The potential of the metaverse in hybrid language training: towards an innovative, interactive and social device

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Abstract.

In the context of hybrid language teaching, teachers can supplement face-to-face classes by providing learners with a more immersive and personalized learning experience via the Metaverse. This can assist learners in interacting, communicating, and working on collaborative projects with other students. However, the Metaverse and its current components call into question teachers' knowledge and pedagogical practices, raising new questions, particularly about how the Metaverse will enrich language teaching. Indeed, the use of the Metaverse in language teaching is evolving slowly, raising many questions about its contributions and limitations. Our research serves two functions. First, we'll go over the Metaverse's benefits and drawbacks for language teaching. Our research serves two functions. First, we'll go over the Metaverse's benefits and drawbacks for language teaching. The second goal of this research is to investigate stakeholders' perceptions of the Metaverse's use: Can students better interact in these virtual worlds? Does the Metaverse open up new pedagogical possibilities for language teachers? A questionnaire about the Metaverse was distributed to 124 language students and 23 language teachers for this purpose. We were able to investigate stakeholders' perceptions of this virtual world by analyzing the collected data.

Keywords: Metaverse, language teaching, innovative device, hybrid teaching

Introduction

Language training is expected to change as the Metaverse evolves. This transformation, which we are witnessing, affects all aspects of training, including the design of digital resources, content dissemination, teacher and student roles and practices, student support methods, and even teacher-student relationships. In fact, according to a Gartner (2022) study, 25% of people will spend an hour per day in the Metaverse by 2026. As (Basdevant, François, Ronfard, 2022) points out, we often refer to the Metaverse as "a concept encompassing several immersive technologies such as augmented reality and virtual reality." A Metaverse is an online service that provides access to shared and persistent real-time 3D space simulations in which people can share immersive experiences." The use of the Metaverse in language teaching at the university level is growing, but it raises many questions about its contributions and limitations in language teaching. The purpose of this article is to investigate the perceptions of actors (both students and teachers) regarding the use of the Metaverse. Can students interact more effectively in these virtual worlds? Does the Metaverse improve social interactions in language classrooms? On the teacher side, does the Metaverse open up new pedagogical avenues for language educators? Where are we in the design process? From the perspective of language teachers, what are the main constraints to the deployment of the Metaverse in language teaching? What skills must language teachers acquire in order to successfully implement the educational Metaverse?

In the first section of this article, we will define the metaverse, its components, how it works, and how it can be used to teach languages. The field and analysis framework within exploratory research on the use of the Metaverse with 124 undergraduate and graduate students from the Faculty of Sciences Ben M'Sick and 23 teachers will be presented in the second part. We asked students and teachers to complete a questionnaire about the Metaverse. We were able to discover the actors' perceptions of this virtual world by analyzing the collected data. Finally, we will make a few recommendations for the current state of language teaching. where we are witnessing an unprecedented shift away from in-person language teaching and toward a hybrid mode of instruction that can be enhanced by the use of the Metaverse.

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2. Metaverse and language teaching

2.1 Characteristics of Metaverse

The term "metaverse" was coined thirty years ago in 1992 by science fiction author Neal Stephenson. His novel Snow Crash depicts the metaverse as a 3D virtual world in which people roam, socialize, and interact with each other and AI-generated characters as avatars. The metaverse (from the English metaverse, a contraction of meta and universe, meaning meta-universe) is a virtual world, according to its origin. Indeed, according to Matthew Ball, the metaverse is a "successor to mobile internet with the vision of a single platform for leisure, work, and human existence in general." Metaverses are digital universes that are immersive, persistent, and collaborative in three ways. They are immersive because the learner is the main character in the story. They are also persistent because events take place even when you are not present. Finally, metaverses are collaborative because they have high social value: learners can interact with others (Philippe Cassoulat's book "Metavers, NFT: Decrypting the New World" (Hermann Editions)).

2.2 Types of Metaverse platforms

The equipment required for the metaverse requires significant investment, and only globally scaled companies can implement it. Large network enterprises, as well as GAFAM, are among these companies: Facebook, Microsoft with its HoloLens headset and its Mesh for Microsoft Teams metaverse for meetings, and Microsoft Mesh to create virtual universes; Amazon, Apple, and Google are also said to have projects in the works. Education in a metaverse has the potential to open up new avenues for assimilation. Communicating and immortalizing knowledge in ways that enable better, deeper, and faster learning than ever before. There are a number of early educational metaverses. Second Life, a virtual platform that debuted in 2003, was one of the first metaverses to be used for education. Virtual worlds such as Minecraft and the metaverse Horizon Worlds have also been used to teach concepts such as interaction, collaboration, and communication (see table below):

Table 1. Types of Metaverse platforms

Types of platforms	Description
[Second Life]	Second Life's Metaverse City bills itself as "a welcoming role-playing community" with immersive experiences that allow players to enter and exit as they wish.
[Rooom]	Rooom specializes in virtual corporate showrooms, 3D product presentations and virtual events that can be used by marketing and sales groups in verticals such as education, retail, life sciences and manufacturing.
[Altspace VR]	Acquired in 2017 by Microsoft, the virtual platform enables the creation of virtual events and is part of the tech giant's Mixed Reality division. Users can host a meeting, show or class.
[Meta Horizon]	Meta (formerly Facebook) touts its Horizon metaverse platform as an "ever-expanding social universe" for hanging out with friends and creating your own worlds. Workrooms is the company's mixed reality app for employee collaboration.

2.3 Technologies and equipment used to access metaverse

According to Mark Zuckerberg, the metaverse's leader, the idea is to feel more present in space when connected and to interact more naturally through a virtual reality headset or glasses. Internet users will be able to create their own avatars, which are virtual bodies with a variety of appearances that can be changed as desired. The following items are required to access the metaverse:

- ✓ **Immersive technologies:** Immersive technologies, such as immersion through sight, sound, touch, and machine connection, have enabled the metaverse revolution. Virtual reality has enabled the metaverse to be populated with visuals (avatars and landscapes), allowing for a more personalized learning experience for the learner.
- ✓ **Headsets:** Without a doubt, one of the most important aspects of the metaverse is the visual aspect. The metaverse is primarily based on image processing, which will lead to the advancement of visual research. Oculus headsets, for example, allow learners to immerse themselves in virtual reality while organizing meetings and conducting distance learning. One of the most notable examples is the Oculus Quest 2. It's worth noting that the Oculus Quest 2 is a standalone VR system powered by a Snapdragon 865 processor. The metaverse is multimodal, with access via connected glasses (Ray-Ban has a contract with Meta), screen cabins that allow headset-free use, a computer, tablet, phone, or TV. However, because they are more immersive, headsets are likely to dominate. As a result, it is critical to distinguish between the two main immersion modalities presented by Philippe Fuchs.

- ✓ Exteroceptive immersion through projection into an avatar, also known as "embodiment", is common in video games and classic virtual worlds.
- ✓ Proprioceptive immersion, enabled by virtual reality headsets, allows the user to turn in all directions (360 video, 3DOF VR, cinematic) and move around the simulation space.

- **Avatars:** One of the best parts of the metaverse experience is the avatar options. A metaverse avatar allows the learner to have the appearance they desire in any environment.

The metaverse also makes use of distributed servers all over the world. These servers must be powerful enough to store the virtual world's 3D maps, environments, and objects. This virtual space, as a persistent space, must be logged by recording everything done when adding, moving, or deleting an object.

The "metaverse's" innovative strength stems from the variety of digital tools it provides, which language teachers must use. The application of these tools in language teaching allows for creativity in learning activities. This begs the question: What kind of language learning activity can be imagined in the metaverse?

2.4 Hybrid language training integrating Metaverse

We will take on the definition of a hybrid device from Charlier, Deschryver, and Peraya, which combines various pedagogical modalities, alternating distance learning and face-to-face training. The use of the metaverse in education opens up new possibilities for these hybrid devices by combining face-to-face and virtual space. The dimensions of a metaverse-based hybrid device that can help learners interact, communicate, and work on collaborative projects with other learners are summarized in the model below. This model revolves around the central concept of learning. These dimensions are presented on three levels (as shown in the diagram below):

- Level 1: Innovative device

- Level 2: Social and interactive device

- Level 3: Language learning activities in metaverse and in class.

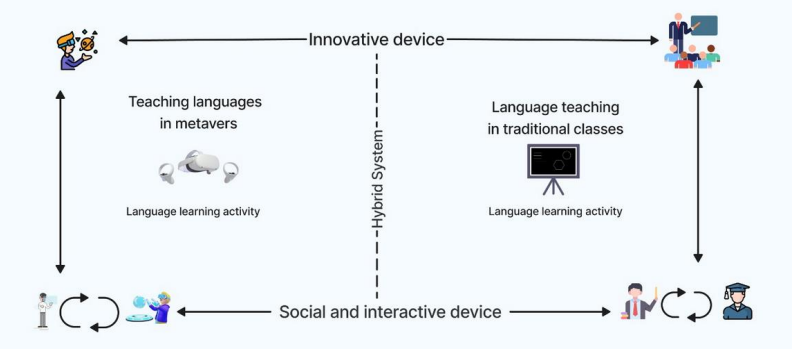

Figure 1. Innovative, interactive and social hybrid language teaching

Innovative device: The model considers the **innovative** dimension to be a metaverse-based process. Teachers can supplement face-to-face classes with hybrid devices by providing learners with a more immersive and personalized learning experience, using pedagogical tools that are not available in the context of traditional face-to-face teaching. As a result, the metaverse paved the way for virtuality and provided users with access to a wide range of new applications and services. It has been observed that an increasing number of metaverse platforms are introducing tools for the creation of learning networks.

Social and interactive: The cultural adoption of the Metaverse owes a lot to Generation Z, who grew up in a mostly digital world. Machines and digital technology are normal elements of these young people's daily lives, whether for learning or exchanging with friends, which develops the social aspect. They have also evolved in their relationship with the Metaverse and digital technologies: they now participate in forums or chats, spend real money on their virtual worlds, and so on. Some learners benefit from metaverse socialization, particularly in breaking their isolation: "socialization" among peers can be a factor in emulation for each student in terms of their progress in their learning journey. The metaverse, thanks to the socialization tools associated with the metaverse platform, allows for enhanced interaction, which encourages students to share their knowledge with others and allows the learner to experience personalized learning. This is accomplished through the selection of the avatar and its own characteristics. The journey of each "metanaut" is meant to be flexible and determined by the student. They may be able to select their own courses and schedules.

Language learning activities in the Metaverse and in the classroom include: Language teachers, for example, at the Faculty of Sciences Ben M'sik, are constantly sharing the anxiety of science students facing the languages (French and English) they must know, the lack of mastery of which is a major handicap for the majority of them. Language teachers believe they do not have the resources or time in a 1.5-hour language session to work on both written and oral skills, which is why they are interested in using the metaverse. Indeed, a 1.5-hour session is insufficient to address all components of language and communication skills: this observation prompted us to consider which activities should be prioritized in face-to-face sessions versus those that could potentially be carried out in the metaverse, as well as their mode of instruction. As a result, an innovative and social hybrid teaching model incorporating the metaverse was developed to meet the needs of Generation Z learners, focusing on new, and more immersive and personalized learning experiences.

Furthermore, in the metaverse, activities can include online games, social gatherings, oral or written language activities, and much more. Preparing a presentation, writing a summary, a synthesis, a report, a scientific report, and so on are examples of tasks that students can or will be able to complete in the metaverse. Students can, in fact, use this virtual space to complete group projects and present them orally. The use of the meta-verse allows language teachers to propose playful activities and role-playing via this virtual space, leaving the task of working on writing, for example, to the classroom.

3. Perceptions of metaverse use in language teaching by teachers and students

The results of our survey will be presented in this section. The two questionnaires will allow us to investigate the actors' perceptions of metaverse' use in language teaching. We will begin by presenting the material and method used, followed by the results obtained.

3.1 Methodology

This research is a survey of the use of metaverses in language education. A methodology was developed to achieve the goal. We were able to identify several recurring representations concerning the use of metaverses for language teaching thanks to the two questionnaires that were distributed to students. This survey was administered in the form of a questionnaire to actors (teachers and students). Given the significance of this study and the extensive survey, a test was conducted prior to the main survey. This was done on 20 students and 5 language teachers to test the content and form of the two established questionnaires and make any necessary changes. Following a metaverse literature review, the two questionnaires were created.

We conducted a research investigation with 124 students from the Ben M'Sick Faculty of Sciences and 23 language teachers from Hassan II University in Casablanca.

The Google Forms tool is used to distribute the questionnaire to students and teachers:

https://forms.gle/B7SHq7QBYmHVPMhK9

(For students)

and https://forms.gle/56avs4JiYYGZzpdV6

(For teachers)

The two questionnaires were divided into three sections:

- General information about the respondent
- General information about the metaverse teaching.
- To assess the metaverse's contribution to language teaching.

3.2 Findings

A- General data about the sample (teachers / students)

The sample of students and language teachers was drawn at random and consisted of 23 language teachers from various teaching cycles and 125 students. The sample is represented by the figures below:

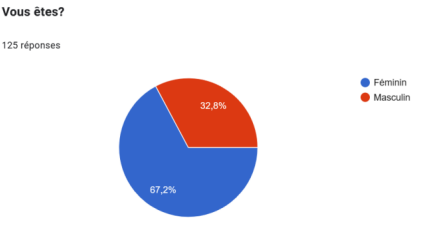

Figure 2: sample (students)

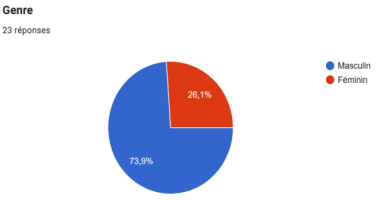

Figure 3: sample (language teachers)

B- Perception of the actors regarding the use of the metaverse (teachers / students)

On the student side:

A-The students' perceived uses of metaverse: Have you ever heard of metaverse? Have you ever used a virtual reality headset?

According to our study, 63% of the respondents have already heard of metaverse. The figure below illustrates the response rate to this question.

The met averse are virtual universes entirely digital connected to the real world allowing to interact with other people; it is possible to practice the same activities as in the real world. **Have you ever heard of the met averse?**

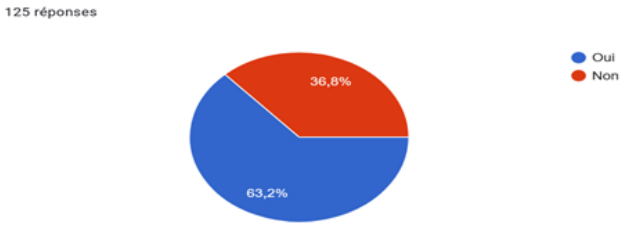

Figure 4: Students are aware of metaverse

83% of students in the study said they had never worn a virtual reality headset. The graph below shows that only 16% of respondents had ever used a virtual reality headset for gaming, and very few geology students have ever used these headsets to virtually view planets.

Have you ever used a virtual reality headset?

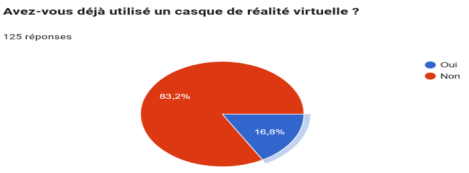

Figure 5: use of the virtual reality headset

B-Metaverse and language instruction (from the perspective of the student): Will the Metaverse-based course improve the atmosphere for learning languages? Do you believe that metaverse-based instruction will improve language learning?

According to the poll results, 85% of students believe that Metaverse will make language instruction more appealing, as seen in the figure below.

Will the metaverse course make the language teaching ?

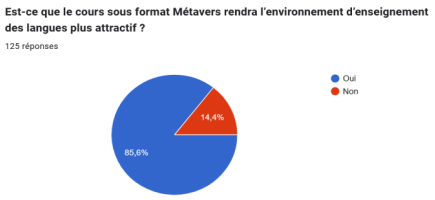

Figure 6: Figure: More attractive language teaching through the use of metavers

The survey revealed that 86% of respondents believe that metaverse will increase the quality of language teaching, as the figure below.

You believe that metaverse-based instruction will improve the standard of language learning.

Figure 7: Quality of metaverse-based language teaching

From the teachers' side:

A. How teachers perceive their usage of metaverse: Do you know what metaverse are? Do you have experience with virtual reality headsets? Do you worry about the rise of virtual online worlds?

The graph below shows that 70% of language teachers are very interested in metaverse and have heard of it.

The metaverse is a fully digital virtual world connected to the real world, where you can interact with other people. It is possible to practice the same activities as in the real world

Figure 8: The language teacher has already heard of metaverse

According to the survey, 65% of teachers have already used a virtual reality headset as part of a training related to virtual reality. This training was organized by the University Hassan II of Casablanca.

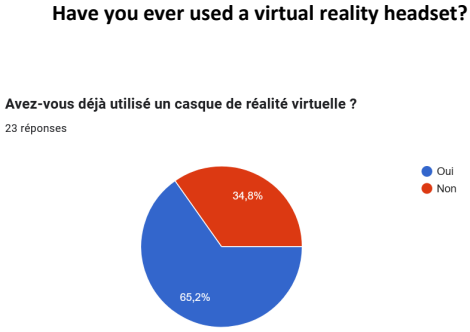

Figure 9: The language teacher has already used a virtual reality headset

In the figure below, the majority of teachers are not afraid of the emergence of digital virtual worlds. Against 13% of the language teachers who consider that the use of the metaverse will diminish the quality of real life and negatively influence the real communication between teacher and student.

Do you have any fears about the emergence of digital virtual worlds?

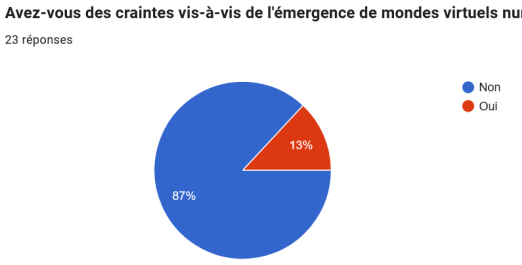

Figure 10: Fears about the emergence of digital virtual worlds

B-Metaverse and language instruction (from the viewpoint of the teacher): Would you be interested in learning a language through the metaverse? Do you believe that a digital virtual environment could help to enhance the caliber of language instruction? What specialized knowledge must language teachers possess in order to properly employ the metaverse in the classroom?

According to the graph below, which shows a high level of interest in the usage of metaverse, more than 80% of language teachers are enthusiastic about utilizing them to teach languages.

Would you be interested in using the metaverse to teach languages?

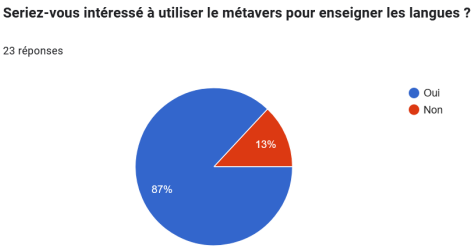

Figure 11: interested in using the metaverse to teach languages

The majority of respondents (91%) emphasized that metaverse could play a role in improving the quality of language teaching.

Do you think that a digital virtual world could play a role in improving the quality of language teaching?

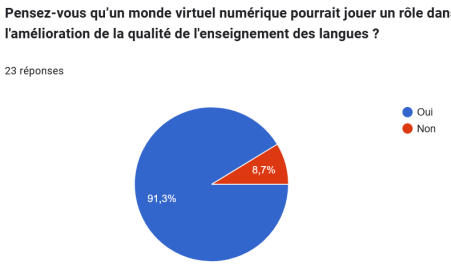

Figure 12: Improving the quality of language teaching via metaverse

The open-ended question "What technical skills do language teachers need to acquire in order to use Metaverse effectively in the classroom?" was analyzed, and it brought to light a number of issues pertaining to the reality of employing Metaverse in language instruction. Language teachers continue to have questions about Metaverse, including what it is, how it will change the way they teach, and what technological abilities they will need to acquire in order to use it.

The majority of educators are unfamiliar with the metaverse's ideas. Many people lack the technological know-how required to operate the meta-verse. As a result, educational institutions must offer a training program that will help language teachers comprehend the elements of the metaverse.

3.3 Discussion

According to some reviews, synchronous language training in the metaverse is significantly more successful than on Meet or Zoom. For instance, a Florida institution developed classes in the metaverse that produced significantly higher containment engagement than what is witnessed via Zoom or Teams. For instance, this university gave learners' avatars a tour of Mars; all of this is really effective in piquing their interest and engaging them. We need to reevaluate the parts that the various actors will play in this innovation in light of the metaverse's integration. It's obvious that in the metaverse, students and teachers will each have a new role to play:

On the student's side

The goal is to help students develop their own learning strategies so they may use the available metaverse tools to interact and work with other students outside of the classroom. The learner assumes control over and a role in their learning process within the framework of this tool. In order to better adapt to the quick-paced metaverse, students should cultivate the core talent of self-determined learning (also known as heutagogy). Heutagogy, in the opinion of Hase and Kenyon, places more emphasis on learning how to learn than it does on encouraging information sharing

On the teacher's side.

By enhancing the manner of accompaniment, the hybrid device modifies the teacher's role. Indeed, the teacher-Avatar-Tutor does not handle the accompaniment solely. The use of the hybrid device that incorporates the metaverse affects the teacher's function by enhancing his style of accompaniment since it progressively shifts the teacher's attention from the contents to the individual students' learning. The teacher-avatar in the metaverse assumes control of the accompaniment. It's crucial to keep in mind that the meta-verse is still evolving, and as technology advances, so could the educational opportunities. To make the most of the use of metaverse in language instruction, it is crucial for language educators to stay current with fashions and adjust to changes.

The benefit of a hybrid device that incorporates metaverse is not on the side of instructional time. More diversified work rhythms, simpler socializing, collaboration, and above important, more individualized language exercises for pupils are all part of the increased educational efficiency.

Thus, the metaverse offers opportunities for language teaching in that it:

- stimulates the development of language competence through a variety of activities (in the metaverse and the classroom)

- modifies the role of the student by developing his/her autonomy

- modifies the role of the teacher (avatar) by developing his method of accompanying students

- develops interaction and socialization.

- exploits the flexibility potential of the metaverse to better respond to specific student needs,

Despite the fact that the metaverse universe is still in its infancy and that the ultimate and singular metaverse has not yet been created, many of its elements are already in place, and there are plenty of options. As a result, educational institutions must also overcome a number of obstacles, including

- **Infrastructure and equipment for the metaverses**: These require both human and financial resources, but before the indispensable financial resources can be used to implement the necessary infrastructures, there must be a thorough, calm, and responsible reflection that is open to all possibilities and to all actors who can contribute to the dynamics of transformation of our education through the innovative and creative integration of technologies.
  There are a lot of technical difficulties as well (you need a strong internet connection and hardware with a graphics card or enough power). Given the tools and abilities required to use these new services, electronic illiteracy will likewise pose a significant problem. Therefore, it would be wise to consider this feature when creating metaverse. From a technological standpoint, the expansion of the metaverse depends on the scalability of space computing, Internet bandwidth, and energy efficiency, as well as navigating interoperability protocols if we are to truly see networked virtual worlds.

- **Diverse training options:** To face the difficulties of the metaverse, colleges and training institutions should provide technical training tracks that excel in immersive technology.
- **Accessing and exiting metaverse**:i t will be important to foresee the effects of metavers for both users and those who will not be able to utilize them. In fact, the issue of access disparities can take on a variety of shapes, including sensory and cognitive, as well as economic and social ones (such as illiteracy, the ability to pay for equipment and a reliable connection). Some people might have more intense and satisfying experiences in the metaverse than in the real world, albeit there is a chance that they will find it difficult to leave.

Conclusion

The metaverse is in constant transformation, the multiplication of educational metaverse platforms is dizzying. Malcolm Frank has equated Metaverse as a business model that would have a significant impact on the educational world. For this reason, the university should be ready to adopt or develop new devices to keep pace with these changes, to create innovative digital services, enjoyable experiences for learners, more emotional, more immersive interactions and more engaging relationships if they place the learner at the center. To fill a genuine demand and establish itself as a significant regional player in the metaverse, the institution must actively participate in the training of future executives in immersive technology. We identified the contributions and problems of the metaverse in the context of language instruction in this research after exploring the actors' perceptions of its use based on a poll of 125 students and 23 teachers.

As a conclusion, we have shown that language teachers place a lot of emphasis on the hunt for "innovative" pedagogical approaches (how may metaverse be used to educate in a more novel, engaging, motivating, and relevant way?). the teacher must also be interested in the pedagogical situation that will be put forward in the metaverse, i.e., what to teach and what to evaluate there? When we discuss how language skills evolve in metaverse, this is the main issue that is at stake. In fact, we will provide learners with tailored language education through the use of metaverse in terms of the subject matter to be studied, the multimedia resources to be used, and the language learning tasks to be completed. This innovative instructional approach will prompt the following inquiries: Does the hybrid device that incorporates the metaverse have the potential to help scientific students

improve their language skills? This question obviously extends far beyond the findings of the current investigation. Using the experimenting of the metaverse in the context of hybrid language teaching as a foundation, the answers to this question will be offered in a future research project.

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