

## The role of technology in language immersion: a systematic literature review

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### ABSTRACT

Challenges and oppositions related to language immersion implementation are still ongoing, although numerous types of research have shown the positive impact provided by this program in a wide range of aspects. One of the most bulging challenges is that language learners are restrained from conducting language immersion directly in the country where the target language is spoken. To responding such challenges, the researchers, through this systematic literature review, reveal many important aspects that one should consider in achieving successful language immersion and probe the right technology that could provide an immersive language-learning environment. The researchers explored 56 articles covered in this research scope based on the inclusion criteria to answer the existing formulation of problems. The result identified the importance of the environment, the leader and teacher's vital role in establishing the immersion program's objective, and translating parents' expectations when registering their children for the program. Utilizing technology such as virtual reality and games in language learning can imitate an immersive language experience. Developing other kinds of technology is required to bring a vaster preference for the parents who want to apply language immersion through technology in their children's language learning.

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## 1. INTRODUCTION

Linguists and psychologists have discussed language acquisition for children and foreign speakers. There are many theories and opinions regarding this topic; however, most realize that the environment has a massive and crucial role in language acquisition [1], [2]. The environment is the main factor in foreign language learning because the ultimate goal is for students to achieve the same ability as native speakers [2]. If one wants to master a language, one needs to mold or immerse oneself in an environment surrounded by the target language, or in other words, carry out language immersion. Language immersion is usually undergone by visiting or living in the country where the target language is spoken [3]. Going to the target country is important because native speakers have their own linguistic mechanisms and cultural systems and comprehend language usage in every context [2]. Visiting or living abroad makes language learners not have to bother themselves to look for someone who speaks the target language. Additionally, being surrounded by the target language daily provides unlimited opportunities for a language learner to study and practice [4].

Since 1965, several variants of language immersion which might be more desired or worthy have been implemented depending on the requirements and available resources [5]. Based on the age difference of initiation, language immersion is divided into three, early immersion, middle immersion, and late immersion [6]. Other language immersion variants are total, partial, and two-way immersion [5]. These diverse language immersion variants have widely implemented and brought positive impact to language learners, be it the aspect of linguistic [7] and cognitive [8], [9], language use [10] and proficiency [11], [12], phonological awareness [13], faster language development [14] in a shorter time and better result [2], provides a unique contribution to receptive and expressive language skills [15], multilingual attitude [16], multicultural identity [17], [18], and intercultural competence [19].

On the other end, language immersion is not a panacea capable of overcoming all learning obstacles in disadvantaged socio-economic contexts [20]. Moreover, increased exposure to a foreign language in language immersion may increase motivation over targeted language, but it can also decrease instrumental reasons on local language [21]. Furthermore, language immersion on several occasions could present confusion and concerns for learners if they have not had adequate language knowledge to follow this program. It is proven in the research [22], learners who follow language immersion programs come through communication apprehensions in four communication contexts, group discussions, meetings, conversations, and public speaking, which in turn may bring negative impact on learners' performance, participation, course grades, cognitive processing, and motivation. From the other psychological aspect, there is no benefit explicitly seen from language immersion participants in the Stroop task [23] and executive functions [24]. In addition, double demand in paying attention to language and content in language immersion is often resolved by favoring the content. This eventually ended with the assumption that learners will obtain most of their vocabulary unintentionally through reading [25]. Therefore, the balance between language and content in language immersion is crucial to consider. Eventually, language immersion development will continue to raise many challenges and contentions, but first and foremost is how to maintain the program quality measured from a consistent result of the learners [26].

Starting from the previous controversy, this systematic literature review aims to explore the trends in language immersion research during 2020-2022. Besides, this study reveals various important aspects of establishing a successful language immersion. Additionally, this study thoroughly probes the role of technology in language immersion which may become one of the alternatives for immersive language learning, specifically for those who found it hard to make immersion travel to the country where the target language is spoken.

## **2. RESEARCH METHOD**

### **2.1. Research design**

This systematic literature review adopts a qualitative systematic literature review model developed by [27]. The systematic literature review (SLR) model offers six stages which the researcher should do. The stages are: i) formulating research questions; ii) searching the literature for review; iii) screening and selecting research; iv) conducting findings analysis and synthesis qualitatively; v) carrying out quality control; and vi) arranging report. The researchers pull through these steps one at a time carefully to obtain good results.

### **2.2. Formulating research questions**

This study provides accurate data and information regarding language immersion application in language learning. To actualize these matters, the researchers formulate the following questions of problems: i) What are the trends in language immersion research during 2020-2022?; ii) How to achieve successful language immersion in language learning?; and iii) What is technology's role in language immersion studies during 2020-2022?

### **2.3. Searching literature for reviewed**

In this stage, the researchers conducted a literature search on the Scopus database and comprehensively assisted with Publish or Perish application. In the search process, the researchers employ the keyword search "language immersion" in the "Title Words" and "Keywords" columns and limit the search year to 2020-2022. The researchers conducted a literature search on 18 December 2022 and derived 95 studies. The number of articles then has been validated on the Scopus database through its website.

### **2.4. Conduct screening and selection**

After conducting an article search, the researchers implement a screening process by employing inclusion criteria to ensure that data conforms to the research objectives. The literature selection is directed to answer the research questions arranged in the previous stage. Therefore, inclusion criteria are crucial in designing a high caliber of research. The researchers apply the following inclusion criteria: i) Outcomes of the

research, such as journal articles, conference papers, or book chapters; ii) Written in English; iii) Published during 2020-2022; iv) Available in full-text; and v) Discussing language immersion in language learning.

In this stage, the researchers conduct article screening and selection on 95 studies found during the search process through Publish or Perish application by manually identifying titles, abstracts, and keywords. This method is carried out to ensure the studies obtained are relevant to research objectives. From a total of 95 studies, the researchers derived 56 studies that met the inclusion criteria applied before. Researchers excluded 39 studies because they did not meet the criteria; 34 studies were not available in full text, another 4 were not in English, and 1 study did not discuss language immersion in a foreign language. Based on the criteria of publication year, 8 studies in 2020 were excluded, 11 studies in 2021 were also excluded, and 20 studies in 2022 were excluded as well. Afterwards, the researchers downloaded the full text of 56 studies that was passed onto the next stage.

## 2.5. Conducting findings analysis and synthesis qualitatively

The researchers read every manuscript and re-checked every document to ensure the manuscript conformed to the criteria and no duplication occurred. In this stage, the researchers did not find such duplication in those 56 studies. Hence, the 56 studies are feasible enough to be included in the final phase of the systematic literature review.

## 2.6. Carrying out quality control

In controlling the quality, the researchers read the full text, from top to bottom, of all manuscripts corresponding to the criteria applied. It is why the researchers take the full text of the manuscript availability as the inclusion criteria. This insertion is also to determine the derived manuscript's feasibility. Subsequently, to provide an accurate and comprehensive systematic review, the researchers discussed the manuscript's relevance to the research's main questions regarding language immersion.

## 2.7. Arranging report

The last stage in this research is arranging the research report within a scientific article arrangement; it has the structure of introduction, method, results and discussion, and conclusion. The researchers present the findings related to language immersion research trends in the results and discussion section. After that, the researchers discussed important aspects that support the success of language immersion and ended with a discussion about the role of technology in language immersion.

## 3. RESULTS AND DISCUSSION

### 3.1. Research trend on language immersion

From 56 studies included in this systematic literature review, publication trends by year related to language immersion in the last 3 years have fluctuated, as shown in Figure 1. These publications mostly occurred in 2021 with 22 publications, 2022 with 18 publications, and 2020 with 16 publications. However, suppose the excluded publications within the systematic literature review were also counted. In that case, it can be concluded that the trends of language immersion publication during the last three years in the Scopus database were increasing yearly: in 2020 with 24 publications, in 2021 with 33 publications, and 2022 with 38 publications.

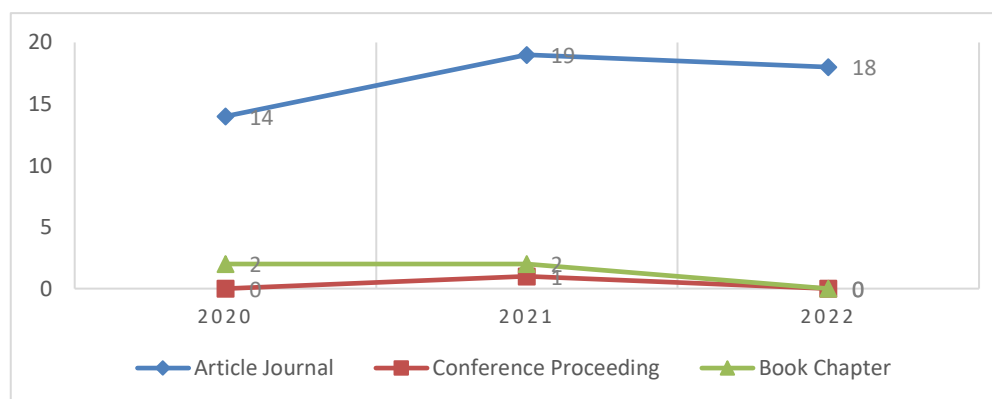


Figure 1. Language immersion publication trends by year

In this study, the researchers also discovered data related to the language target studied in language immersion publications during 2020-2022. From the 56 studies, language immersion has been applied to learning in 27 languages. Figure 2 explains that based on the number of studies during 2020-2022, language immersion is most widely used in English (n=27), followed by (n=12), French (n=6), Chinese (n=5), Mandarin and Portuguese (n=4), German (n=3), and Dutch and Irish (n=2). Meanwhile, 18 other languages, such as Hakka, Black, Swedish, Finnish, Hebrew, Russian, Persian, Cantonese, Gaelic, Arabic, Hindi, Indonesian, Japanese, Korean, Malay, Tamil, Thai, and Vietnamese, are mentioned 1 time. In addition, from 56 studies, the researcher found 4 studies which did not specifically mention the target language of language immersion in their research and 18 studies which mention more than one target language. In fact, one of the studies [19] mention 13 target languages in their language immersion study.

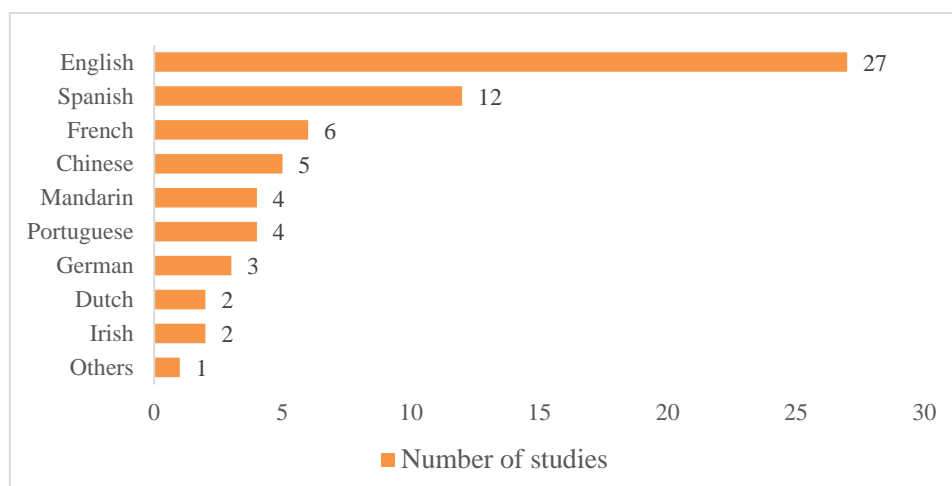


Figure 2. Distribution of target languages in language immersion studies

Afterwards, the researchers present data related to educational level and types of language immersion applied. If one sorts the list, language immersion in this systematic literature review is most widely spread in elementary school (n=32), followed by secondary school (n=6), kindergarten (n=4), university (n=3), dan preschool (n=2). This result indicates the importance of immersion during childhood age. In addition, the researchers found 15 studies that did not mention specifically the level of education in which language immersion is applied and 5 studies that examined language immersion at more than one level of education. Related to the type of language immersion, the researchers found more studies examining language immersion in general (n=29) compared to the studies that focused on certain types of language immersion (n=27). Studies that focus on certain types of language immersion are the most widely studied on dual language immersion/two-way immersion (n=21), followed by early immersion (n=3) and one-way immersion (n=3). These results indicate the development of language learning in education that supports bilingualism.

### 3.2. Successful language immersion

The main purpose of language immersion is to improve language proficiency [11]. In its implementation, as described in the introductory section, language immersion significantly affects and even various other aspects for language learners to achieve this goal. On the other hand, if it was viewed from the parent's perspective, they felt satisfied with the language immersion program [28]. Later on, their reasons for registering their children in the immersion program are based on identity, capital, ideology [15], economic opportunity, and multilingualism [29]. They also believe that language immersion will help children build a stronger self-identity, help children in non-language subjects, and aid their offspring in entering better universities and more academically demanding, hoping their children can interact with different cultures and foreign cultures will enrich their lives [30]. From a different perspective, parents wished their children were excited and motivated to participate in the immersion program [29]. With the myriad benefits offered and the parents' wishes, responsible stakeholders need to consider many different aspects that can support language immersion success as shown in Table 1.

Table 1. Aspects of successful language immersion

Aspects	Sub-category	Study
Environment	Highly intensive daily contact and interaction	[3], [8], [19], [31]
	Integrating language majority and minority learners in two-way immersion	[14]
	An equitable language environment	[32]–[35]
	Language input and output	[3], [15], [36], [37]
Teacher	Enjoyable learning environment	[22]
	Knowledge	[38], [39]
	Instructional skills	[22], [39], [40]
	Language and content integration	[25], [39], [41]
	Pedagogical planning and practice	[22], [38], [39], [41], [42]
	Teaching material	[39], [43]
	Language skills	[39], [41]
Leader	Experiences	[38], [44]
	Establish a positive culture	[45]
	Providing support for program and teacher	[45]
Learner	Knowledge, skills, mindset, and attitude	[17], [45]–[47]
	Necessary knowledge of language	[22]
	Motivation, learning strategies, and social identity	[10]
	Language background	[10], [48]

First of all, the advantages that language immersion offers to language learners come because language immersion provides highly intensive daily contact with the target language in various situations, including academic and everyday communication [8]. Intensive contact and communication with the target language from the surrounding environment can also provide input to participants regarding language use and then train them to construct, remake, and apply the target language to their interaction [37]. This intensity is an important aspect of language immersion because intensive communication, although not fluent, can improve the quality of interactions, lead to stronger relationships and enable them to gain knowledge of the target language and a more authentic and rich experience [31].

Furthermore, they need leaders and teachers who understand the program well to establish a successful language immersion. It is not just them who were immersed accidentally and without the slightest idea of what to expect from this program. Immersion leaders must build a positive culture by building trust, communicating with parents and teachers, demonstrating a commitment to the program, and providing support to program and teachers [45]. Meanwhile, teachers need to prepare various interactional and pedagogical skills [38], formulate effective learning strategies, set goals and success criteria [40], and seek to increase awareness, sensitivity and understanding of world cultures while focusing on meeting the purposes of the target language and content to deliver responsive learning [44]. These instructional skills, especially language and content integration, are the heart and soul of immersion teachers [39]. Another important aspect is the need for adequate teaching materials and good language skills for teachers [39], [41]. For teachers, the target language skills are vital, considering the importance of interaction in immersion programs.

### 3.3. The role of technology in language immersion

Immersing oneself in the country where the target language is used is one of the most effective ways of learning a second language [3]. Nevertheless, second language learners who want to make immersion travel often encounter difficulties, both from a financial and another perspective, especially for those in disadvantaged socio-economic circles [20]. Therefore, utilizing technology in interactive language learning can replicate immersive language learning experiences [3]. Table 2 shows the types of technology and their role in language immersion.

Table 2. The role of technology in language immersion

Type of technology	Roles	Study
Virtual reality	Beneficial for contextual vocabulary learning	[49]
	Help students continuously in language proficiency	[50]
	The feedback can help student to correct their language use	[50]
	Foster relevant and personalized conversations	[51]
	Paralinguistic cues support	[51]
	Inspiring learner motivation and autonomy	[52]
	Vocabulary and reading comprehension gains	[53]
Game	Game literacy and language support affordances	[53]
	The game as a mediator for discussion	[53]
	Replicate an immersive language learning experience	[3]

One of the technologies which can be utilized as immersive language learning media is virtual reality; language learning through virtual reality can stimulate learner's motivation, inspire their self-reliance, build a pleasant learning atmosphere, encourage them to present a positive attitude towards learning [52], and improve their involvement in learning. Additionally, virtual reality affects language learning outcomes; multiple virtual reality exposures are necessary for effective learning, and virtual reality is useful for learning contextual vocabulary [49]. By applying virtual reality, learners with low language skills can rely on paralinguistic cues (such as reading lips movements) to translate the interlocutor's speech [51].

In addition to virtual reality, language immersion can also be integrated into game-based learning. A study [53] marked up seven skills students derived when playing a digital game in the classroom. That study divides the abilities into two main categories: game literacy and language support. Quest management, battle strategies, and technical affordances comprise the first category and mostly contain assistance and discussion regarding game mechanics. The second type of ability is generic L2 support, which includes encouragement, confirmations, game talk, and language skills. The provision for encouragement propelled students to read independently and to concentrate on important texts. Similarly, linguistic affordances enabled players to quickly acquire vocabulary knowledge before returning to the text, and in certain circumstances, linguistic affordances enabled extra conversation about a word.

In the end, utilizing technology in language immersion has an important role in presenting an interactive learning ambient and increasing student engagement. The teachers and learners may discuss the game further, so it becomes a mediator for discussion [53]. Language immersion implemented through virtual reality can encourage a relevant and personal conversation, allows them to do role play and task-based learning, and triggers learners activity related to what they can discuss, providing them more freedom [51]. Moreover, it offers proper control for students over language learning, making them more aware of pursuing learning so that they become more independent [52]. Nevertheless, in this study, the researchers only found two technologies utilized in language immersion, i.e., virtual reality and game. At the same time, technology continues to develop rapidly from time to time. Therefore, language educators need a more diverse form of digital technology that can be accessed by all language learners worldwide who wish to master languages through immersive learning.

#### 4. CONCLUSION

The present study was designed to determine successful language immersion and the role of technology in language immersion. Teachers' pedagogical understanding and instructional skills are equally important, with knowledge, skill, and action from immersion leaders to establish a successful program. On the other hand, technology poses an important role as a mediator in building an interactive, independent, and full-of-freedom language learning ambient so it can be a solution for those who cannot afford to go abroad. One of the technologies that can be used as an immersive language learning tool is a virtual reality application vTime. The question raised by this study is whether only virtual reality and games technologies can be utilized to have an immersive language learning experience. Further research needs to probe thoroughly or even develop other technology that can be harnessed for such purpose. This systematic literature review is surely far from perfect. The most bulging limitation is the year range limit of the research and database source taken as review material, that is, studies published during 2020-2022 contained in the Scopus database. Additionally, in the search process through Publish or Perish application, the researchers only apply one keyword search.

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