exam.

The spread of the pandemic, generated by Covid-19, has shown that universities must venture into other alternatives, mainly with the use of technologies that allow Japanese students to carry out virtual exchanges, use educational platforms and the use of networks social,

with students and teachers from Spanish-speaking countries, to achieve the development of productive skills: oral expression and writing, with native Spanish speakers.

Finally, that Japanese universities establish international exchange programs that favor students and also teachers, to practice and develop Spanish language skills, as well as access technology that, with the pandemic, allows us to It has forced us to reflect on the new language teaching programs.

For all of the above, it is considered that there are two lines of research that can contribute to the scope of this problem: the first, directed towards educational technology, as a platform in which the practice of skills is promoted. of ELE, with the intention of implementing updated methodologies; and the second, focused on intercultural exchanges with other Spanish-speaking countries, which allows interaction between teachers —with other teaching perspectives— and students to strengthen Spanish skills, as a foreign language, in Japan.

References

- Badillo Matos, A. (2021). *Lengua y cultura en español en el Japón de la era Reiwa*, Real Instituto Elcano.
<https://www.realinstitutoelcano.org/wp-content/uploads/2021/01/badillo-lengua-y-cultura-en-espanol-en-japon-era-reiwa-1.pdf>
- Diez Irizar, G. A. (2020). *Implementación de un Diseño Instruccional de un curso en línea para el desarrollo de la competencia gramatical en lengua española*. [Tesis de doctorado no publicada]. Centro de Estudios Universitarios Mar de Cortés.
- Ezawa, T. (2010). YoroppaKyotsusansyowakutoSerubantesuKyokai no KarikyuramuPuran: Nihon no SupeingoKyoiku e no Oyo: Aplicaciones del MCER y del PCIC a la enseñanza de ELE en Japón. *HISPÁNICA, Asociación Japonesa de Hispanistas*, 2010 (54), 211-232. <https://doi.org/10.4994/hispanica.2010.211>
- Hirai, M. y Tsukahara, N. (2104). *Daigaku ni okeruSupeingogakusyudoki ni kansurukijututekibunsekiHokoku*. Informe sobre un análisis descriptivo de los motivos para aprender español en la universidad., Informe sobre los resultados de un proyecto de investigación encargado y financiado por el Ministerio de Educación, Cultura, Deportes, Ciencia y Tecnología. AtarashiGengokyoikukan ni motozuitafukusu no gaikokugokyoiku de shiyodekirukyotsugengokyoikuwaku no

- Sogokenkyu. Investigación general sobre un marco común de enseñanza de idiomas que puede utilizarse en la enseñanza de lenguas extranjeras basadas en una nueva visión de la enseñanza de idiomas, dirigida por Nishiyama Nobuyuki, pp.20-28.
- Kakihara, T. (2009). *¿Qué impacto puede tener el MCER en las lenguas regionales y minoritarias?*, Syakaigengogaku, IX, SyakaigengogakuKankokai, pp.175-194.
- Kakihara, T. (2020). *El uso práctico de banco de datos en la clase de ELE*, [Presentations de paper]. VIII Congreso de Hispanistas de Asia. Monográfico Sinoele, 20. http://www.sinoele.org/images/Revista/20/Monografico_AAH_2013/SinoELE_20_2020_AAH_2013.pdf
- Kakihara, T., Kamiya, K. (2018). *The development and use of database in the conventional classrooms of Spanish*, [Presentations de paper]. WorldCALL 2018, Concepción, Chile. https://issuu.com/zentidos/docs/pg_book_with_abstract_index_wc2018
- Kakihara, T., Terao, M. (2018). El desarrollo de una herramienta digital para familiarizar a los estudiantes con el español natural. En P. TaboadadeZúñiga-Romero, & R. Barros-Lorenzo. (Eds). *Perfiles, factores y contextos en la enseñanza y el aprendizaje de ELE/EL2, XXIX Congreso Internacional de ASELE*. pp. 481-497. Universidad de Santiago de Compostela. <https://dx.doi.org/10.15304/9788417595487>
- MEXT (2020). *Reiwa 2 nen Gakkokionchosa (kakuteichi) no kohyo ni tsuite* (Publicación de la Encuesta Básica de Escuelas 2020 (cifras definitivas)), https://www.mext.go.jp/content/20200825-mxt_chousa01-1419591_8.pdf
- Moreno García, C. (2022). *Enseñar ELE en Japón*, en Méndez Santos, María del Carmen y Galindo Merino, María del Mar coords. Atlas de ELE, 2 Asia Oriental, Geolingüística de la enseñanza del español en el mundo, 249-275.
- Omori, H., Misumi, A., Moreno, C. y Sae, O. (2017-2020). *Totatsu mokuhyo wo meiji shita supeingo kyoiku no Jissen ni mukete* (Hacia la enseñanza del español como lengua extranjera con objetivos claros), The annual report of the MGU, Institute for Liberal Arts, Meiji Gakuin Daigaku.
- Rubio Martín, R. (2011). *La enseñanza del español en el Japón de hoy, en Japón y el mundo actual*, Zaragoza: Prensas Universitarias de Zaragoza, 2010 [i.e. 2011]. pp. 39-58.
- Sunden, C. (2010). *Nihon no supeingokyoikuniokerujugyonaiyo no hyojunka no hitsuyosei* (La necesidad de normalizar el contenido de la enseñanza de español en japon). GaikokugoKyoiku Forum, Kansai University, 9. 53-66. <http://hdl.handle.net/10112/9545>

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