Exploring the potential of a virtual learning environment for the learning of the Spanish language and culture in Aotearoa New Zealand

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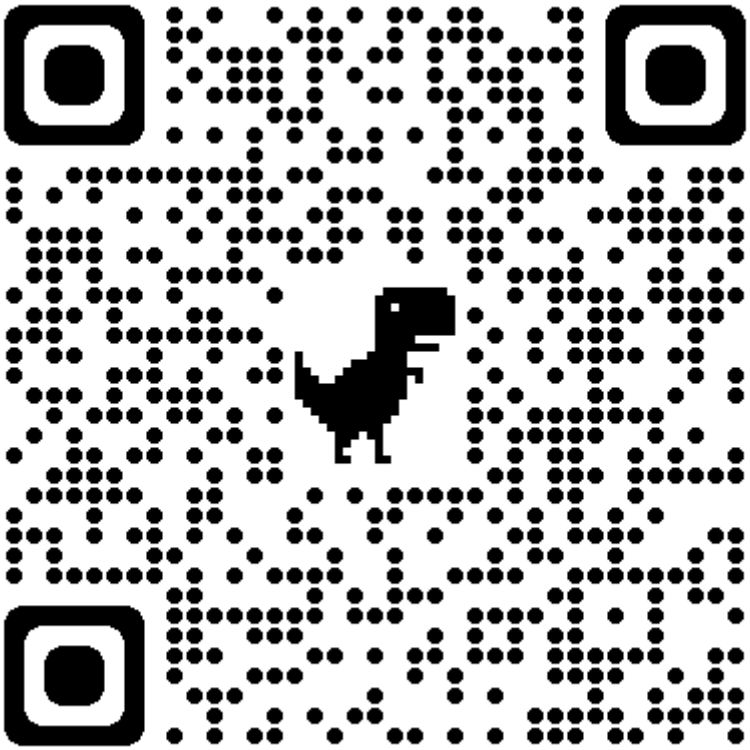
Abstract

Technology and globalisation have enabled unprecedented interaction between people from diverse cultural and linguistic backgrounds. However, greater contact does not always guarantee successful communication, which requires understanding and awareness of the sociocultural norms embedded in language. Subsequently, learning additional languages requires an intercultural approach to appreciate the interconnection of language and culture. Language education is undergoing a profound paradigm shift from traditional instruction towards social awareness and intercultural communication, supported by engaging pedagogical resources and innovative learning environments. Unfortunately, language teaching has tended to underutilise digital resources within and beyond the classroom. This practice-based research investigates to what extent a virtual learning environment (VLE) in the metaverse can potentially facilitate Spanish language learners' intercultural communicative competence (ICC). Based on a framework devised from a literature review and interpretation of research on ICC development in digital learning, a prototype VLE featuring 13 virtual auditoriums and four art galleries which showcase videos of a first language (L1) speaker of Spanish acting as Frida Kahlo was developed. The VLE was designed to encourage students' self-directed learning, engagement with intercultural content and learning opportunities, and expand general cultural knowledge of Latin American communities. Following a design-based research (DBR) methodology, the VLE prototype was developed and assessed by a panel of experts composed of Spanish teachers, adult Spanish students, and educational technology academics. The panel provided essential information and feedback before, during and after the creation of the platform. Data on usability, content and general feedback from the panellists were analysed, leading to a set of practice-informed theoretical design principles for the development and use of a VLE that potentially facilitates Spanish language learners' ICC and promotes self-directed learning.



Attestation of Authorship

I, Karen Peredo Alarcon, hereby, declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person, nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

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Ethics Approval

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3D	three-dimensional
AI	artificial intelligence
AR	augmented reality
CALL	computer-assisted language learning
DBR	design-based research
ICC	intercultural communicative competence
iCLT	intercultural communicative language teaching
L1	first language
L2	second language
MOE	Ministry of Education
MX	mixed reality
NCEA	National Certificate of Educational Achievement
NZC	New Zealand Curriculum
SLA	second language acquisition
VLE	virtual learning environment
VR	virtual reality
XR	extended reality

1. Introduction

This chapter presents an overview of the state of additional language learning in Aotearoa New Zealand. Subsequently, the rationale for the construction of a virtual learning environment (VLE) is presented. The VLE developed for this study featured 360° interactive spaces in the metaverse where students can meet a Spanish first language (L1) speaker in the guise of an influential historical character. The study prototypes a classroom resource to promote language learners' intercultural communicative competence (ICC) and to encourage self-directedness.

1.1 Globalisation and Technology

Globalisation and the rapid development of innovative technologies have impacted the education sector, leading to the study and application of technological advancements (Narayan, 2017). Today's students develop and learn technical skills and principles through technology, which they can apply in their lives (Reid-Martinez & Grooms, 2021). Globalisation and technology permit unprecedented interactions between individuals of diverse cultural and linguistic backgrounds and have created a sense of global citizenship (Lyddon, 2018). Real-life virtual scenarios promote communication (Alves, Miranda & Morais, 2019) and boost learners' engagement in contexts as diverse as gaming or social media, in which users participate either passively or as active content creators (Blaschke, 2012). In terms of language learning, digital spaces provide New Zealand students with opportunities to engage with L1 speakers around the world despite the country's geographical isolation, refining self-directed learning pedagogies and techniques in the process (Tolosa, East & Barbour, 2021).

Learning an additional language and its cultural practices is crucial to fulfilling the expectations of global communication. At the same time, however, English is considered the world's universal language. It is the main tool for international communication and sits at the top of the global language network (Yang et al., 2020), normalising monolingualism (Lanvers, Thompson & East, 2021). The teaching and study of foreign languages in Anglophone cultures have reached a breaking point, with teachers frequently encountering significant difficulties in attracting and keeping students in language classrooms (East, 2012).

English, as the globally dominant language, has led its speakers to develop a sense of complacency when it comes to learning other languages, and low regard for linguistic skills (Minagawa & Nesbitt, 2021). Languages are, however, an essential tool against discrimination and are key in globalising education and developing intercultural citizens (Ramirez, 2018b). Despite the many benefits of learning languages, such as personal growth and cultural awareness, most importance is placed on economic gain, constraining societies to act ethnocentrically – that is, evaluating others according to one's community and beliefs of superiority (Fantini, 2009).

Ramirez (2021) observes that Aotearoa New Zealand reinforces a neoliberal Anglocentric approach to learning languages which focuses on lucrative aspects, whereby language and culture are undermined. The emphasis is on opportunities for economic growth, global trade, economic advantages, and workers' productivity. Interculturalism and global skills require active engagement and critical thinking and should not depend on capitalist opportunities. By maintaining a market-oriented framework to operate in international or intercultural settings, certain cultures are disadvantaged due to their economic potential, perpetuating cultural stereotypes (Ramirez, 2021). Employment prospects and economic benefits could act as extrinsic motivators; however, for secondary students learning a second language future job projections may seem irrelevant, especially if they believe the myth that English is all they need to succeed (East, 2012).

Although Aotearoa New Zealand recognises its multiculturalism in both official and everyday contexts, most of the population still views English as the only valuable language to learn (Berardi-Wiltshire, 2017). The elevation of English suggests that foreign language education's long-term viability may require a paradigm shift in approach (Nicolaidou, Pissas, & Boglou, 2021) – a change from traditional language teaching towards social awareness and multisensory intercultural communication (Lyddon, 2018) in new teaching and learning surroundings (Pardo-Ballester & Rodríguez, 2013a). As the constant improvement of capabilities and functionalities associated with student interaction improve, innovation and resource sharing, VLEs are emerging as the future of education. In VLEs, information and communication can be provided synchronously, asynchronously, or multi-directionally, allowing teachers and students to connect (Alves et al., 2019).

1.2 Spanish Learning in Aotearoa New Zealand

The Spanish-speaking population is small in Aotearoa New Zealand. In the 2018 Census, 38,823 were reported as Spanish-speakers and 25,731 as Latin Americans (Stats NZ, 2018). However, the status of Spanish as an international language has long been acknowledged, and Spanish-speaking cultures have become more visible throughout Aotearoa New Zealand (Seals, 2022) due to the economic and cultural ties being developed with the Spanish-speaking world (Berardi-Wiltshire, 2017). Moreover, the Aotearoa Spanish Language Week was organised for the first time in August 2022 by the government-established Centres of Asia-Pacific Excellence (CAPE) which aims to enhance the country's engagement in education and business with North and Southeast Asia, and Latin America (CAPE, n.d.). Spanish as a school subject has increased in popularity in New Zealand. In the early 1990s, there were 256 secondary students enrolled in Spanish (Lee, 2013) compared to 11,786 from Years 9 and above in 2022 (Education Counts, 2022), demonstrating that the position of the language has unmistakably changed.

1.2.1 Spanish in the Aotearoa New Zealand Curriculum

Spanish is one of the nine foreign languages included in the Learning Languages area of the New Zealand Curriculum (NZC) among Chinese, French and others. Learning Languages is an area added in the renewed 2007 NZC (Ministry of Education [MOE], 2007), which recognised languages as an essential aspect of education. This was in response to international and intercultural communication's global significance and intended to encourage students to actively participate in New Zealand's diverse, multicultural society and international society (Stevens & Hipkins, 2016). Learning Languages is separated into three strands, with Communication as the core, supported by Language Knowledge and Cultural Knowledge, recognising language and culture are interconnected (Rivers, 2010). Learning Spanish at senior levels develops understanding between individuals from diverse backgrounds who interact in multicultural and multilingual societies. In the case of Spanish, learners aspire to "discover the rich history, customs and culture of the communities in which Spanish is spoken" (National Certificate of Educational Achievement [NCEA], 2020, para. 2). The NZC

provides positive opportunities for all students to have access to learning a foreign language.

The Big Ideas and Significant Learning form the Learning Matrix for Spanish (NCEA, 2020) acted as a reference point for this study's prototype. The five Big Ideas are: (1) communicating with people across cultures; (2) express[ing] meaning through unique spoken, written, and visual forms; (3) language, culture, and identity are inextricably linked; (4) more than one language encourages diverse ways of thinking; and (5) empowering process[es] that require risk-taking and foster resilience and perseverance (NCEA, 2020). The ability to confidently interrelate is seen as vital (MOE, 2017) and thus genuine communication for everyday purposes is encouraged; this key component focuses on students' ability to understand and utilise meaningful language in authentic communicative situations, and it is essential in language resources.

1.2.2 Spanish for Everyday Situations

Spanish learning in Aotearoa New Zealand is about developing the skills to converse with others about everyday situations. The subject directs teachers and students to seek communicative teaching approaches and effective resources to provide opportunities to develop key competencies, such as relating to others and using language in context (Stevens & Hipkins, 2016). Intercultural skills such as developing, recognising, expanding, and reflecting on the language are encouraged for effective communication. However, there are limited numbers of classroom resources offering practical examples of intercultural communication (Ramirez, 2018a). While the goal is to prepare students for real-world interactions, courses can often be delivered in traditional, structured and hierarchical ways, where the emphasis is placed on grammatical rules rather than learning how to interact with people (East, 2021). East, Tolosa, Bierbricher, Howards and Scoot (2018) state that students' comprehension of concepts related to intercultural communication varies greatly. Teachers agree that languages should be participatory and communicative yet approaches to culture focus on data transmission and are seen as a separate area of study. Culture frames how language is structured and used. To be well-equipped to interact, students require cultural knowledge as much as they need grammar and vocabulary (Liddicoat, 2004).

Stevens and Hipkins (2016) identify six issues in the Learning Languages area of the NZC: (1) low priority; (2) mixed policy signals; (3) the need for sustained learning; (4) crowded timetables and curricula; (5) the lack of ongoing professional training; and (6) the lack of digital resources aimed at language classrooms. Teachers are encouraged to adopt an intercultural approach in which the focus on cultural aspects is vital to developing both language and intercultural skills (Ramirez, 2018a). Nevertheless, intercultural language teaching is difficult to integrate due to the lack of a well-understood pedagogy, teacher proficiency, professional development opportunities, and suitable classroom resources (Ramirez, 2021). Hence, this study aims to prototype an immersive digital platform to facilitate the learning of the Spanish language and culture for everyday situations.

Invigorating the foreign language profile in the secondary sector is imperative. Although the delivery of language education in primary and intermediate schools has grown, the number of students in high school choosing additional languages is decreasing drastically (East, 2021). There is a concerning trend of students dropping additional languages by the time they reach secondary school (Jones, 2014), even when led by specialist language teachers (East, 2021). The lack of language status and the low priority that additional languages receive in monolingual cultures such as Aotearoa New Zealand are seriously impacting and marginalising language learning (Stevens & Hipkins, 2016). To facilitate the learning of the Spanish language and culture, this study prototypes an immersive platform with topics related to everyday situations.

1.3 Aotearoa New Zealand Language Initiatives

Although Aotearoa New Zealand is a bicultural nation in which the Indigenous te reo Māori is an official language, and New Zealanders do live in an intercultural context, little has been done to augment the development of learning additional languages in the country (East, 2021). Several studies demonstrate how language teachers find it difficult to develop and integrate a commonly understood intercultural methodology (Conway et al., 2010; East, 2012, 2021; East et al., 2018; Oranje, 2016; Ramirez, 2018a, 2021). Initiatives such as an amendment to the Education Act 1989 carried out in 2020 aim to improve access to second

language (L2) learning in state schools (New Zealand Parliament, 2021), and important modifications to NCEA (to be implemented in 2024) are positive signs.

1.3.1 Language Principles

As part of the MOE's initiative to promote language learning and assist language teachers, two literature reviews and an exploratory study were commissioned to inform and expand on the establishment and development of the revised 2007 curriculum for languages. Ellis's (2005) literature review outlined 10 general principles for success in instructed language learning based on findings from diverse studies on second language acquisition (SLA). These principles place importance on meaning, form and communication in learner-centred environments. Subsequently, the MOE funded another study which recommended six principles that focus on intercultural communicative language teaching (iCLT) to be implemented in language classrooms (Newton et al., 2010). Newton et al.'s (2010) report complemented Ellis's (2005) principles by creating awareness of the sociocultural aspects involved in language learning and their effective implementation; these principles encourage language teachers to move away from traditional approaches towards ICC, interaction-based and experiential methods (Ramirez, 2018b). Furthermore, in 2013, the MOE also commissioned an exploratory study that considered ways to measure New Zealand secondary students' international capabilities. International capabilities "can be seen as the intercultural facet of the key competencies" (Bolstad, Hipkins & Stevens, 2013, p. 9) of the NZC. Skills, knowledge, attitudes, dispositions, and values facilitate living, working, and learning across international and intercultural conditions, and are both socially and economically essential to being global citizens (Bolstad et al., 2013).

1.3.2 Limitations and Future Aspirations

The benefits of multilingualism and interculturalism might be overlooked in Aotearoa New Zealand (Jones, 2014) due to the absence of a well-understood intercultural and global citizenship pedagogy and the deficiency of up-to-date classroom resources on interculturalism (Conway et al., 2010). iCLT principles are not actively taught, as resources that offer practical examples are limited (Ramirez, 2018a). The challenge is massive, as "there is a very real sense in which New Zealand's attitude to teaching and learning languages requires a genuine cultural change. The extent of the change required should not

be underestimated" (East, 2008, p. 130). Potential ways forward involve learner-centred and self-directed pedagogical approaches as well as engaging digital resources which may improve students' classroom experiences and, as a result, help alleviate the problems of discouraged students and poor enrolment and retention (East, 2012).

An optimistic initiative implemented in 2020 enables all primary students to learn te reo Māori. This potential way forward aims at enabling the future high school graduates of 2033 to converse in a language other than English (New Zealand Parliament, 2021). Furthermore, NCEA Level 1 is expected to transition into a new qualification and be fully implemented in 2024. These implementations are to promote inclusiveness, success and well-being for all, preparing students in an embryonic way whilst reducing students' and teachers' workload (NCEA, 2020). Language teachers have welcomed the time allowance for NZC modifications to cultural methodologies so students are more likely to succeed. Nevertheless, these initiatives are not sufficient to encourage language learning and have not had a massive impact on establishing a language policy (Ashton, 2018). Aotearoa New Zealand should move to innovative learning environments and intercultural language pathways to find out how and where languages are used, learnt, and preserved in the digital era.

1.4 Research Question

Following the above background on the current context of learning the Spanish language in Aotearoa New Zealand, this research poses the following question:

> To what extent can a virtual learning environment in the metaverse facilitate Spanish language learners' intercultural communicative competence?

1.4.1 Project Rationale

To explore to what extent an immersive VLE can facilitate Spanish language learners' ICC, practice-based research (Gauntlett, 2021) was carried out. The outcome of this project was a virtual platform prototype where students could meet and greet a historical character from a Spanish-speaking nation. This classroom resource features interactive and immersive 360° spaces in the metaverse where videos of an L1 speaker acting as a historical leader and supplementary activities can potentially facilitate the development of communicative and

intercultural skills beyond the language classroom. The VLE includes activities to encourage communicative skills on topics based on the life events of Frida Kahlo, a prominent Mexican artist who is recognised for her self-portraits, attention to Indigenous cultures, and representation of women in her work.

Frida Kahlo's VLE videos have the potential to sharpen skills such as listening comprehension and relating to others by hearing and seeing her struggles in her work. Thirteen scenes were written and shot in which Frida discloses personal beliefs, emotions, expectations and reactions to specific historical events, and shares her life achievements, disillusionments and contributions to society. Each scene is connected to a reference painting for students to be able to recognise her art and connect it to a stage of her life. The actress communicates meaning through non-verbal expressions and body language for learners to be encouraged to input questions and examine the meaning in gestures. Likewise, the setting in which the scenes were recorded provides students with additional cultural elements, such as traditional outfits, books, accessories, and music references to notice and self-direct their cultural explorations.

The prototype offers opportunities to experiment with and recycle Spanish as students must produce original content to complete the assigned tasks for each scene. As this is a resource for the Spanish classroom, Levels 2 and 3 NCEA provided vocabulary lists, a variety of language structures such as past tenses, and grammatical points as well as idioms, proverbs and famous quotes from Kahlo are part of the script. The complementary tasks at the end of each scene have the potential to develop confidence when monitoring one's own learning and accuracy when talking and creating content about everyday situations. The scenes can be watched in auditoriums and galleries developed in the metaverse.

1.4.2 Research Approach

This practice-based research is grounded on a framework devised from a literature review and interpretations of studies on ICC in VLEs discussed in Chapter 2. The investigation follows a design-based research (DBR) methodology (Amiel & Reeves, 2008) to prototype a practice-based artefact that facilitates Spanish language learners' ICC. DBR promotes a sequence of insightful design inquiries informed by real-world scenarios and theory that facilitates the identification of appropriate interventions, leading to producing valuable,

relatable, and reciprocal new tools and learning practices (Rodríguez, 2017), for instance in digital spaces. Opportunities to solve practice-oriented problems addressed by research increase as researchers, practitioners, end-users and developers work together to monitor and improve guidelines for prototype features and create a plan of action by identifying new or reusable design principles with the potential of transferring them to other similar settings (Pardo-Ballester & Rodríguez, 2009). The study involves a focus group, called the 'panel of experts' (following DBR terminology) to develop a digital artefact as a model of a classroom resource. The panel of experts is the same throughout the research stages and the investigation requires them to provide feedback about a variety of topics related to language, culture and digital teaching. Participants' expertise and feedback were sought before the development of the prototype or proof-of-concept, then subsequently requested again for input on its potential usability and content. Pardo-Ballester and Rodríguez (2009) suggest that DBR as a style of research is influenced by technological innovations and their affordances, and it possesses the vast potential to develop instructional materials for foreign language learning. The research methodology and details about participants are outlined in Chapter 3.

1.5 Key Points

This chapter has outlined the present state of language learning in Aotearoa New Zealand. In English-dominant cultures, the teaching and study of languages other than English have reached a critical point (East, 2012). The decrease in numbers in language classes in high schools is due to a negative perception and the low value given to multilingualism. Learning a language is most effective when students are involved in real language use which requires them to use language for themselves (Willis & Willis, 2007).

The research question was outlined together with the motivation for creating a prototype for Spanish language learning aiming to engage and encourage students to be aware of ICC scenarios and promote self-directed, lifelong learning. The following chapter addresses the theoretical foundations of the present study.

2. Review of Contextual Knowledge and Practice

This chapter presents a thorough critical review of contextual and practical knowledge of theories and concepts that are relevant to VLE for language learning and ICC development. These are discussed to support the construction of a classroom resource prototype to foster Spanish language and culture learning. First, ICC in foreign language classrooms and VLEs is introduced. Secondly, two social theories, constructivism and social constructivism, are introduced as both emphasise relatable, collaborative, and reflective learning (Brau, 2018). Heutagogy is also presented as a self-directed, net-centric learning approach grounded on constructivism (Cochrane et al., 2017). Thirdly, the affordances in the metaverse regarding education and immersiveness and presence are also explored. An overview of social theories allows students to choose and coordinate learning processes independently, collectively, and at their pace – crucial when designing digital environments – then follows. Finally, pedagogical considerations for good practices are also covered.

2.1 Intercultural Communicative Competence

Aotearoa New Zealand has become increasingly diverse in terms of learners' linguistic and cultural backgrounds (Walters, 2021). Preparing young learners to be interculturally competent and able to relate effectively to diverse cultures has become a significant aspect of foreign language teaching (Tolosa, Biebricher, East & Howard, 2018). Intercultural communicative competence is the ability to successfully communicate and connect with people from various backgrounds (Shadiev, Wang & Huang, 2020) based on one's ability to appreciate and value their culture and uniqueness (Byram, 1997). For Byram (1997), ICC is the predisposition to learn about other cultural practices originating from a motivation to understand one's own social group, conducts and interaction processes; inquisitiveness, openness, and willingness to study new cultures contribute to this motivation. Dziedziewicz, Gajda and Karwowski (2014) regard ICC as the desire to acknowledge, appreciate and embrace cultural differences. Interculturalism enhances one's abilities to value their culture, relate to others, promote social action (Byram, 2021), suspend judgement, and

acknowledge different interpretations during interactions (Akdere, Acheson & Jiang, 2021). ICC shifts from linguistic competence to the goal of "communicat[ing] and interact[ing] across cultural boundaries" (Byram, 1997, p. 7). According to Byram (1997, 2020), ICC in language learning comprises linguistic, sociolinguistic, and discourse competence as well as competencies in the discovery, analysis and comparison of cultures, as it is a humanistic subject. Students benefit from opportunities for authentic communicative experiences, personal development, and global access to work, study and travel.

2.1.1 Intercultural Communicative Competence in a Foreign Language

Interculturalism serves as a link that understands language and culture as bound together from the first day of language acquisition (Oranje, 2016). Intercultural language teaching sees language and culture as interconnected, co-constructing one another and needing to be taught as one (Brown, 1994; Kramsch, 2009). Liddicoat (2008) indicates that language learning needs to provide opportunities to reflect on how one's language and culture work and how language reflects itself on culture. ICC accelerates language learning and develops proficiency (Zhang & Zhou, 2019). Accordingly, linguistic competence cannot be achieved without intercultural awareness; interculturalism serves as a link that binds them together.

Language and cultural programmes should then enable students to understand, experience and appreciate other cultures' social life; living conditions and career aspirations; ways of thinking; and history, art and literature. In addition to improving critical cultural self-awareness, languages can also contribute to developing interest and tolerance for other cultures. Students' confidence levels may increase after interacting with different cultures, contributing further towards improving ICC (Byram, 2020). However, Ramirez (2021) states that ICC does not occur automatically from overseas experiences or simple interactions since critical thinking and instructor-led training are required to avoid generalisation and categorising communities. International expeditions do not guarantee ICC since these skills cannot be obtained in single transactions, must be negotiated, and are a lifelong process that requires attentiveness to observe the invisible aspects of one's and others' cultures.

Intercultural knowledge moves learners from an ethnocentric conception, the perception of one's culture as the primary measure of behaviour, to a greater tolerance for ambiguity in

interpersonal relations (Swartz, Barbosa & Crawford, 2020). Students with ICC act as mediators between culturally diverse individuals by interpreting, clarifying and representing their and others' worldviews. If learners do not understand their culture as a reference, it would be problematic for them to recognise and agree with others' differences (Dziedziewicz et al., 2014). Zhang and Zhou (2019) indicate that there is a direct correlation between prejudice, discrimination and unfriendly speech, which occur when people of various cultural backgrounds and affiliations do not share the same understanding. Ramirez (2021) sees intercultural education as a public good and an effective tool to foster abilities such as empathy and respect towards other cultures and languages and help avoid racism or other forms of injustice.

2.1.2 Intercultural Communicative Competence in Virtual Learning Environments

Virtual learning environments are open spaces that provide opportunities to engage in language exchanges with L1 speakers, irrespective of their location, such as Second Life or Duolingo. Gadgets support students' reflections, active observations, and contributions during these experiences, leading to meaningful, personalised learning (Berti, 2021). When using VLEs in ICC learning, accessing remote materials is significantly enhanced, allowing a flexible approach to education. Language learners in Aotearoa New Zealand can therefore develop an awareness of the faculties to successfully communicate with people from various linguistic and cultural backgrounds (Tolosa, East & Barbour, 2021).

Implementing an intercultural approach to language learning promotes developing skills such as recognising, expanding, and reflecting on language and cultural aspects (Akdere et al., 2021). Through online interactions, language learners can interrelate in authentic contexts and be involved in genuine communicative experiences (Reid-Martinez & Grooms, 2021). Students explore culturally packed settings, transforming them from passive to active contributors, making VLEs a useful medium to promote intercultural partnerships. Mirzaei, Zhang, Van der Struijk and Nishida (2018) explain that students share viewpoints to detect misunderstandings, observe situations from different perspectives, and discuss sociocultural cues. In return, students feel empowered and motivated to self-direct their learning (Cho, 2018). Digital platforms stimulate language learners to compare, contrast and uncover

visible and invisible cultural-linguistic aspects within language (Kaplan-Rakowski & Wojdyński, 2018). Users share their community contexts as culture profoundly affects the way they interact, apply the facts directly and simultaneously, and facilitate global interactivity that would otherwise be unavailable because of geographical restrictions (Reid-Martinez & Grooms, 2021).

2.2 Constructivism

Constructivism as a learning paradigm has shaped and challenged educational concepts in the past and especially at present when faced with new digital advancements. Dewey (1916), Piaget (1977) and Vygotsky (1979) were the pioneers of constructivism's conventions: a fusion of multiple methods diffused into one theory (Amineh & Asl, 2015) within the framework of sociocultural theories.

Past knowledge plays a significant role when acquiring new information. Constructivism holds that knowledge construction depends on personal interpretations and past experiences and thus added content builds on prior understanding (Brau, 2018). According to Piaget (1977), when learners experience circumstances that challenge the way they think, a sense of uncertainty emerges, and thoughts are modified to re-establish balance. Newer information connects with what is already known – that is, by attempting to adapt it to existing knowledge. When learners cannot achieve this, they restructure their present knowledge to a higher level of thinking (Amineh & Asl, 2015). Learners negotiate their understanding depending on past and present experiences to grasp new information, remaining active throughout the learning process. Meaningful education occurs when reflections on prior knowledge find new conclusions.

Learners create new understanding not only by connecting new data with previously confirmed knowledge (Huang, Rauch & Liaw, 2010), but also by engaging with their surroundings. Dewey's (1985) work indicated that the environment affects learning as knowledge cannot be separated from contextual elements. Thus, the relationship between a learner and the environment leads to productive interaction (Meri-Yilan, 2019). The communities in which people live, play and learn are key in the process of constructing new meaning. Piaget meanwhile (1977) emphasised that knowledge construction occurs via

interactions between the learner and the learning environment. Environments influence learning processes, as learners interact and apply new information to daily activities, increasing the effectiveness of learning outcomes (Huang & Liaw, 2018). Content should be relatable, and applicable and involve risk-taking and experiential opportunities (Howard, Gutworth & Jacobs, 2021). Knowledge moves continuously from a logical to a higher level of thinking; this interchange comes from social interactions and is based on what a learner can accomplish with assistance or independently within the environment (Vygotsky, 1979).

Individualised learning occurs when students and surroundings are considered in the process. Piaget's (1977) views of children's psychological growth emphasise the importance of discovery and pace to understand an individual's learning process. Accordingly, learning involves discovering or reconstructing via rediscovery, as learners control the pace of their understanding through active engagement and involvement. Concepts are absorbed, altered, or rejected as students self-direct learning. This involves active, self-driven and critical thinking in any of the progressive stages (Amineh & Asl, 2015). Knowledge is actively created as learners engage with and make meaning of lived experiences and prior information as they reflect on authentic learning settings (Barrie, n.d.). This blend encourages discovery and self-direction while developing new understanding.

2.2.1 Social Constructivism

Social constructivism is a social theory derived from constructivism that emphasises learning via social connections. The settings impact how individuals receive, process or action new data, as cognitive development firstly originates on a social level influenced by external factors such as cultural and social interactions, and subsequently within the person (Vygotsky, 2012). Vygotsky (1979) stresses the importance of social interactions as one of the essential principles of learning, as knowledge is internalised after interacting with the surroundings and other people. Behaviour and the way one interprets the world are shaped through intellectual tools, language being the most important of all. Thus, knowledge creation stems from social interactions in which information is exchanged and renegotiated assisted by the environment, teacher or peers (McLeod, 2019). Working conditions and social conventions shape cognitive development, principles, skills, and perception of reality.

Language is fundamental to constructing reality (Oranje, 2016). Knowledge develops through interactions with others, in which language and culture play a significant part in evolving higher thinking (Oranje, 2016). Knowing how to apply and understand semiotic mediations depends on interactions with experienced individuals in the community; symbols, gestures or actions have social meaning and support thinking and learning (Banihashem et al., 2021). Language is active and continuously renegotiates meaning-making with culture (Ramirez, 2018a).

Sociocultural exchange and negotiation of meaning occur in authentic social interactions as individuals collaborate, reflect on and clarify concepts, customs or behaviours (Russell & Wallis, 2019). Students learn by refining and validating their understandings through social negotiations and by teaching others the same (Alizadeh, 2019). When learners acquire new information, culture-specific resources such as language facilitate participation and the sharing of knowledge. In language learning, students' agency is central to negotiating meaning, both as users and learners, and to contemplating and valuing a language when conveying meaning within specific cultures.

2.2.2 Heutagogy

Student-centred strategies influenced by constructivist views are characterised by rich learning environments for realistic, active and lifelong learning experiences. Heutagogy, or self-determined learning, is a self-directed, personalised and self-regulated learning approach grounded on constructivism that enables independent learning (Cochrane et al., 2017; Hase & Kenyon, 2000). Heutagogy (self-determined learning) is considered the next stage of self-managed, personal and experiential learning as it builds upon the concept of the learner being "the major agent in their learning, which occurs as a result of personal experiences" (Hase & Kenyon, 2007, p. 112). Learners are considered self-sufficient, and prominence is given to their abilities; the objective is to prepare effective critical thinkers who know how to learn and are ready to confront real-world issues (Blaschke & Hase, 2021).

Heutagogy emphasises student self-determination and collaborative skills to achieve meaningful learning and understanding of how people learn (Blaschke & Hase, 2021). The teacher's role changes from content creator and distributor to "designer of learning

experiences and environments" (Cochrane et al., 2017, p. 56). Teachers are seen as facilitators of knowledge; this is significant as students are active participants in the knowledge-making process (Reid-Martinez & Grooms, 2021). Teachers create appropriate environments and provide materials, but the decision to determine what to learn depends on the students as they negotiate and choose how and what to engage with (Narayan, 2017); this method enables lifelong active learning and constant research. Self-determined learning is an important dimension of the constructivist model and a vital skill to have online; this is because of the speed at which technology and structural changes occur in communities and workplaces (Reid-Martinez & Grooms, 2021).

Technology influences the way we learn, seek and consume information (Narayan, 2017). Numerous learners of all ages take ownership of their learning with the touch of a screen. Heutagogy is highly valuable and can leverage digital technology's key affordances, widening learning possibilities since emerging digital tools enable learner-generated content and contexts (Aguayo, Cochrane, & Narayan, 2017). Heutagogy or self-determined learning is regarded as a net-centric theory that takes advantage of the endless possibilities achieved by technology, especially in distance education (Blaschke, 2012). Students create, study and influence each other online, developing and increasing skills as they use, learn, and explore the possibilities technology offers. The transfer of power and control that occurs because of this capability is less centrist and spread worldwide (Reid-Martinez & Grooms, 2021). The affordances of new tools allow face-to-face, blended, and online collaborations, and interactions of high quality, implying that the process is shared by the different parties. When learners are aware of their preferred method of learning and tools, they are more skilled at adapting new learning situations to learning styles, thus becoming more proficient, interested, and self-determined to discover new information (Whitlock, 2017). Heutagogy guides this research significantly as it supports learners' autonomy, and offers a framework for self-directed, net-centric and distant education (Blaschke, 2012). Technological advances' endless possibilities could take learning accessibility from a local to the global level, transferring power and control, which is the core of heutagogy.

2.3 Affordances in the Metaverse

Technology affordances are the number and quality of possibilities offered by a digital device, tool, platform or system. Technology affordance is the potential that exists between an aspiration and a concrete action (Mystakidis, 2022). This concept is based on what technology can offer and what users, students, and teachers can do, and know about the technology (Aguayo et al., 2017). It provides new and unique ways for users to interact and engage with new learning experiences to create, share, and connect globally with a wide range of subjects, with a sense of ease, and at a fast pace (Huang & Liaw, 2018). Perceptions of self-efficacy influence the perceived user-friendliness and usefulness of technology, and learning motivation (Huang & Liaw, 2018). Digital affordances facilitate the development of concrete learning outcomes, requiring the learner to take responsibility for the success or failure to achieve those goals. Thus, learners become active agents in the goal-oriented task determining the existence of those possibilities (Yeh & Wan, 2019). The same technology can offer different possibilities depending on the situation and potentialities for the learner's previous knowledge and literacy skills. Users can utilise technology beyond its known capabilities and create social learning which enables the creation of learner-generated content within learner-generated contexts. Well-designed digital technology allows authentic learning experiences to occur across diverse pedagogical frameworks and learning settings (Aguayo et al., 2017). As a result, students' ability to create, share, and present to others is heavily influenced by their understanding of the capabilities technology offers. Technological affordances enable the learner to take control, be responsible and be determined to learn anywhere, at any time (Narayan, 2017) by enabling choice in the learning process, which can change the whole experience (Banihashem, et al., 2021).

The metaverse is a decentralised, interconnected network of social and immersive environments on multiuser platforms, these combine physical and digital reality, which enables real-time communication (Mystakidis, 2022). It uses three-dimensional simulated worlds where avatars participate in political, commercial, societal and cultural activities based on everyday life (Park & Kim, 2022). The metaverse's affordance is ample, open and inclusive and connects people by creating virtual settings and experiences regardless of the device a person uses to access it, offering new opportunities to understand data via

visualisation on an extensive 360° view (Damiani, 2021). The metaverse is currently under construction and expanding rapidly (Park & Kim, 2022). Technologies such as virtual reality (VR) and augmented reality (AR) empower multisensory interactions with digital artefacts and people, and artificial intelligence (AI) is required to facilitate authentic worlds (Hwang & Chien, 2022). It envisions users interacting in embodied avatars or 3D holograms, in physical or virtual spaces, without restrictions (Mystakidis, 2022), and reducing discrimination in social connections.

The metaverse affordances enable learners to experience, explore, work and interact with people that they might not have the opportunity to in the real world. Furthermore, users are enabled to observe things from different perspectives or roles, as well as, at times, users are expected to create novel identities (Ayiter, 2019). Heutagogy (self-determined learning) and the metaverse technological affordances interrelate, as they encourage learner autonomy and facilitate learners' experiences that build competency and capability in formal and informal contexts (Mystakidis, 2022). Learners who are exposed to constructivist theories and approaches such as self-determined learning can achieve deeper understandings, critical thinking, and transferable skills as they are placed at the centre of the learning process.

2.3.1 The Metaverse's Digital Affordances in Educational Environments

There are numerous ways to apply the metaverse in education. The meta-education paradigm allows for rich, hybrid, online, virtual campuses where students own simulated spaces, co-create significant multimedia content, and can personalise curricula (Mystakidis, 2022). Collaborative virtual education permits constructivist learner-centred strategies such as project-based and game-based learning, as well as self-determined learning approaches, to be applied to a range of disciplines in relaxed and creative learning environments (Ayiter, 2019), engaging students in higher-order thinking through complex and authentic tasks (Hwang & Chien, 2022). In virtual contexts, students initially follow as passive receivers of information, this process eventually allows them to take an active role in their individual learning experiences, shaping the content flow, which is an important aspect of heutagogy (Blaschke, 2012; Reid-Martinez & Grooms, 2021). Self-determined education aims to make

the most of emerging technologies such as the metaverse and its unique affordances and apply them in the delivery of learning experiences to support the development of learner-generated content in self-directed learning contexts.

Cultural content is fundamental to offering immersive experiences through well-structured stories and user-created events (Park & Kim, 2022). In language learning, the metaverse transcends the confines of a course or an activity as it provides learners with opportunities to live as an L1 of the target language, fully immersed in it, using it for working and learning and engaging in social interactions to have fun (Hwang & Chien, 2022). The metaverse enables simulations of learning that require long-term engagement, practice and resources (Hwang & Chien, 2022). For example, Second Life, the first metaverse virtual immersive platform launched in 2003, allowed users to network and learn grammatical structures from native speakers more readily due to the chat features. It also provided opportunities to expand second language proficiency and understanding of cultures and promoted cross-cultural bonds. As a result, learners attained a sense of self-assurance while interacting with L1 speakers (Diehl & Prins, 2008; Yeh & Wan, 2019). In addition, Second Life was the first metaverse space that allowed its content creators to keep and capitalise on their intellectual property (Ayiter, 2019). The metaverse gives control, ownership and autonomy back to individual users and creators (Damiani, 2021). Language learning in the metaverse enables students to have a *second life*, a digital environment where they can use the target language, be part of social events, interact and be present long-term as in the real world (Hwang & Chien, 2022). Envisioning the potentiality and possibilities that new technology may provide, in some cases not available yet, might enhance the teaching and learning of various educational processes.

2.3.2 Immersiveness and Presence in the Metaverse

The metaverse aims to be accessible, delivering a sense of presence for all involved, improving remote sharing and collaborative work and creating infinite spaces to interact, visualise and comprehend information (Taylor, 2022). This is achieved through “the feeling of presence … the sensation of existing in the digital environment … [which] relates to attention, motivation, learning, and ultimately behavioural change” (Howard et al., 2021, p .3). When learners actively involve different senses, ideal settings are created leading to

positive learning outcomes, increasing literacy skills and cognitive engagement as storing and memorising are affected (Lege & Bonner, 2020). By knowing the metaverse's potential and what one could achieve, "learning processes occur practically anywhere in collaboration with anyone, promot[ing] innovative, inclusive, and transformative learning that challenges traditional pedagogical approaches" (Aguayo et al., 2017, p. 27). The metaverse enables learning processes in receptive, immersive and meaningful ways and provides a novel standpoint on educational technology, with new training opportunities and experiences for learners.

2.4 Social Learning Theories and Virtual Language Learning Environments

Digital language learning provides opportunities for students to engage with L1 speakers around the world despite the geographical distance (Tolosa et al., 2021). The literature suggests various cognitive benefits when applying constructivist-based learning theories such as social constructivism and heutagogy to VLEs (Alizadeh, 2019; Bonner & Lege, 2020; Reid-Martinez & Grooms, 2021; Whitlock, 2017; Yeh & Wan, 2019). These studies demonstrate that cross-cultural alliances formed in VLEs reduce learners' anxiety, increase cultural awareness, and enhance engagement in distance learning (Azar & Tan, 2020; Berti, 2021). Digital learning platforms offer outstanding visuals and immersive elements which facilitate memorisation as well as opportunities to converse and collaborate with L1 speakers. This collaborative culture allows learners to constantly interact with content, instructors, peers, and external sources, and each interaction reinforces collective knowledge-building as everything is equally accessible, giving learners a greater sense of autonomy (Reid-Martinez & Grooms, 2021).

Language acquisition occurs through dialogue and negotiation of meaning (Blasing, 2010), and online interactions are a common way to collaborate in digital settings (Chen, Wang & Wang, 2022). Languages students in immersive virtual situations are more willing to connect, learn, work together, and practise grammatical structures from interactions with L1 speakers due to the written capabilities of the chat and self-correction features, decreasing fear, and anxiety and producing a greater sense of control over the collaborative

work (Blasing 2010; Swartz et al., 2020). Collective work increases learner satisfaction, engagement and self-drive by allowing autonomy and creativity to direct learning (Ní Chiaráin & Ní Chasaide, 2018).

Computer-assisted communication positively impacts students' willingness to interact with L1 speakers as it reduces language anxiety, improving communicative and cultural skills through the introduction of unrestrained tasks (Papin, 2018). Vocabulary learning is significantly improved via meaningful communication and immediate feedback (Tai, Chen & Todd, 2020). Students physically experience the culture by hearing accents, meeting people from the target language, exploring the location, and interacting with distinct cultural aspects in ways that are not yet achievable through other media, allowing users to be better culture and language learners (Peixoto et al., 2021). Anonymity can also facilitate collaborative learning, decreasing the anxiety and inner self-awareness of exposing imperfect knowledge of the spoken language (Utami et al., 2021). Freedom to verify and explore pronunciation or meaning on other applications such as electronic dictionaries enhances learner autonomy.

2.4.1 Self-directedness

Self-determined learning requires learners to be accountable for their successes and failures as they are active agents within tasks (Yeh & Wan, 2019). These experiences create conditions to change existing knowledge and construct new understanding (Chen, 2009). Digital language learning produces self-directed learning skills as these experiences enhance students' engagement and self-paced strategies (Tolosa, East, Barbour & Owen, 2017; Tolosa et al., 2021). The accessibility of remote learning materials and authentic language usage offers a flexible self-directed, distance-learning approach, leading "to higher cognitive engagement and increased motivation, as compared to traditional classroom learning" (Berti, 2021, p. 64). Immersive platforms promote a sense of determination that learners appreciate, improving perceived learning results and allowing time to focus on materials they consider important, increasing learner satisfaction, and stimulating them to use the foreign language in different contexts (Berti, 2019; Kaplan-Rakowski & Gruber, 2019; Xu, Huang, Wang & Heales, 2014). Active involvement improves learning outcomes and

increases lifelong self-determined learning skills which are associated with academic success in online learning (Banihashem et al., 2021).

2.4.2 Immersiveness and Presence in VLEs

Virtual language learning environments combine authentic interactions to create immersive learning (Meri-Yilan, 2019). Learning in engaging simulated surroundings triggers prior knowledge and connects it to the latest information, with the student gaining practical experiences from the immersion process (Yeh, Tseng & Heng, 2022). Communicative opportunities in authentic cultural environments, without time and space limitations, help acquire cultural knowledge and develop global skills. The multisensory incentives enabled students to visualise, comprehend and reconstruct their knowledge (Tai et al., 2020). The feeling of physically being in the same space with others to create learning experiences can lead to memorable, retainable and contextualised language use (Kern, 2022). Cognitive benefits from authentic situations in VLEs can improve memorisation and application of content; these benefits are obtained through the feeling of presence which enables active, controlled learning and motivation to study (Meri-Yilan, 2019).

2.4.3 Motivation to Learn

Language classrooms should make positive contributions to students' motivation to learn. This is achieved by making the content interesting, enjoyable, and relevant to learners' age and abilities, and by considering accessibility to digital resources (Lightbown & Spada, 2006). Motivation is the incentive students get after achieving a task on their own (Cho, 2018). Learners who are encouraged to enjoy learning using technology experience satisfaction as well as reward-driven behaviour, which is motivation to participate in specific activities, positively influencing the intention to continue e-learning (Huan & Liaw, 2018). Motivation can be boosted by designing activities or language learning resources that promote experimentation, exploration, reflection and enjoyment while learning has a positive long-term impact on the student's drive to learn (Allcoat et al., 2021). Unmotivated students "learn vocabulary, grammar, and pronunciation as much as they deem necessary" (Cho, 2018, p. 19). The Aotearoa New Zealand context is one where learner-centred, experiential and co-constructive pedagogies are supported, making "L2 classrooms places learners [should] enjoy coming to" (East, 2012, p. 144).

2.5 Pedagogical Considerations for Good Practices

Pedagogical considerations such as the analysis of content, learner attitudes, scaffolded learning objectives, and appropriate implementation and use of technology are crucial in the design of online learning activities (Tolosa et al., 2021). It is difficult to evaluate activities if they lack a clear pedagogy based on the underlying instructional design, since the methodology itself may be unsuitable for virtual learning. (Lege & Bonner, 2020). Language instructors and the technical design team are equally significant when creating and implementing VLEs (Fryan, 2015). Pedagogical awareness and technical expertise are required to extend the benefits of teaching and learning digitally (Aguayo et al., 2017). Technology designers, developers, educators, researchers, practitioners and end-users should work together to construct learning platforms considering methods that work within the constructivist and intercultural frameworks, as these are multifaceted, insightful educational theories that recognise the complexity of the unpredictable, ever-changing social, cultural and learning contexts. Some issues with VLEs relate to technical processes as they lack user acceptance due to the absence of user contribution (Fryan, 2015).

2.5.1 Instructor Training

Due to constraints caused by the COVID-19 pandemic, several establishments have moved to online platforms. As a result, students learn about intercultural competence via a screen whereas they would conventionally cover it through study abroad, course work or extracurricular activities. Nevertheless, overseas experiences do not necessarily lead to having ICC, as stereotypes and generalisations can be created without critical analysis (Ramirez, 2021). Students and teachers need training opportunities to develop their ICC to ensure equal access to becoming global citizens. Teachers' inexperience and unfamiliarity when imparting online lessons, with no assistance, training or preparation, are potentially restricting authentic intercultural teaching (Akdere et al., 2021). The absence of adequate technology integration training, the lack of strategies to incorporate digital platforms in the classroom (Whitlock, 2017), and the expectations of effectively supporting learners to develop ICC without fully understanding or having experienced what this entails (Ramirez,

2021) can hinder learning experiences. Teachers' digital knowledge means that information can be expressed and delivered in ways that learners can thoroughly understand and enjoy. Knowing how to use technology to maximise learning depends on accessibility to devices (Aguayo et al., 2017). The rapid changes in technology expose the need for up-to-date information on ICC and technology integration to be made available to educators looking to utilise virtual platforms as classroom resources.

2.5.2 Lack of Intercultural Digital Learning Resources

Digital learning is exciting and inevitable. However, the literature shows that technology is mostly utilised to offer interactive materials rather than encourage participants to critically engage in thinking, risk-taking, problem-solving and exploration of the unknown. Cultural learning and content in digital language learning are almost non-existent and are mainly about memorising facts that do not engage students in critical reflection or improve communication (Azar & Tan, 2020; Yeh et al., 2022). The central dispute is that VLEs are "primarily designed for entertainment purposes" (Azar & Tan, 2020, p. 56) and to transfer electronic documents, and are not utilised to their full potential (Fryan, 2015). Ideally, the incorporation of digital platforms in education should be guided by solid curricular design principles based on acquiring competencies required in academic contexts (Cochrane et al., 2017). This should encourage teachers to contemplate creative and innovative ways in which tasks and activities can be designed, supporting the claim that well-constructed virtual activities and resources might powerfully intervene in the process of language acquisition (Buliva, 2018). Additionally, welcoming emerging technologies is vital for student retention (Tolosa et al., 2021).

2.6 Key Points

To summarise, language connects and influences culture and identity. Languages facilitate interactions with different people across cultural boundaries (Byram, 1997); as a result, one can explore and analyse their surroundings and behaviours (Newton et al., 2010). When students engage in meaningful activities, knowledge is constructed rather than enforced; prior knowledge is organised by the context in which the learning occurs (Chen et al., 2022). Eventually, reflections on meaning are scattered across social tools, culture and community,

however, language is the most valuable tool of all. Through interactions in virtual spaces, students can apply knowledge by responding to a virtual problem or scenario, gain knowledge and skills that enable them to revise prior ideas, develop innovative approaches, and compare views with and towards others. VLEs built on constructivist views can offer opportunities for students to improve ICC and encourage learner autonomy and lifelong learning. Chapter 3 introduces design-based research (DBR) as the methodology guiding this study.

3. Methodology

This chapter covers the methodology, methods and procedures utilised in this study to prototype a resource for the Spanish language classroom based on the metaverse. Design-based research (DBR) is presented as the guiding methodology, and its potential benefits when creating a VLE for language acquisition are outlined in four phases. Lastly, the four phases of the practical research – data collection, participants' information, ethical concerns, and overall trustworthiness – are explained in detail.

3.1 Theoretical underpinnings

This investigation adopts a naturalistic paradigm from constructivist and interpretive approaches suitable for the creation of an interactive virtual platform, as its philosophical perspectives and standpoints of exploration served the purposes of this study. As a constructivist approach, the naturalistic paradigm enables qualitative and subjective methods to be used and predominate in studies, although quantitative techniques may also be utilised (Mackenzie & Knipe, 2006). Moreover, it views phenomena as occurring in their natural state, as opposed to positivist paradigms, which rely on manipulating the environment and context-less data (Aguayo, 2014). The context of inquiry is critical to understanding and interpreting realities. The naturalistic paradigm allows researchers and practitioners to study variables and the complexity of their settings as they occur (Narayan, 2017). By interpreting participant accounts, researchers gain a deeper understanding of the human and social world (Rodríguez, 2017). The main difference from positivism is that researchers rely on interpreting participants' perspectives and consider the impacts of their backgrounds and experiences as the source of knowledge (Mackenzie & Knipe, 2006). New

information is grounded in authentic educational contexts, which can be applied to impact educational procedures (McKenney & Reeves, 2013).

The engagement and negotiation between the researcher and participants are central to naturalistic research. Methods such as open-ended interviews, questionnaire surveys, observations, document review, Google Analytics tools, and visual data analysis are recommended (Mackenzie & Knipe, 2006).

3.2 Design-based Research

Design-based research (DBR) is a methodological framework widely used in educational technology research that approaches practical issues and challenges in the search for solutions in four stages. Firstly, DBR involves an initial analysis of a real-life challenge or problem with researchers, practitioners, end-users and field experts. Consequently, pedagogical innovations go beyond the success or failure of a product, leading to the creation of practical knowledge (Pardo-Ballester & Rodríguez, 2009). The research is conducted in a participatory manner – that is, researchers and practitioners work together towards a common goal, creating, refining and improving a design through constant enquiry (Rodríguez, 2017). DBR improves instructional practices by iteratively analysing, designing, developing and implementing educational solutions and programmes in a continuous manner that addresses real-life issues. Continuous evaluation in naturalistic settings is emphasised during the research process, involving authentic users to create design principles that can direct similar studies and innovation development (Amiel & Reeves, 2008). Resources designed within DBR tend to result in products that are sensitive to the content of language instruction, suitable to meet learners' diverse needs, and optimal for language acquisition because of the iterative testing from a varied group of contributors (Pardo-Ballester & Rodríguez, 2009).

The application of DBR in the development of resources for the language classroom includes considering characteristics such as linguistic features, authentic interactions, three-dimensional audio, digital affordances, and instant feedback. DBR's interdisciplinary approach allows material designers to work on language learning products from different angles simultaneously (Pardo-Ballester & Rodríguez, 2009). When instructors' and learners'

perspectives are considered in the design process, the focus is not only on producing language learning resources but also on constructing meaningful user experiences. For instance, developers learn valuable information about language students that may inform the production of teaching materials (Pardo-Ballester & Rodríguez, 2009). Theoretical understanding of second language learning, authentic interventions, relevant design principles, as well as professional development, are important outcomes achieved by applying DBR as a methodology (Reeves & McKenney, 2013). DBR guidelines applied in the creation of learning resources to second language acquisition (SLA) or computer-assisted language learning (CALL) frameworks afford excellent opportunities as pertinent language findings in the production of materials are incorporated, providing a lens to design, test and improve materials within authentic settings (Reeves & McKenney, 2013). Expert contributions facilitate the development and evaluation of innovative products, creating a solid connection between educational research and real-world issues.

DBR aims to shift research from laboratories into classrooms and create awareness about innovative work in practice; and to reveal how the possibilities and limitations of a design can inform theories of learning (Dede et al., 2004). Appropriate design strategies and analysis in genuine surroundings communicate the importance of practitioners', users' and investigators' interpretations and refine information on the issues involved (Dede et al., 2004). The methodology is flexible and receptive to context as research tends to occur in "naturalistic learning settings, which are typically dynamic, messy, and extremely challenging to capture and replicate" (Rodríguez, 2017, p. 368). Moreover, researchers do not commonly work directly with practitioners or practitioners with participants; normally, their involvement is limited, and they benefit from the research when completed (Amiel & Reeves, 2008). The lack of theoretical principles, use of technologies such as digital environments, and methodologies concerned with everyday practice are concerning issues (Narayan, 2017). Participatory enquiry expects contributors to be actively involved in the design process and rejects the notion of practitioners being consumers of the research upon its completion (Rodríguez, 2017). Simply put, prototype models are built by joining theory, real-life needs, and design principles with authentic users and settings to inform local practice and close the gap between research and application, to generate further insights.

3.2.1 Four-Phase Sequence

DBR methodology is characterised by inquiry and teamwork; its collaborative nature creates meaningful experiences, and professional development is an important output as researchers and practitioners seek to fulfil complementary roles (Rodríguez, 2017). Iteration provides a longitudinal and cyclical quality to the methodology, which is a distinguishing feature when informing the wider community of findings. Iteration also allows for the ability to adapt to changing conditions, new knowledge, and new and emerging learning technologies, providing a flexible methodological framework that can rapidly incorporate novelty (Aguayo, Eames & Cochrane, 2020).

In sequential order, researchers, practitioners, and end-users analyse a real-life challenge to recommend suitable solutions via constant evaluation (Cochrane et al., 2017). As Figure 3.1 shows, this study implemented a four-phase sequence:

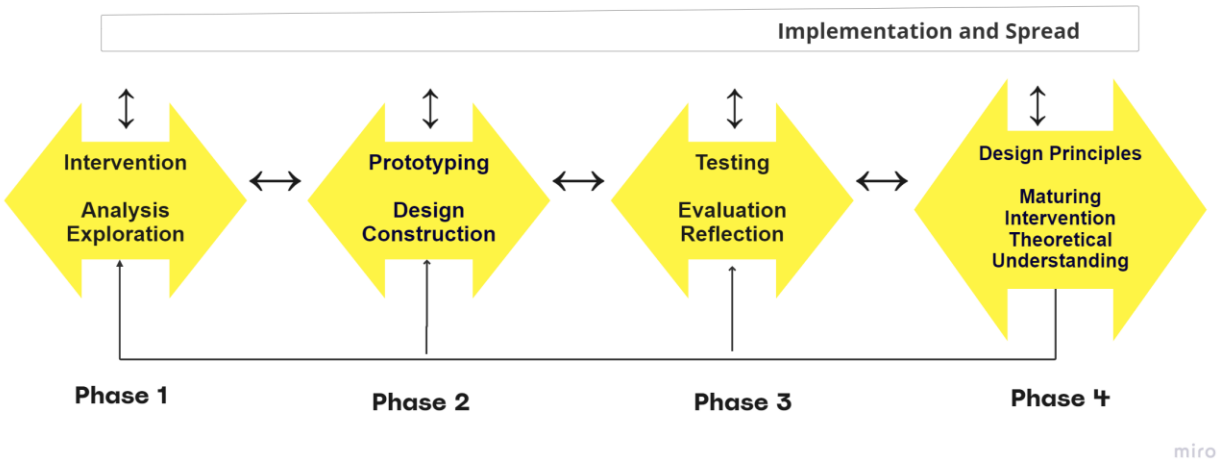
1. Phase 1 is often referred to as the intervention (Reeves & McKenney, 2013). This is when analysis and exploration of the problem, literature review and involvement of expert practitioners occur (Narayan, 2017). Sometimes, this phase involves data collection to gain a better understanding of the real-life challenge or problem, for example interviewing practitioners or end-users, and document analysis.
2. After understanding the issue, in Phase 2 a solution to the problem is collectively designed and constructed in the form of a prototype (Rodríguez, 2017). The development of emerging design principles is refined by the understanding of theoretical, practical and technological innovation in the form of iterative prototyping (Aguayo et al., 2020).
3. In Phase 3, the prototype is presented to the panel of experts for evaluation and to obtain their reflections. The product is tested in practice in authentic contexts to gain appropriate feedback and data on usability and content. Information is re-evaluated and reflected upon. A new set of strategies or information can be gathered and applied to potential defects (Pardo-Ballester & Rodríguez, 2009). This phase produces influential data to improve the initial issue (Narayan, 2017) and accomplishes professional development for all those involved in the process (Reeves

& McKenney, 2013). This testing process can occur iteratively until a final solution is conceived.

4. In Phase 4, design principles emerge in practice to inform the educational research and practice, maturing the initial intervention and increasing opportunities for solution implementation (Aguayo et al., 2020). This phase presents the learning environment enhanced by theoretical understanding and findings of the entire prototyping process (Rodríguez, 2017). Emerging design principles can later be disseminated and transferred to other similar settings for further evaluation and development of theoretical and practical knowledge.

Figure 3.1

Four Phases of Design-Based Research



3.3 Research Design

The research design is based on the DBR four-phase sequence presented in the previous section. During each phase, data were collected following different quantitative and qualitative methods and approaches.

3.3.1 Participants – The Panel of Experts

Participants of this research were invited to join a panel of experts and be involved in Phases 1 and 3 of this study. Most members of the panel were in Aotearoa New Zealand

except for Javier, who was overseas. Table 3.1 shows the panellists' pseudonyms, expertise, and levels of proficiency in Spanish to illustrate the demographics of the participants of this research.

Table 3.1

Panel of Experts

Pseudonym	Expertise	Spanish Proficiency
Marcos	Student of Spanish	L2 Speaker
Teresa	Student of Spanish	L2 Speaker
Santiago	Educational design specialist/ Tertiary lecturer	L2 Speaker
Javier	Overseas high school teacher	L1 Speaker
Sofia	Primary school teacher/ Tutor one-on-one Spanish adult conversations	L1 Speaker
Antonia	ICC and language teaching tertiary lecturer	L1 Speaker
Sergio	Educational technology tertiary lecturer	L1 Speaker
The primary researcher	High school language teacher	L1 Speaker

3.3.2 Data Collection

For this study, a mixed-method research design that involves an interpretive qualitative approach was adopted. This design is grounded on a constructivist learning scheme which is personalised and informed by people and their conditions. Additionally, different quantitative methods such as questionnaires were used to collect and organise data from the evaluation of the VLE prototype.

Qualitative research methodologies are often associated with naturalistic and interpretive educational inquiry, and voice participants' subjective opinions, offering reliable interpretations to decipher sources of data. This is important because social phenomena are perceived and constructed by people's worldview of reality (Cohen, Manion & Morrison, 2007). Qualitative methodologies provide opportunities to seek and explore a profound understanding of experiences not available through quantification (Narayan, 2017). Quantitative statistics, meanwhile, reveal findings on the relative efficiency of learning theories (Dede et al., 2004). Quantitative methods are characterised by decoding numerical data (La Pelle, 2004).

Part of the qualitative data was collected through the panel of experts' online discussion using indicative topics (see Appendix 6). Discussions were voice-recorded, transcribed and analysed following a naturalistic approach to assess and co-construct the framework. The rest of the qualitative data was collected via a usability and content questionnaire (see Appendix 7). Quantitative data for this study was gathered using the usability and content online form. The online survey was developed and sent to participants using a Google Form containing a 5-point Likert scale questionnaire.

3.3.3 Phases of Practical inquiry

The four phases of DBR were implemented in this research in the following way:

1. In Phase 1 (intervention), the panel of experts was set up and met online with the researcher to analyse and discuss how ICC could be facilitated and promoted through language learning in digital education, considering distance learning and student-centred theories. This process led to the development of a set of early

design principles and solution ideas. The panel's collaborative analysis was recorded and documented using Google Meet and documents were shared via Google Drive.

2. In Phase 2 (prototyping), the VLE prototype was developed with a focus on promoting language practice in diverse contexts and revised through iterative prototyping and testing. Video performances of an L1 speaker in an authentic environment were recorded, and footage was edited and uploaded to a platform in the metaverse.
3. In Phase 3 (testing), the prototype was presented to the panel of experts for feedback on its potential usability and content. Quantitative and qualitative data were collected via an online survey to investigate users' experience with the prototype and its usefulness.
4. Phase 4 (maturing intervention) identified design principles through interpretation of results, reflection and assessment against the existing relevant literature on theories that support ICC in language learning, mobile educational technologies, and student-centred and self-directed learning theories, these being key theoretical concepts informing this study.

3.3.4 Thematic Analysis

Since qualitative data analysis relies on interpretation, there are many ways to understand findings. In this study, qualitative data from Phases 1 and 3 were analysed by developing a theme codebook method (La Pelle, 2004). This involved reading the transcribed versions of the online discussions and responses in the usability and content form and noticing significant topics that seemed to reappear. Data were sorted using Otter.ai[1], which is a voice recorder and real-time transcriber. The summary keyword feature was used to group items coded under themes. The codebook combined theoretical and practical aspects related to the research questions and recurrent topics from the data.

Quantitative data analysis was carried out using Google Form Analytics. These statistics addressed concerns about the prototype's content and usability and provided demographic characteristics about the panel of experts. The purpose of this was to provide methods to

[1] https://otter.ai/

ensure data validity, for example by triangulating qualitative and quantitative data from a variety of data collection methods, data types, and experts.

3.4 Ethics, Validity and Reliability Considerations

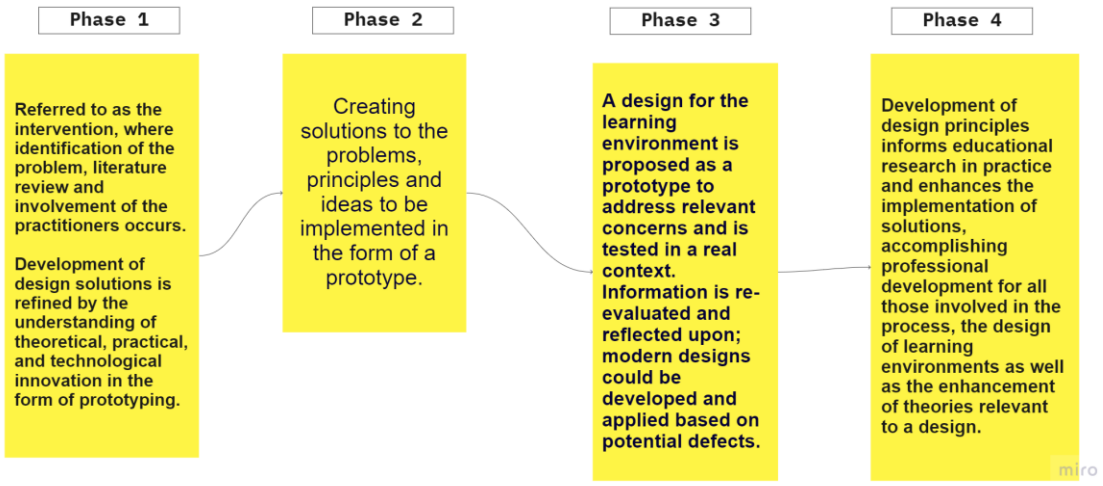
Ethical considerations were addressed in this research. Research ethics approval was obtained from the Auckland University of Technology Ethics Committee (AUTEC) on 27 June 2022 (AUTEC reference 22/98). An overview of the research (Appendix 1), an information sheet about the study (Appendix 2), and consent forms (Appendices 4 & 5) were given to all participants and collected before Phase 1. To ensure confidentiality, all participants' data were de-identified and pseudonyms were assigned.

Validity and reliability are vital concerns and requirements in this educational practice-based research. Philosophical perspectives, methodological approaches and criteria used to judge can determine the quality of the research (Cohen et al., 2007). To achieve and augment rigour, VLE designs should be influenced by theories of how people learn, which are present and grounded in relevant theoretical literature (Rodríguez, 2017).

In qualitative research, reliability is measured by the accuracy and comprehensiveness of collected data in the natural setting. Besides the reliability of a real-life inquiry, participants' authenticity, honesty, depth and meaning are important to emphasise understanding (Aguayo, 2014). The prototyping phases of DBR, in which a design is refined to gain a more informed understanding, are used to ensure reliability, which is the extent to which implementation and repeated testing of a solution produce expected outcomes (Rodríguez, 2017). A summary of the DBR process appears in Figure 3.2.

Figure 3.2

Summary of the Design-based Research Process



3.5 Key Points

This chapter has outlined the methodology used to create a prototype for this project-based research. DBR can be used to acquire the latest information from authentic settings to solve practice issues. The four phases of DBR were presented and participants in the study were described. Subsequently, the data collection methods were described. Next, the steps taken to develop a digital interface to learn the Spanish language and culture were outlined in four phases. The following chapter documents and presents a critical reflection on the data obtained by this study.

4. Data and Critique of Practice

This chapter describes and explores the process to develop a prototype of a VLE for the Spanish classroom. Additionally, it presents the findings obtained from the four DBR phases, design principles that emerged, and challenges to realise the artefact. Consequently, the data are discussed and the identified areas for improvement and suggestions from the panel of experts are examined and implemented. This research aimed to find out to what extent a VLE based on the metaverse could facilitate Spanish language learners' ICC. The findings show that the virtual world prototyped as an educational resource facilitated Spanish learners' ways to recognise intercultural communicative opportunities in everyday situations, which could potentially increase their competence.

The VLE prototype developed in this study features interactive immersive spaces in the metaverse containing videos of a Mexican actress performing as Frida Kahlo, with each scene connected symbolically or explicitly to at least one of the artist's paintings. The paintings float on either side of the videos (see Figure 4.1). Thus, a series of auditoriums and galleries were designed in the metaverse for students to learn about Frida's life and art chronologically. These spaces contain scenes with related tasks which encourage communicative competence and invite learners to expand their general cultural knowledge of Latin American communities by working collaboratively as avatars.

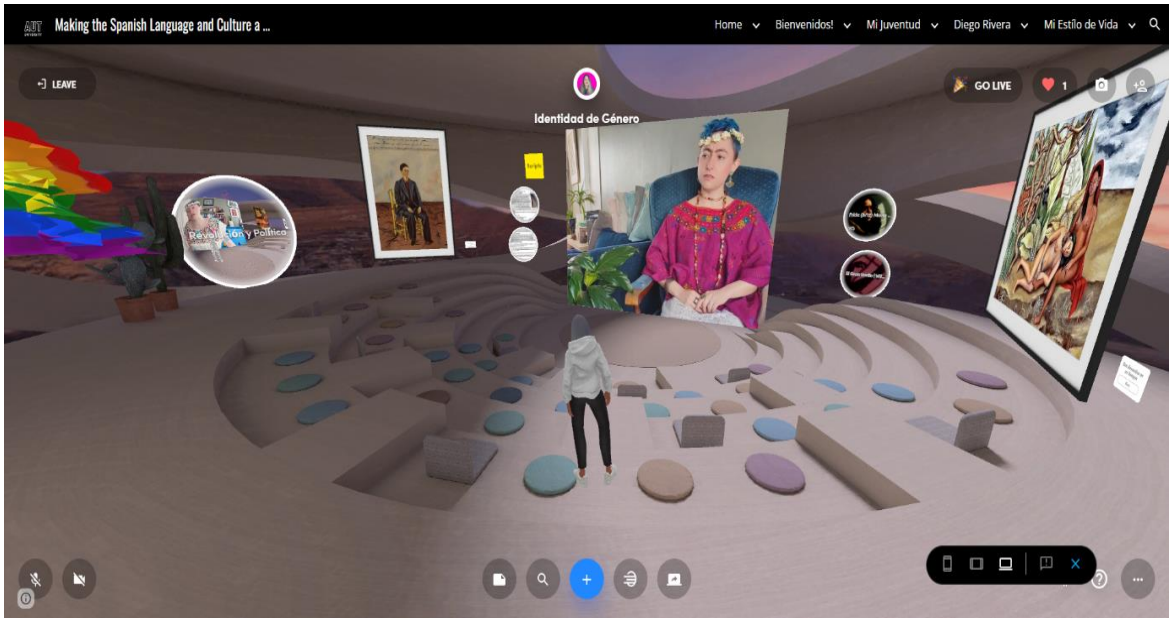
The VLE prototype provides users with opportunities to (1) continue learning beyond the classroom at their own pace by clicking and following referencing sources (see Figure 4.1); (2) reflect on cultural aspects such as idioms, proverbs, symbols, Hispanic songs to increase ICC; (3) experiment with the arts and technology in the metaverse; (4) develop accuracy in listening skills and recognising meaning in body language by watching the videos; and (5) use and recycle Spanish vocabulary with confidence to produce original content. These characteristics are supported by findings from the literature which led the study to a set of design principles guiding the VLE model. The prototype is hosted on Spatial,[2] a metaverse platform which supports virtual reality (VR), augmented reality (AR) and three-dimensional

[2] https://www.spatial.io/

(3D) features, and requires users to create full-body avatars to navigate and generate content as well as connect with others free-of-charge (see Figure 4.1).

Figure 4.1

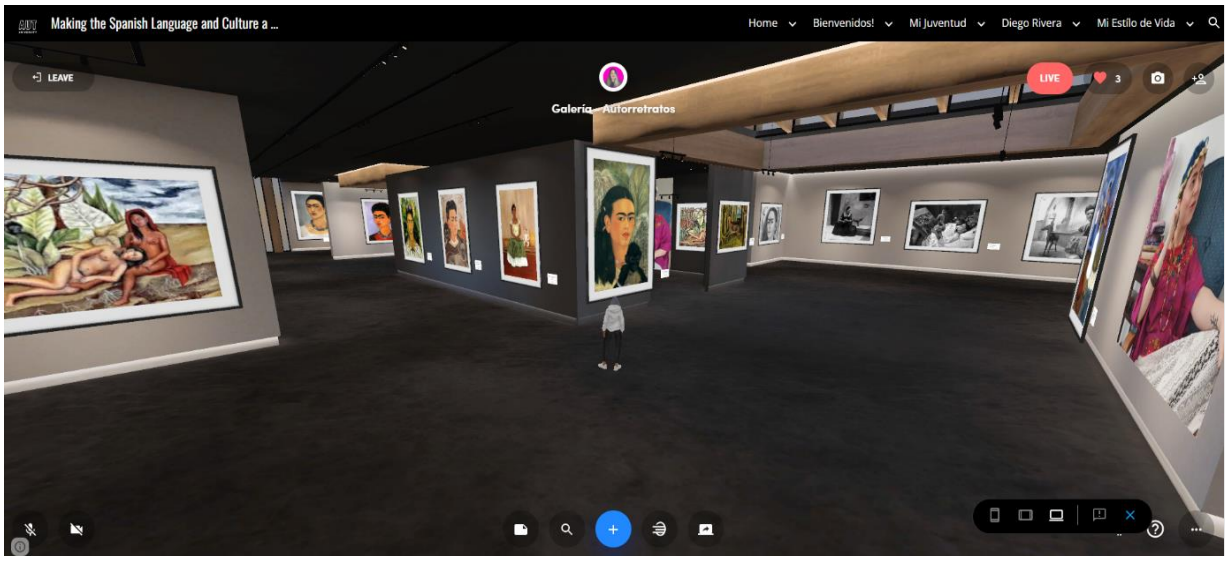
Gender Identity Auditorium



Note. Full-body avatars are used to navigate the platform.

Figure 4.2

Self-portrait Gallery



Note. All paintings have an information panel with outside sources for further self-directed research.

Next, the discoveries, processes and decisions undertaken following the DBR four-phase approach to developing a VLE are described in detail.

4.1 Phase 1 – Understanding Spanish Language, ICC and VLE Issues and Challenges

Key steps taken in Phase 1 are sequentially summarised in Table 4.1. In Phase 1, I initiated a review of contextual knowledge and conducted a comprehensive literature review to identify and understand specific areas of theories such as ICC, constructivism, and heutagogy (Chapters 1 and 2). DBR was selected as the methodology to approach this educational enquiry as its four phases suited the project (Chapter 3). Additionally, the exploring of different possible digital tools, platforms and affordances, selecting a virtual environment and recruiting a panel of experts commenced in this phase.

Table 4.1

Phase 1 – The Intervention

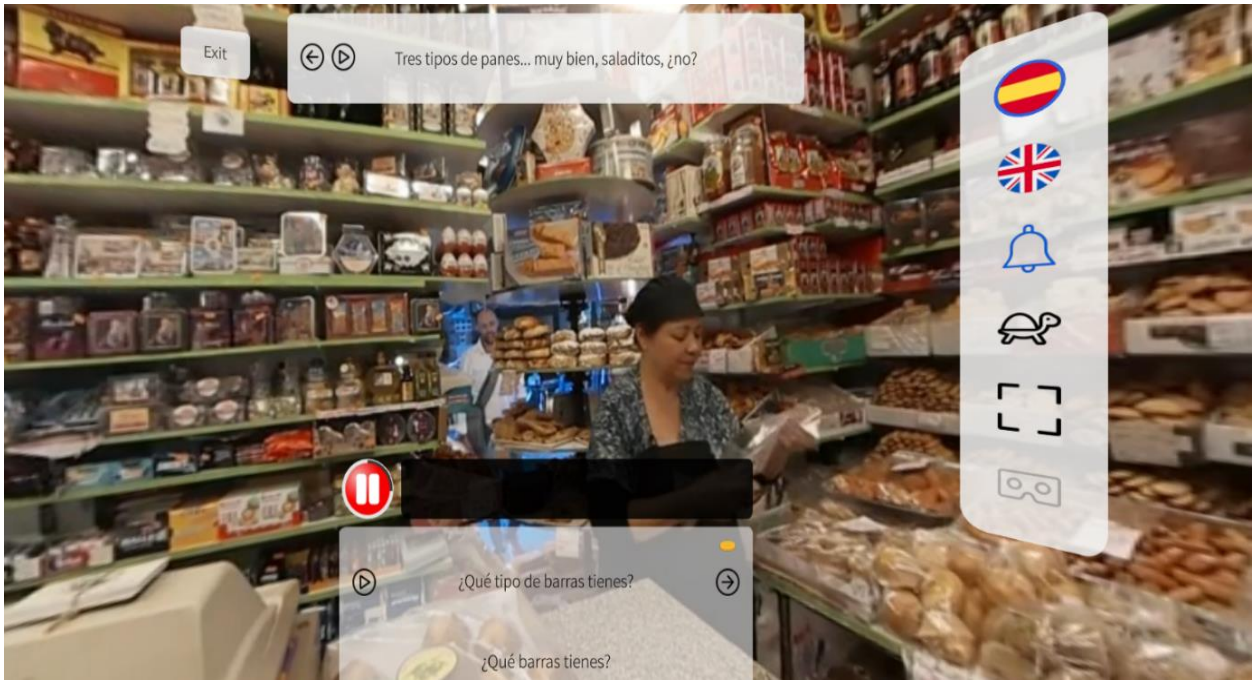
Initial Research	✓ Review of contextual knowledge ✓ Comprehensive summary to identify specific theories ✓ VLE investigation ✓ Research Question ✓ Early design principles
Script, Unit and Lesson Plan	✓ Investigate Frida Kahlo's life and art ✓ Devising monologues ✓ Identifying lesson objectives ✓ Task creation
Panel of Experts	✓ Promotion of study ✓ Participants recruitment ✓ File sharing ✓ Collaborative Discussion and Reflection
Mexican Actress	✓ Recruitment and location scout

The idea for this project was first inspired by ImmerseMe,[3] which offers VR-based language instruction by using 360° videos of real people and locations. However, several other video hosting and educational platforms were explored because ImmerseMe is members-only and does not offer video hosting features (Figure 4.3). YouTube was initially considered since it is a free platform on which video tutorials are universally used for self-directed learning. YouTube is well-known and user-friendly, and makes the uploading and playing of 360° spherical videos accessible on different devices; they can also be embedded on Google Sites. However, YouTube was not compatible with the platform ultimately selected. Platforms offering mixed reality (MR) affordances, where simulated and digital elements interact, were also considered. Mozilla Hubs[4], for example, uses MR technology, creating virtual spaces which can be occupied and visited by users in the metaverse; however, developing spaces can be challenging and it does not offer avatar features. Likewise, Genially [5]was investigated for its escape room capabilities since students solve mysteries using prior knowledge to become protagonists of a story, but it was discarded as it does not support extended reality (XR) attributes such as VR. Lastly, Spatial, an XR platform that embraces MR, AR, VR, 3D, and avatar features, was chosen as the preferred hosting site since users can display innovative material, create intimate communities, and explore visionary digital art. This permits the sharing of knowledge streamed in real-time, free-of-charge or by subscriptions for advanced hosting features.

[3] https://immerseme.co/
[4] https://hubs.mozilla.com/
[5] https://genial.ly/

Figure 4.3

ImmerseMe



Simultaneously, poster ads, invitations and information sheets about this study were created to recruit participants. Once potential participants responded to my ads and/or expressed their interest in participating in my research, I sent them a project timeline and related information and a consent form to return signed before the start of their participation. Two Spanish students, two teachers, two educational technologists, and a language teaching academic were recruited by the end of this process (see Table 3.1). The panel of experts online session was then scheduled on Google Meet in which emerging design principles, theories and pedagogical frameworks were discussed as well as ways to implement them in a Spanish classroom resource.

In Phase 1, I also began devising a script following Frida Kahlo's life in 13 scenes, each referring to one of her paintings. Table 4.2 shows four parts organised chronologically containing three to four scenes and referencing paintings about Frida's life. Furthermore, Level 2 and 3 NCEA requirements suggested vocabulary, language structures such as tenses, grammar points, idioms, and proverbs, and famous quotes by Frida were added to the monologues. Frida's beliefs, expectations and reactions to specific situations were disclosed in the script as well as her achievements, sufferings, struggles and her contributions to society. The panellists had access to the script and were encouraged to provide feedback on

language usage, cultural features, and other aspects and ideas to use the script creatively before, during and after accessing the site. The feedback provided was implemented in the last version of the script.

Before the online discussion, a Google Drive folder was created and shared with the panel of experts which contained (1) an introductory project video explaining the study, (2) a Miro [6]e-board to brainstorm and map ideas; (3) indicative topics and questions for online discussions (Appendix 6); (4) an e-learning storyboard (Appendix 8); (5) Frida's scripts (Appendix 9); (5) a unit, a lesson plan and a teacher's guide that included lesson objectives and tasks related to scenes (Appendix 10); (6) references to virtual platforms; and (7) an unpublished Google Site used to test and embed other sites. All participants had access to these documents and were encouraged to contribute to improving them throughout the process.

During the online session, panellists recommended directing the actress to utilise non-verbal reactions, body language, and gestures as much as possible for users to input unscripted questions and examine physical signs and cues when communicating ideas, which would contribute towards learners' development of ICC.

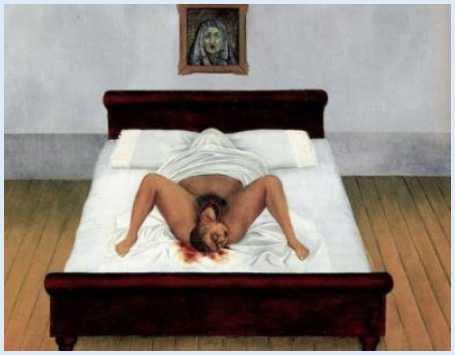
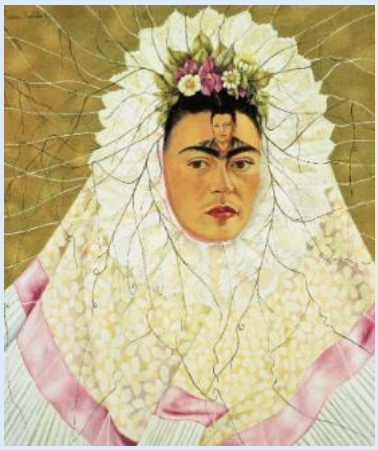
At the end of this phase, a professional Mexican actress was recruited, the feedback from the online session was transcribed and examined using a free version of the Otter app, which also facilitated the identification of emerging themes and keywords, and some design principles started to consolidate and were refined.

[6] https://miro.com

Table 4.2

Scenes and Reference Paintings

Part One	Part Two
1. Bienvenidos – Welcome *Two Fridas, 1939.*  **2. Familia – Family** *My Grandparents My Parents and Me, 1936 and,* *Portrait of Frida's Family, 1950.* **3. Niñez – Childhood** *Girl with Death Mask, 1938.*	**4. Juventud – Youth** *Self Portrait in a Velvet Dress, 1926.*  **5. Un accidente horrible – A horrible accident** *The Broken Column, 1944.* **6. En cama postrada – Bedridden** *Without Hope, 1945 and* *The Dream/The Bed, 1940.*

Part Three	Part Four
7. **Diego Rivera** *Frieda and Diego Rivera, 1931.* 8. **Mi segundo accidente – My second accident** *A Few Small Nips, 1935.* 9. **Fertilidad – Fertility and miscarriages** *My Birth, 1932 and Henry Ford Hospital, 1932.* 	10. **Mi estilo de vida – My lifestyle** *My Dress Hangs There, 1933 and Memory, the Heart, 1937.* 11. **Identidad de género – Gender identity** *Two Nudes in a Forest, 1939 and Self-portrait with cropped hair.* 12. **Revolución y política – Revolution and politics** *Self-portrait along the border line between Mexico and US.* 13. **Mis autorretratos – Selfpotraits** *Self-Portrait as a Tehuana, 1943.* 

4.1.1 Panel of Experts Qualitative Findings (Phase 1)

This section summarises the panel of experts' feedback received online via voice recording on Google Meet. I started the session by introducing myself, and the project supervisors and presenting an outline of the study. Then, the panellist voiced what brought them to the study and indicative topics were screen-shared to ignite discussion. Data collected in this study used pseudonyms to protect panellists' identities.

Panellists were asked how historical characters would be introduced in their cultural teachings. Sofia, for instance, preferred movies and documentaries as students "identify

easy words", and physical expressions and have a feel for different communities. Marcos hopes to see historical characters talking about food, music, and traditions such as dance and other rituals as those are "my favourite topics as a student". In terms of using technology for that purpose, Antonia pointed out that most educators are not aware of the variety of digital tools to teach language and/or cultural aspects. However, opinions on useful characteristics of a virtual learning environment varied as Sofia, the primary school teacher, used hard-copy resources, mainly worksheets and in the case of tertiary educators, Santiago stated that the use of the internet is integral for them.

When it came to accessing various websites for learning, Teresa, a student panellist, said that she finds it helpful for independent vocabulary learning and Sergio said that allowing students to jump off at any time to do a Google search about a particular topic creates agency and promotes ownership of learning. In his own words, "knowing how everything is connected is very important ... The fact that the platform allows students to collect and drop information from other sites is a bonus."

In terms of engaging students to communicate with others digitally, distinct levels of difficulties in tasks were suggested to promote collaboration. Santiago stated that voice, video, screen-sharing and streaming features were important tools to promote communication and social connections. Locations from Google Maps were suggested by Sofia to simulate dropping into a restaurant or street food scene in Mexico City. Furthermore, Santiago proposed that sensory elements could be incorporated around music and touch around 3D objects.

4.1.2 Discussion of Qualitative Findings (Phase 1)

To analyse the data collected during the online discussions, a theme codebook method was used for interpretation by reading transcriptions and responses to semi-structured questions significant themes were identified.

From the first online discussion, it was evident that teachers and students utilise a variety of resources to teach and learn about cultural aspects and influential Spanish-speaking people. However, it appeared that preference was given to movies for their ability to present vocabulary and a somewhat authentic feel for the culture in practical ways. Most

importantly, the data showed that connecting with the person being studied and understanding that their influential status is profoundly more than a fashion accessory is critical. Similarly, conversations around food and music are believed to facilitate engagement and connections and those should be part of the platform as well as the ability to visualise genuine places where expressions of arts occur. These data suggest that intelligibility and accessibility are important.

In terms of digital learning, I realised that younger generations have unlimited ways to connect which some educators are unaware of, as per discussions with panellists. These opportunities allow imagining learning from different angles to develop skills relevant to today's world. Independence of learning is a major feature, allowing students to collect and drop information from other sites is a bonus. This valuable exchange of ideas and feedback was implemented as guiding principles into the design of the prototype, as it indicated that self-directedness provides a sense of agency and freedom connecting it to the literature on heutagogy.

Despite actively encouraging panellists to engage with and adapt documents in Google Drive folders during Phase 1, only one provided suggestions to the script. This could have been caused by the various stages and live documents to manage and the panellists' full-time commitments, which is a limitation of this study. Nonetheless, I hope this practice-based research provided them with rewarding professional development opportunities and new knowledge on diverse topics as indicated in DBR contexts.

4.2 Phase 2 – Prototyping a Spanish VLE

Key steps taken in Phase 2 can be seen in Table 4.3.

Table 4.3

Phase 2 – Prototyping

Design Principles	✓ Activities that facilitate the recognition of ICC ✓ Locate learning in an authentic immersive platform to interact in Spanish. ✓ Design activities that allow time and space to engage, participate, reflect and produce ideas on a variety of everyday situations. ✓ Students learn to self-direct learning and work collaboratively in different spaces. ✓ Free-of-charge, user-friendly technology.
Script and Filming Sessions	✓ Filming schedule. ✓ Costumes selection and make-up testing. ✓ The shooting of videos. ✓ Editing and compressing videos. ✓ Uploading videos to the digital platform.
Developing Digital Platform and Website	✓ The digital spaces were organised and embedded on the Google site. ✓ The 360° spherical spaces are accessed free of charge via desktop browsers or by downloading the Spatial app.

During Phase 2, recurring design principles from Phase 1 were repetitively refined facilitating early considerations and directing the development of pedagogical activities. In Phase 2, I continued devising scenes for the script following Frida's life sequentially. Some of Frida's famous quotes were added, tasks around lyrics from popular Latin songs created and proverbs, idioms and well-known sayings from Spanish-speaking countries incorporated, as the aim was to produce a prototype to learn Spanish and be exposed to cultural aspects of the language. The script was developed through a devising process in which panellists were

invited to collaborate, however, only Antonia engaged with the writing and put ideas forward. Each scene concludes with one to three tasks to expand and reinforce prior knowledge and for students to decide what they want to focus on (Appendix 10). Users are encouraged to drop content in the form of gifs, pictures, videos, or external links and engage in communication using the live chat.

Once the script and students' assignments were finalised and translated, the actress and I produced a filming schedule and selected traditional outfits, accessories, and make-up characteristics of Frida. The COVID-19 pandemic impacted the filming schedule due to the actress' limited availability. In the end, we shot 13 scenes in three sessions of about three hours each. A restaurant and a library in Auckland city were booked as locations, but then it was evident that background noise was a major issue as resources were limited. As the actress is an L1 speaker, who lived most of her life in Mexico, her improvisations and additions enriched the videos. For example, she added names of traditional dishes, facts about piñatas and ideas for the *gender identity* and *revolution and politics* scenes. As mentioned previously, she was also encouraged to incorporate physical cues and signs for students and teachers to analyse and prompt conversation post tasks. Scenes were shot at my home and props such as Spanish books, ornaments and background objects were used to ignite students' curiosity and independent cultural exploration.

All videos were shot, stored, and edited using my Oppo Find X2 Android smartphone. I used YouCut, an editing app, to trim and crop visuals, add text and improve sound with speed and volume features. I utilised the Video Compressor app to compress and minimise footage. As explained earlier, after an extended trialling process, Spatial was chosen as it permits user collaboration and creative ways to generate, share and exhibit content in the metaverse. However, advanced hosting control tools such as adding content in others' spaces are for paid subscribers only. Moreover, Figures 4.4 and 4.5 below illustrate how full-body avatars enhance the sense of presence, and services such as Google Drive, Microsoft or Sketchfab are integrated for users to share, upload, and produce media.

Thereafter, I adapted 13 virtual auditoriums and four immersive galleries in Spatial to showcase the videos (see Table 4.2). All auditoriums contain a video of Frida welcoming and

telling users about a specific part of her life which refers to a painting in the auditorium. After experimenting with the platform, all auditoriums ended up including free-downloaded interactive 3D objects from Sketchfab[7], external hyperlinks from Google services such as Maps, Arts and Culture, and Docs as well as Fridakahlo.org[8] for self-directed learning. Visitors in these spaces can visualise floating content and what is possible as soon as they are teleported between auditoriums.

Figure 4.4

Immersive Gallery and Avatar

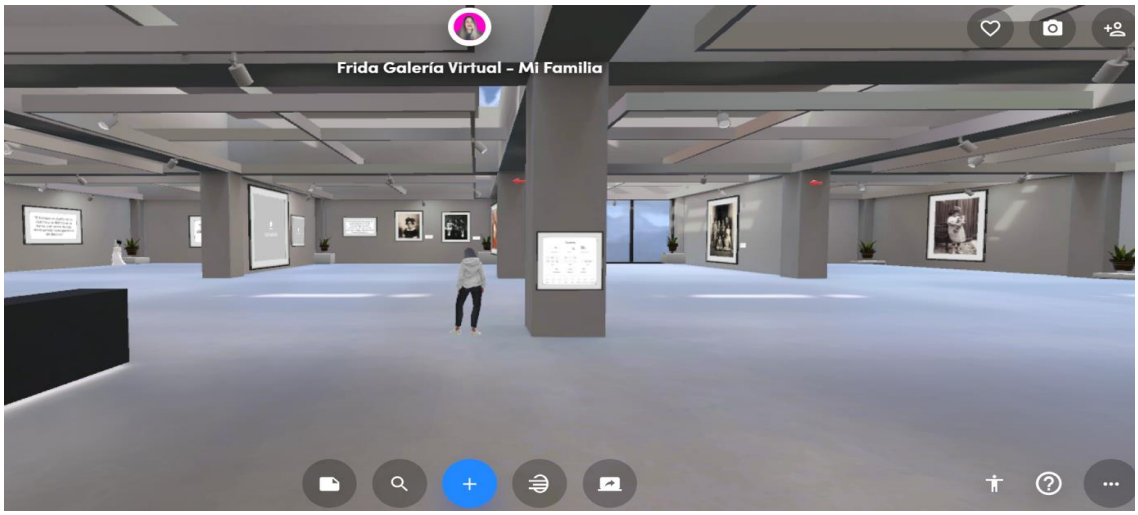
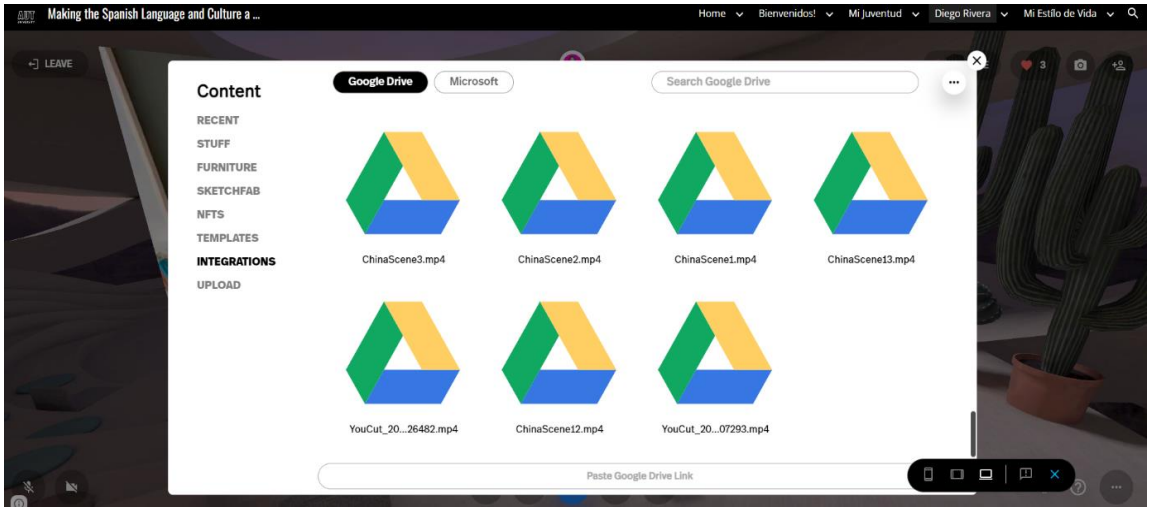


Figure 4.5

Spatial Integrations



[7] https://sketchfab.com/
[8] https://www.fridakahlo.org/

Figure 4.6 shows the auditoriums and reference paintings connecting each scene; the floating spheres are portals or external sources. Furthermore, the digital art galleries contain materials such as pictures of Frida from various stages; paintings, drawings, and letters written by her; references to important dates; short snips of information about artefacts; and external resources from Fridakahlo.org for self-directed learning purposes.

Subsequently, I created a Google Site to embed and host all the immersive spaces. I linked the auditoriums and galleries to the website, arranged pages and subpages in chronological order and wrote a blurb on the home page to tell users about the project.
Figure 4.7 shows the Google Site's appearance, and Figure 4.8 displays my design thinking process in Miro. All apps and websites utilised during the prototype development were free-of-charge and user-friendly – two of the guiding design principles.

Figure 4.6

Spatial Auditoriums, Reference Paintings and Floating Spheres

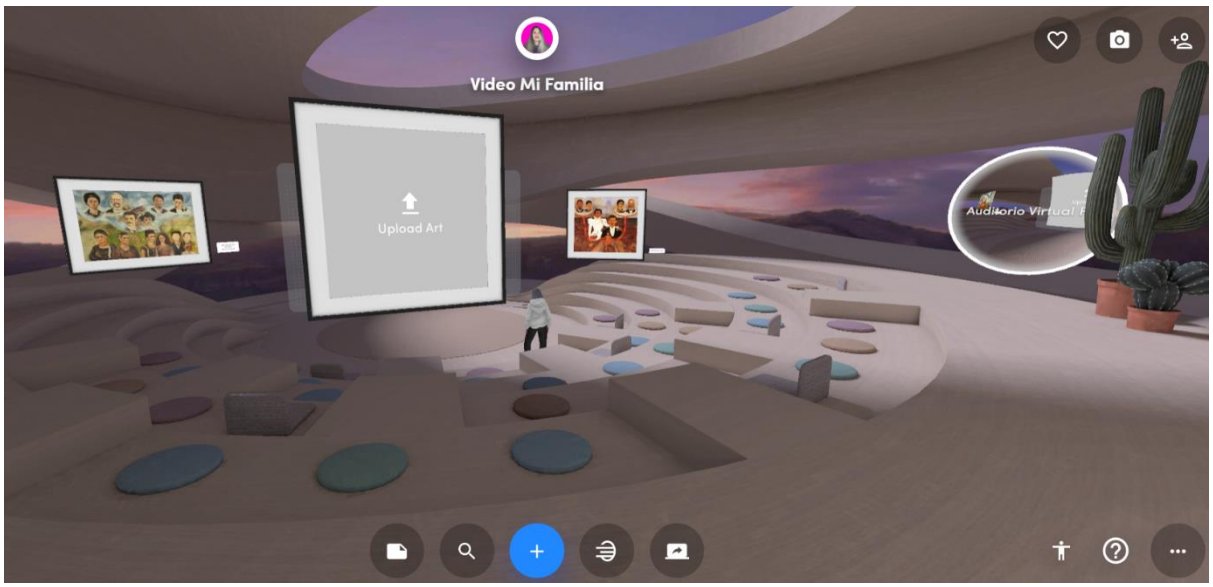


Figure 4.7

Google Site Home Page and Subpages

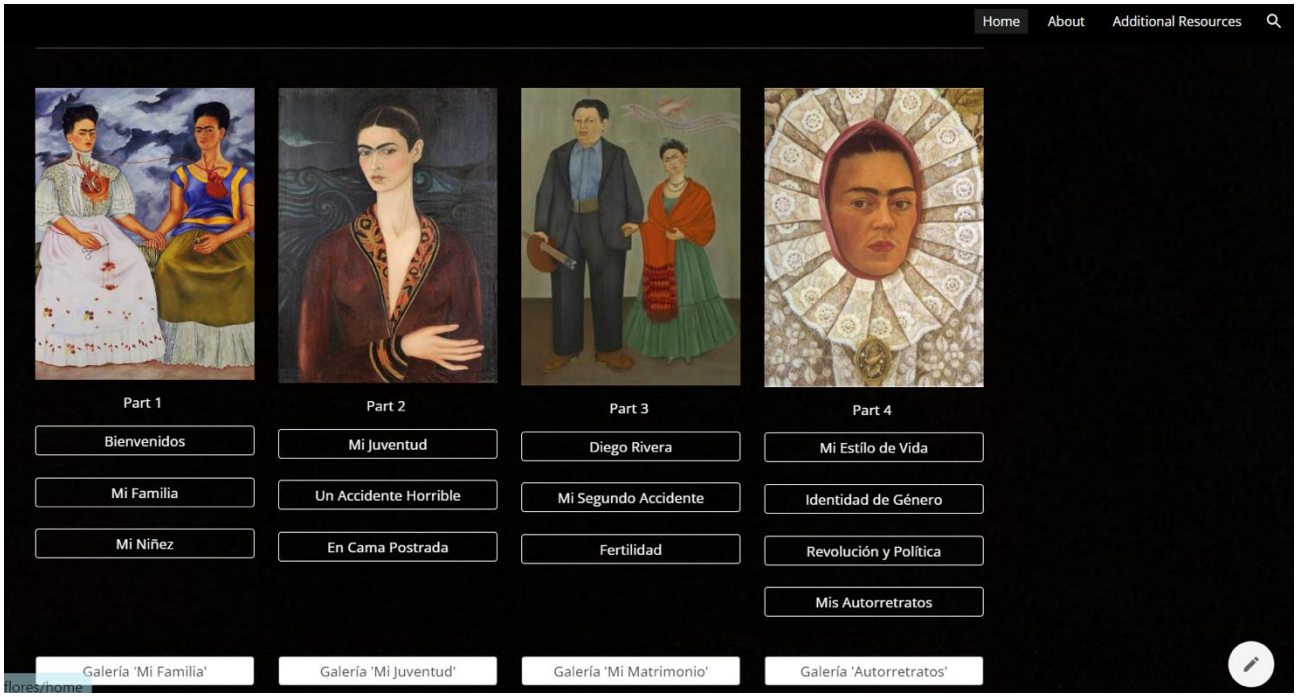
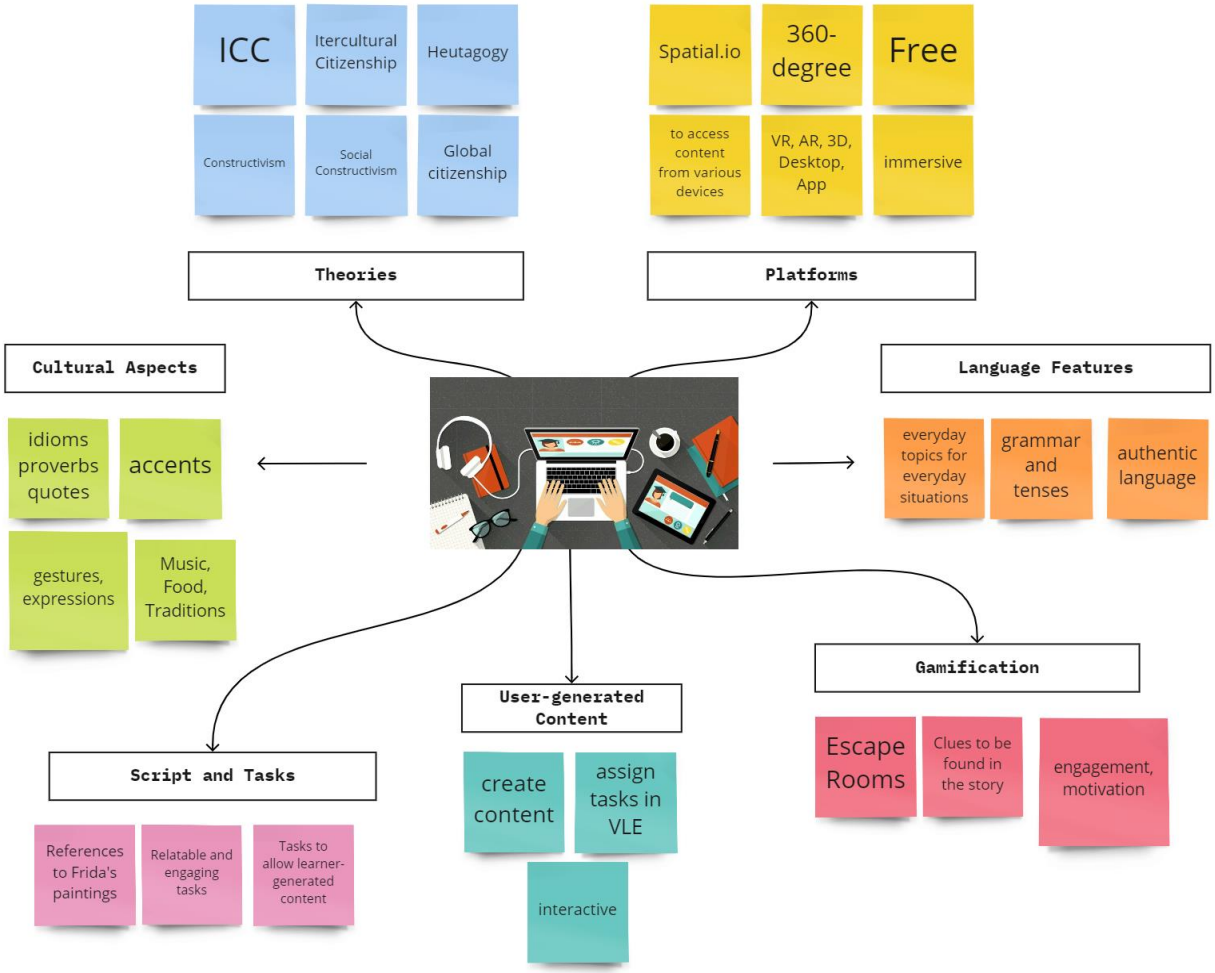


Figure 4.8

Design-Thinking Process



4.3 Phase 3 – Evaluation and Testing of Prototype Solutions

Key steps taken in Phase 3 are shown in Table 4.4.

Table 4.4

Phase 3 – Testing

The Panel of Experts' Evaluation	✓ The researcher emailed panellists with information and instructions to access the prototype. ✓ Panellists tested the VLE and completed the usability and content questionnaire to further improve the prototype. ✓ Online meeting to discuss findings
Data Collection	✓ Google Form created. ✓ The feedback from a mixed-methods approach was integrated, transcribed and organised. ✓ Suggestions to further improve the prototype were discussed and considered with the panellists in the last online meeting.
Developing Design Principles	✓ Design principles refined.

During Phase 3, I emailed the panel of experts with information and instructions to access the prototype's unpublished website. I encouraged panellists to take time to explore and navigate all auditoriums and galleries on the Google Site to provide an honest evaluation and opinion about the platform as end-users. I also asked them to watch the videos in chronological order to address concerns, test content authentically, and provide appropriate feedback on usability, language and cultural aspects. I gave them three weeks to test the VLE prototype and to complete the usability and content form, developed and revised during this phase. After various attempts to motivate the panel to proactively take part, the

panellists provided observations and ways to further improve the prototype via a mixed-methods approach using qualitative semi-structured questions and a 5-point Likert scale quantitative questionnaire. Pseudonyms were used to protect panellists' identities.

In Phase 3, I transcribed, organised and examined the data and implemented the feedback. Subsequently, emerging themes from data analysis provided an overview of how some elements of the VLE could impact the learning process, which allowed design principles to continue to emerge and be refined as per suggestions from the literature.

The following figures present the unique features of the prototype. Figure 4.9 shows the Auditorium embedded into the Google Site from Spatial. The floating spheres are portals to other auditoriums or websites, and there is a 3D emoji in the middle of the image. Figure 4.10 illustrates the Mi Juventud Gallery where floating sticky (paid-feature) notes and live chat (free-of-charge) are used to add content or interact.

Figure 4.9

Auditorium Embedded from Spatial onto Google Site

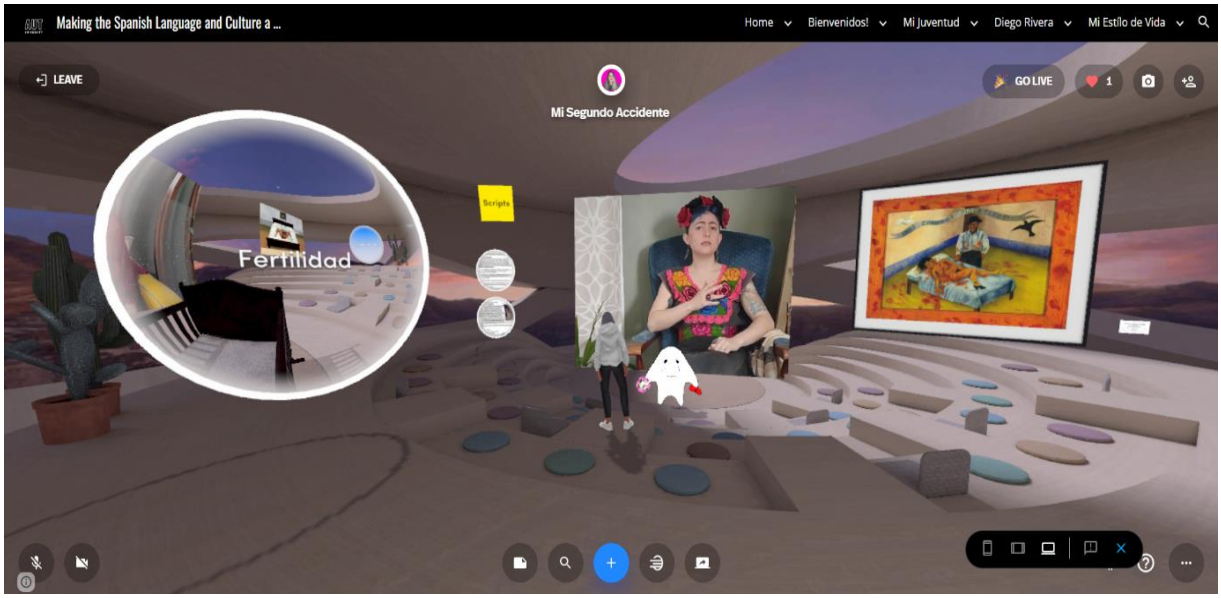
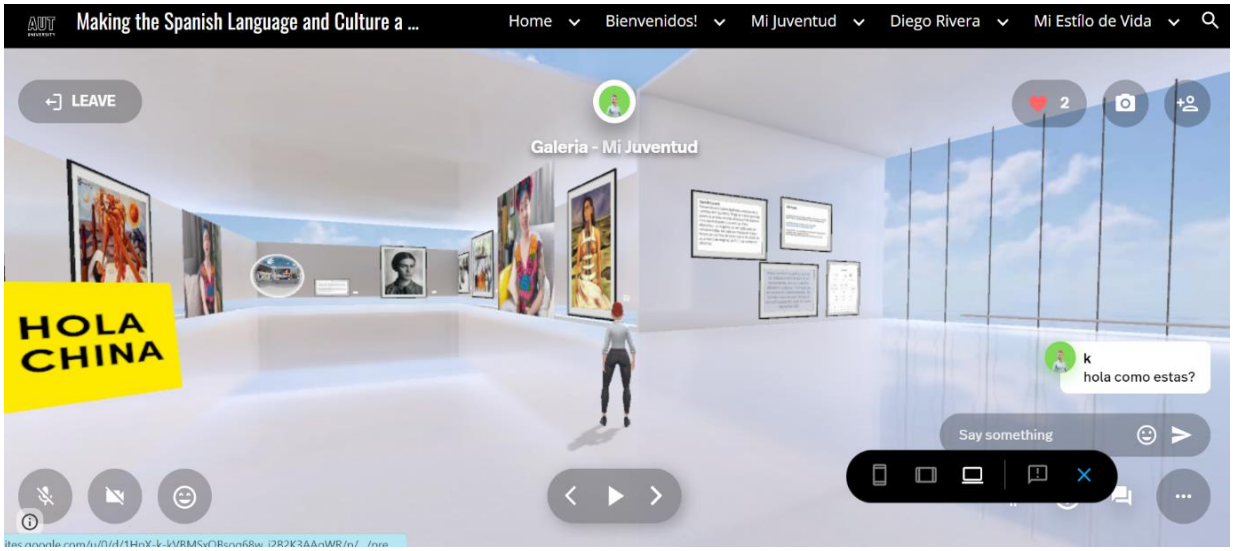


Figure 4.10

Mi Juventud Gallery



4.3.1 Language and Culture Questions

The feedback received from the panel of experts' quantitative findings in Phase 3 came via the content and usability questionnaire which used a 5-point Likert scale. Users' attitudes towards the VLE for Spanish learning are compared below.

Table 4.5 shows questions related to teaching language and cultural aspects, accessing prior knowledge, and providing consistency in the VLE. The table illustrates how many people chose each option and the percentages overall.

In this section of the questionnaire, panellists could write a concise explanation after Question 3 to answer what would make the level of language more manageable. For instance, Santiago stated that including English subtitles and/or options to reveal English text to accompany Spanish text and audio could be beneficial. Additionally, Sergio suggested that scaffolding the content into smaller chunks that were increasingly more challenging could be a good strategy when learning complex and sophisticated content. Teresa expressed that the small creative tasks were appreciated to consolidate the new content and that the acting made it easy to guess the meaning of more advanced phrases or idioms. Lastly, Antonia said that "it depends on the level of the students rather than the age group".

Table 4.5

Language and Culture Questions

Question	5-Point Likert Scale	Percentage
1. Is the content in the platform relevant to the Spanish language and culture?	6/7 Strongly agreed 1/7 Neutral	85.7% 14.3%
2. Are cultural aspects in the platform applicable to real life situations?	3/7 Strongly agreed 2/7 Agreed 2/7 Neutral	42.9% 28.6% 28.6%
3. Is the level of language in the platform challenging for students of 15-19 years of age?	1/7 Strongly agreed 3/7 Agreed 3/7 Neutral	14.3% 42.9% 42.9%
4. Do you think you were able to link this information with your previous knowledge of the Spanish language or culture?	3/7 Strongly agreed 4/7 Agreed	42.9% 57.1%
5. I feel that this platform helped me develop general cultural understanding of the Latin American community	3/7 Strongly agreed 2/7 Agreed 1/7 Neutral 1/7 Disagreed	42.9% 28.6% 14.3% 14.3%
6. I felt fully involved while navigating the platform	3/7 Strongly agreed 2/7 Agreed 2/7 Neutral	42.9% 28.6% 28.6%
7. It was easy to concentrate on the videos	2/7 Strongly agreed 3/7 Agreed 2/7 Neutral	28.6% 42.9% 28.6%
8. The information provided through the different virtual environments was consistent	2/7 Strongly agreed 3/7 Agreed 2/7 Neutral	28.6% 42.9% 28.6%
9. Overall, I think this platform could be a good learning tool	6/7 Strongly agreed 1/7 Agreed	85.7% 14.3%

The neutral answers were mostly in relation to consistency and engagement, which were aspects to improve – nevertheless the results from this section are quite positive. One panellist disagreed about the platform's ability to help develop a general cultural understanding of the Latin American communities, perhaps because this platform is about only one Mexican artist. Nonetheless, multiple references to Latino influencers are made throughout the scenes, tasks and via 3D objects. In terms of involvement and concentration while navigating the platform, panellists had to pay attention to a variety of aspects, and it was quite a novel space for many. This might have been the reason for the neutral answers in this section.

4.3.2 Independent and Collaborative Learning Questions

Table 4.6 illustrates four questions related to independent and collaborative learning. In this section of the form, panellists seem to have optimistic observations about the platform's potential to reinforce knowledge beyond the classroom via self-directed learning. This might mean that the extra references guided and motivated the panellists to explore other sites to continue learning beyond that session.

Table 4.6

Independent and Collaborative Learning

Question	5-Point Likert Scale	Percentage
10. Do you think you can apply what you have learned or seen here to other situations?	3/7 Strongly agreed 3/7 Agreed 1/7 Neutral	42.9% 42.9% 14.3%
11. Do you think you were actively engaged?	2/7 Strongly agreed 3/7 Agreed 2/7 Neutral	28.6% 42.9% 28.6%
12. Do you think there are opportunities for self-directed learning?	2/7 Strongly agreed 5/7 Agreed	28.6% 71.4%
13. Can this platform encourage independent learning?	3/7 Strongly agreed 4/7 Agreed	42.9% 57.1%

4.3.3 Usability Questions

Table 4.7 displays the answers to nine questions related to platform usability.

Table 4.7

Usability

Question	5-Point Likert Scale	Percentage
14. Is the platform easy to navigate?	2/7 Strongly agreed 3/7 Agreed 2/7 Neutral	28.6% 42.9% 28.6%
15. I was able to navigate the environments without major technical issues	1/7 Strongly agreed 3/7 Agreed 3/7 Neutral	14.3% 42.9% 42.9%
16. Is the prototype immersive? Did you feel you were present in the galleries or auditoriums?	2/7 Strongly agreed 3/7 Agreed 1/7 Neutral 1/7 Disagreed	28.6% 42.9% 14.3% 14.3%
17. We are aware of some sound issues; however, do you think the quality of the sound/picture is to a good standard overall?	3/7 Strongly agreed 2/7 Agreed 2/7 Neutral	42.9% 28.6% 28.6%
18. I can easily rotate the 360-degree screen	2/7 Strongly agreed 2/7 Agreed 1/7 Neutral 2/7 Disagreed	28.6% 28.6% 14.3% 28.6%
19. I can easily observe objects from various perspectives	1/7 Strongly agreed 4/7 Agreed 2/7 Neutral	14.3% 57.1% 28.6%
20. It is easy to interact with other websites while using this platform	2/7 Strongly agreed 3/7 Agreed 1/7 Neutral 1/7 Disagreed	28.6% 42.9% 14.3% 14.3%
21. The platform creates a sense of presence, which helps me learn vocabulary effectively	1/7 Strongly agreed 3/7 Agreed 3/7 Neutral	14.3% 57.1% 28.6%
22. I adjusted to the virtual environment experience quickly	5/7 Strongly agreed 2/7 Agreed	71% 28.6%

The table demonstrates that users found it easy to navigate. However, they perceived technical issues related to digital literacy – for instance, moving around the 360° spherical platform might have affected their feeling of presence. Nonetheless, they adjusted to the experience quickly in the end. Accordingly, participants' familiarity with the space and the platform's affordances are key factors to improve learning and user experience.

Not including open-text responses as an option in each of the quantitative questions might have limited participants' explanations; an optional free-writing slot could have contextualised their responses, particularly the neutral and disagreeing ones.

4.3.4 Discussion of Quantitative Findings (Phase 3)

The results from the first section of the questionnaire were beneficial. Data suggested that general cultural knowledge of Latin American communities needs to be further expanded, referenced, and connected to a diversity of Spanish-speaking countries. This is because one of the panellists raised a valid point that the platform, in its current state, does not represent Latin American communities, given the limited examples provided. However, it is important to reiterate that this is a prototype, and future intentions will include a broader range of Latin American content. Although the prototype VLE did not promote Latin American ICC overall, it does successfully show a part of it – Mexican culture. Future research and classroom resource development will incorporate several influential and historical characters from Hispanic backgrounds.

Moreover, the results indicate a clear relation between user engagement and tool familiarity; these aspects might need to be more consistent to enhance learning. Users perceived technical issues related to navigation keys, mobility, bad internet quality, and low computer specs, which affected the feeling of presence and immersion. Results showed that many of the panellists had not used the metaverse at all; nor had they used online gaming and AR for learning, and that might have impacted their engagement as users. Although I sent detailed information regarding signing up, avatar creation, and settings to better understand the unpublished Google Site, feedback indicates that procedures for prototype evaluations need to improve to provide users with a better service and experience in the future.

Lastly, I perceived that several answers agreed regarding the platform's capacity to reinforce prior knowledge and self-directed learning as potential benefits. This data is promising as it appears to be in line with the literature reviewed for this research. Based on this, more needs to be done in the future to fully immerse and engage users through means of high-quality audio-visuals, digital design, easy teleportation, instructions, and the use of VR headsets and similar immersive tools to complement the experience.

4.3.5 Panel of Experts' Qualitative Findings (Phase 3)

The following are summaries of the panellists' responses to the semi-structured questions in the last section of the usability and content questionnaire. Panellists answered 19 questions about a variety of topics and their overall experience (Appendix 7).

In relation to transferring content to teaching or learning contexts, Santiago sees the potential to connect content across subjects, for example using immersive galleries and interactive elements to teach art and design history, or visual culture knowledge within design education. Sofia mentioned art and feminism, and Javier saw self-directness as a transferable skill. Antonia expressed that she could use some of the activities for intercultural communicative interactions in the classroom. Teresa sees the potential to better understand facial expressions in real situations. She stated that facial expressions attached to certain phrases helped her understand how to better express oneself in Spanish: "The range of emotions presented in the dialogue made unknown vocabulary/phrases easier to pick up … using a real-life actress, rather than a virtual avatar, was a great idea."

Concerning vocabulary learning, Teresa stated that unknown words being linked to expressions of emotions, gestures, and body language facilitated memorisation. Sergio added that interactivity and participation, day-to-day phrases, and listening to a native speaker are useful features to learn vocabulary. Sofia and Antonia suggested that subtitles and captions would benefit the videos. Javier said the platform facilitates the construction of new learning which can be connected to future oral and written productions. As to learning new content and being satisfied with it, Santiago learnt more about Frida Kahlo's life, art and struggles, as well as new Spanish vocabulary and grammatical structures in this context. Javier observed that although he knew who Frida was, he was unaware of the

details about her life that appear in her work: *"I have learned a lot. I knew who Frida was, but I did not know all the details that appear throughout her work".*

In terms of opportunities for interactions with others or other platforms, Antonia saw potential to engage in real-time to practise written and/or spoken Spanish via chat, sticky notes or voice, complementing the learning experience. Sergio added that "the ability to visit other platforms from within provides important opportunities for the creation of an ecosystem of learning platforms".

Regarding preferred features to engage users, panellists in general were incredibly pleased with the actress's performance and scenes' development. Santiago enjoyed the embedded content into 3D, immersive spaces, moving as an avatar as in a videogame, and the self-directed capabilities with the external links. Furthermore, Marcos and Sofia expressed that the videos, paintings and artwork around the platform engaged them. Javier preferred the videos, the tasks, and the explanations of cultural aspects in the script. Similarly, Antonia and Sergio liked the immersion, 3D objects, avatar world, space set-up and using navigation as if in a video game. Antonia also mentioned that external hyperlinks to songs helped her learn more. Lastly, Teresa enjoyed the chronological order of portals and the addition of other important societal issues (e.g., abortion rights), which, based on the literature review and these findings, are important to create an impact beyond the classroom.

Santiago said:

> It was an engaging space to be in for language learning and a new space for me because I have not used the metaverse ... the multimedia aspects were powerful. The ability to walk around and engage with different experiences was quite a unique process, rather than flicking through a textbook or a website, the spatial element, and the way it was decorated, the voice and acting of Frida Kahlo's character were great and engaging.

Concerning using the platform successfully or unsuccessfully, panellists noted that it was a fun, novel, stimulating, appealing and engaging way to learn about Frida Kahlo's life, making the platform attractive and efficient. Antonia, Sergio and Sofia thought it was useful to combine different ways to engage with language learning, content accessibility, and self-

directedness in diverse environments. A strong point for Javier was the ease of access to external content, improving autonomous learning skills.

Although it was a new experience for many and slightly unfamiliar at the beginning, the panellists expressed that they enjoyed the experience overall. Santiago said that spending time engaging and interacting allowed the VLE to become more intuitive and easier to use. Sergio mentioned being impressed by how easy it was to be transported to other portals, galleries, and outside sources, and was “amazed by the potential to improve learning practice using immersive environments”. Panellists described their experience as stimulating, interesting, fun, immersive, novel, engaging, memorable, fascinating, different and challenging.

For an improved experience, Teresa would like to see basic information and analysis of colours and painting techniques from contemporary Mexico. This is an interesting point to consider for further iterations; it could be achieved by adding hyperlinks as portals to related websites to create an ecosystem of learning resources. Santiago commented that a variety of interactive elements to avoid repeating layouts and activity responses would enhance the experience, suggesting that changing the auditorium’s background to visually represent authentic locations in Spanish-speaking countries could be an option. Sergio stated that a clearer navigation outline and user interface in the Google Site, creating higher-quality videos, and keeping virtual spaces light for optimum internet connectivity would increase user satisfaction. Sofia said that a glossary of terms and video subtitles could improve her experience. Overall, panellists were optimistic and saw enormous potential in the prototype.

4.3.6 Discussion of Qualitative Findings (Phase 3)

The answers and suggestions from the semi-structured, open-ended questions were beneficial to further improve the prototype. As indicated by the panellists, better screen production is required for this type of project, however recruiting a professional actress was extremely beneficial regarding accent authenticity, genuine facial reactions, and characterisation. Based on their feedback, real people are still more captivating and engaging than digital characters and users appreciate that human connection.

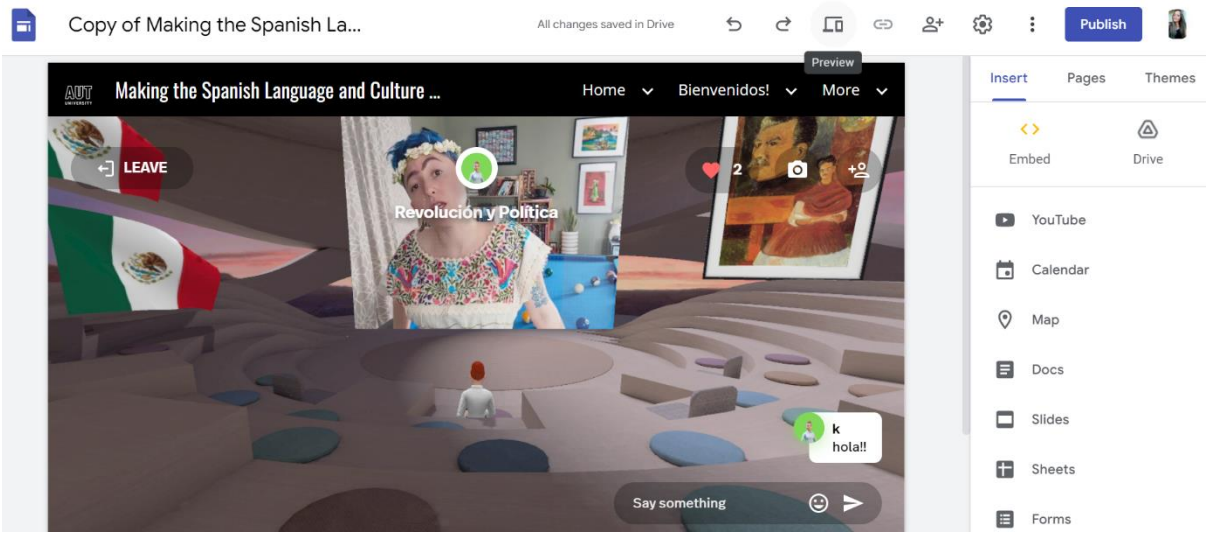
Furthermore, I noticed similarities in the data gathered from the quantitative and qualitative responses, for example extending general information about Latin America and improving live-caption or subtitles to video content boosting audio-visuals and user engagement. However, panellists maintained in both segments of the questionnaire that engaging with ICC in language learning and self-directed opportunities to reinforce information processing are clear potential benefits of this VLE, connecting key theoretical concepts mentioned previously and informing this study.

Recommendations pointed to the development of VLE ecosystems for the learning of the Spanish language and culture. The production of classroom resources cooperatively with other educators is vital and needs to be augmented. Additionally, it seems that social interactions about explicit societal issues are essential to meet communities' specific needs in knowledge acquisition. This has the potential to increase students' familiarity with content and engagement with resources, eventually facilitating learning. This study suggests that ecosystems of virtual resources for language learning developed by educators following the DBR method would also provide professional learning opportunities, networking, and sharable tools, which represents a direction for future researchers.

Panellists tested an unpublished website as it had to be formally assessed for it to be publicly accessed, which had the potential of decreasing the authenticity of the experience. Accordingly, the back end of the Google Site and its preview feature were used for a reliable feel (Figure 4.11). Panellists took longer to join and get started and this unfamiliarity caused impatience. Spatial redirects new users to their portal to first sign in with an email account and then create an avatar and/or customise it. This is followed by another window offering a quick tutorial about navigation keys and ways to react to content, which could have added to the panellists' frustration (see Figures 4.12–4.14).

Figure 4.11

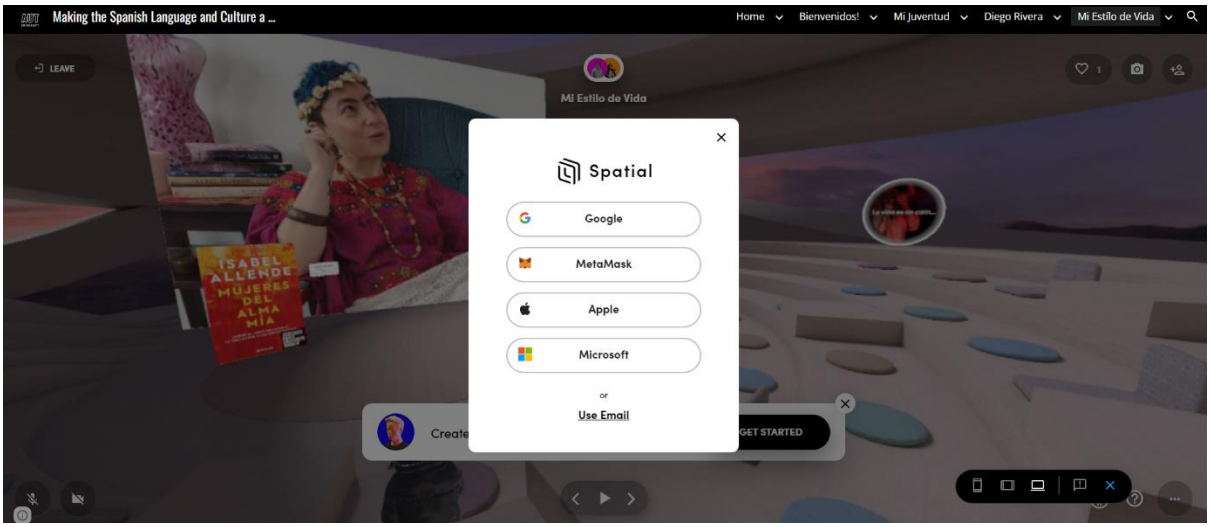
Google Site Back-end Interface



Note. Live chat appears at the bottom right corner.

Figure 4.12

Spatial Redirecting New Users



Furthermore, most of the panellists had never used the metaverse before the evaluation and were unaware of its features. The foreignness of the space made some panellists uncomfortable. Based on this feedback, the experience could potentially be improved if individuals are more familiar with the tools.

Figure 4.13

Spatial Navigation Tutorial

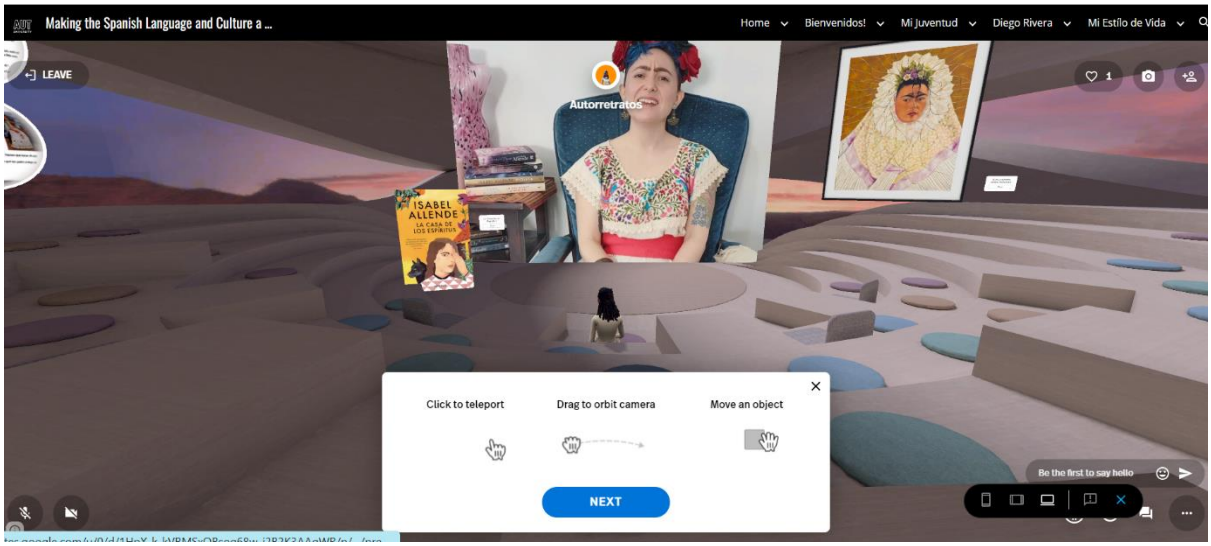
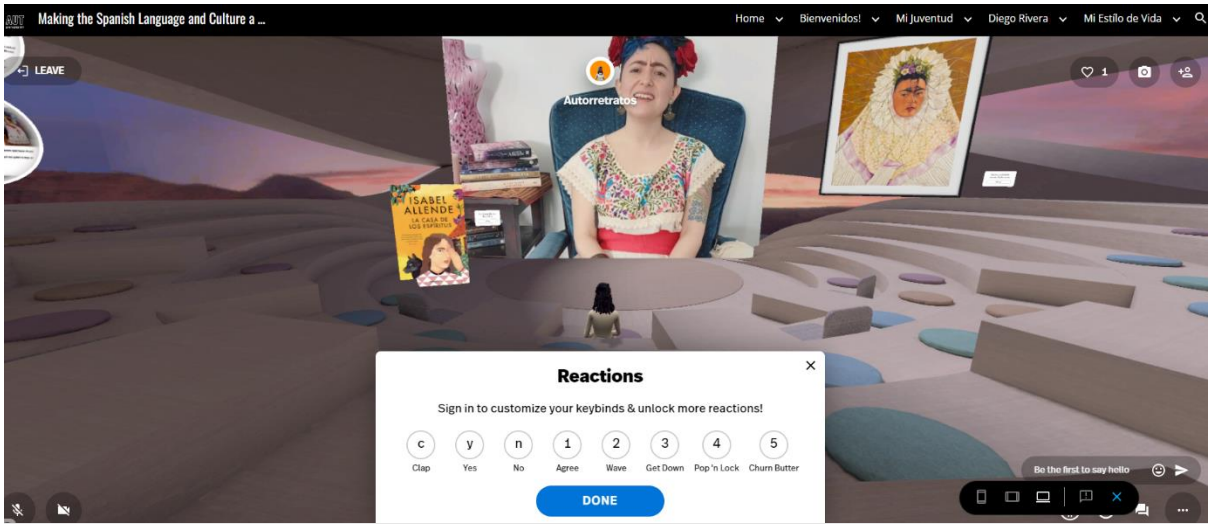


Figure 4.14

Spatial Reactions and Live Chat



Note. Reactions are ways to express oneself (e.g., dancing, clapping, waving, etc.).

4.4 Phase 4 – Maturing intervention and Design Principles Development

Table 4.8 shows the key steps undertaken in this phase.

Table 4.8

Phase 4 – Theoretical Design Principles

Data Analysis and Implementation of Solutions	Data was collected, analysed, examined and evaluated using a theme codebook method. Suggestions for improvements implemented.
Design Principles and Digital Resource Framework	Design Principles were finalised. Framework developed.
Writing Exegesis	Chapters Four and Five were completed, supervised and proofread.

In Phase 4, data analysis and implementation of solutions occurred based on the panellists' feedback. Information gathered from the questionnaire was analysed and interpretations recorded. Suggestions were implemented – for instance, subtitles were added to videos, though only a couple were modified due to the limitations of being a prototype; a few 3D objects were removed to avoid slowing the site down; and Google Map links were added to some auditoriums. Based on the literature review and qualitative and quantitative data, early design principles were refined and new ones emerged, and simple principle descriptors were added through iterations.

4.4.1 Design Principles

Table 4.9 illustrates the design principles that emerged from this practice-based research. These principles were compiled based on a review of contextual knowledge and practice which relate to the constructivist theory applied to the concept of ICC in digital platforms. The data gathered from panellists in Phases 1 and 3 and the iteration and implementation of feedback confirmed that the design principles were met in the platform.

Table 4.9

Design Principles

Design Principles	
1. A VLE that promotes ICC while learning Spanish.	Virtual classroom resource to learn the Spanish language and culture and communicative skills.
2. Locate learning in an authentic immersive digital platform to interact in Spanish.	To interact in Spanish about everyday topics and enhance digital skills.
3. Design tasks that allow time and space to engage, participate, reflect and produce ideas on a variety of everyday situations.	Pedagogical resources to engage and motivate learning supported by constructive instruction.
4. Human Connections.	Human connection via social interactions is essential to learning.
5. Students learn to self-direct learning and work collaboratively in different spaces.	Heutagogy is based on constructivism as a guiding pedagogical framework.
6. To embed and allow access to outside sources.	To allow independence of learning.
7. Utilise design-based research as the methodology.	Experts from different fields discuss, understand and create solutions to issues to improve principles and results continuously in the process.
8. Develop an ecosystem of sharable tools, sources and networks.	To promote the share of resources and to create opportunities for digital literacy and training for educators.
9. Enable learning using affordances from free-to-use platforms and social media tools.	Affordances such as AR, VR, 3D or chat.
10. Utilise user-friendly, easy-to-access and user-generated platforms.	To create and share new content. Reachable from desktop browsers or by the app for tables and phones.

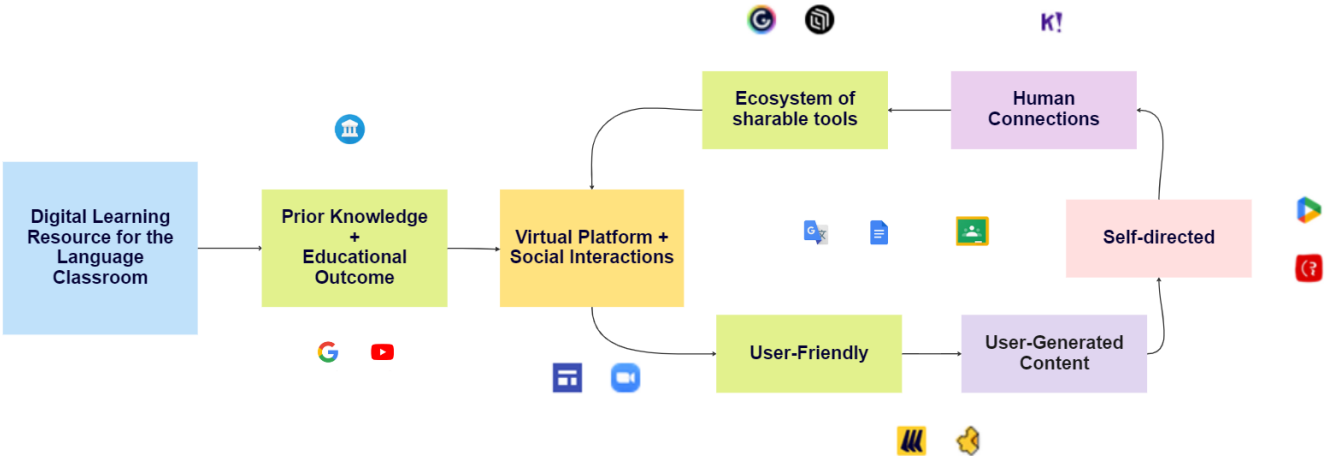
4.4.2 Proposed Framework

Figure 4.15 illustrates a simple framework developed as part of the research to guide the prototyping of digital learning resources. This framework can be regarded as a set of basic guidelines intended to be flexible and adaptable to the conditions and technologies in various places.

This framework facilitates building theoretically supported environments and proposes adding unique features for learning. Its outline indicates that to develop a digital learning tool, prior knowledge and an educational outcome must be considered for related tasks. Also, virtual environments should provide opportunities for social interactions and interconnect technological affordances.

Figure 4.15

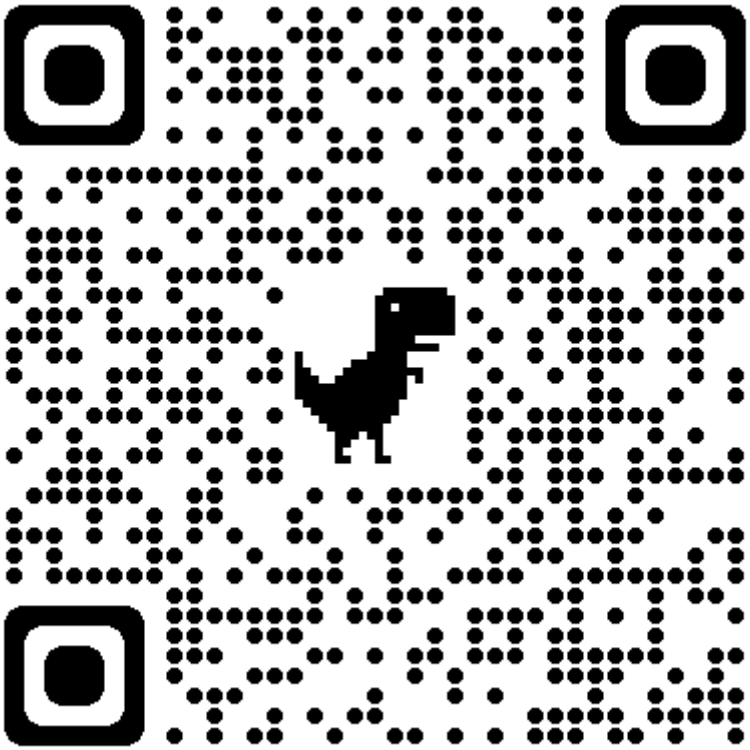
Proposed Framework



The following is the URL to the prototyped website: https://sites.google.com/view/pintocarasyflores/home, and Figure 4.16 shows the QR code for easy access.

Figure 4.16

QR Scan Code for Website



4.5 Key Points

This chapter has presented the practice, design thinking methods and critical commentary relating to this study. The method to produce a VLE prototype, experiential processes, reflections on success and failures, and final decisions via iteration were described. Based on participants' feedback, the VLE developed in this study has significant potential to facilitate Spanish language learners' intercultural communicative competence. This is based on panellists' responses and was achieved by applying the design principles compiled based on the contextual review. Chapter 5 summarises this study and its main findings, and presents reflections, limitations, and future research possibilities.

5. Overview and Reflections

This chapter provides an overview of this study, summarising the guiding theories and methodology used to prototype a VLE in the metaverse. It also presents a critical reflection on the research outcomes, limitations during prototype production, as well as implications and suggestions for practitioners. Finally, ideas for future enquiries identified in this study are identified.

5.1 Summary and Findings of the Study

Chapter 1 outlined the state of language learning in Aotearoa New Zealand, suggesting that language education's continuity requires a profound change in paradigm (Nicolaidou et al., 2021) from traditional learning towards social awareness and intercultural communication (Lyddon, 2018) in innovative learning environments and with engaging pedagogical resources (Pardo-Ballester & Rodríguez, 2013a). Chapter 2 presented a critical review of contextual and practical knowledge on interculturalism, constructivism, socio-constructivism, digital learning affordances, and self-directed concepts that can be applied in VLEs. This chapter highlighted that language connects and influences culture and identity, facilitating interactions with different people across cultural boundaries (Byram, 1997) and analysis of surroundings and behaviours (Newton et al., 2010). Accordingly, learners are the main agents in their learning, which occurs because of past experiences.

Chapter 3 introduced design-based research (DBR) as the methodology. This chapter explained DBR in detail, introduced the participants and their pseudonyms, outlined ethical considerations and aspects of validity and reliability, and described the mixed-method design for data collection adopted. DBR's four phases involve a variety of practitioners unravelling practice issues in educational materials. Chapter 4 then provided an overview of the design, development, and construction of the VLE prototype. Qualitative and quantitative data were collected and analysed, followed by a critical commentary and reflection on the practice that supported this practice-based research.

The findings in this study permitted the development of a classroom resource prototype in the metaverse for the Spanish classroom. This resource encourages language practice in

everyday situations while students learn about Frida Kahlo, an influential artist and historical figure from Mexico. The interactive spaces contain videos of an L1 speaker –a Mexican actress playing the role of Frida – to facilitate human-like connections, accompanied by supplementary tasks that can potentially facilitate students' development and recognition of intercultural skills, anywhere and at their own pace. Tasks were influenced by constructivist instructional approaches and promoted social interactions with learning sources. For instance, videos provide additional cultural elements, such as outfits, books and accessories to reflect and make connections with idioms, proverbs and Hispanic songs mentioned in the scenes, and enhance self-directed cultural explorations.

The VLE hosted in the metaverse was developed and tested by a panel of experts consisting of Spanish language teachers and students and design-technologist practitioners who previewed and experienced the prototype to provide feedback. Panellists' feedback was interpreted and applied for further modifications. As a result, a set of design principles were generated and refined iteratively, which emerged from and guided the production of the prototype for proof-of-concept. Also, a suitable framework to build VLEs was developed which categorises key elements for its implementation and was based on a literature review. Although there were challenges during this project, all panellists approved and highlighted the usefulness of the prototype. The platform's potential means that intercultural communicative elements are being explored, exposed and discussed further in learning settings.

As per the contextual knowledge and practice review, to increase effective communication students need to be able to recognise, expand and reflect on the language being learned. While the goal is to prepare them for real-world interactions, only a limited number of classroom resources provide practical examples of intercultural skills. Thus, innovative solutions were applied in this study to produce this prototype, encouraged by the lack of educators' digital and ICC knowledge and intercultural digital language resources available. Students are likely to engage more if educators are aware of new technologies. Teaching that is influenced by technological advances and their affordances can provide virtual literacy training and make learning experiences memorable. Accordingly, a deeper understanding of these tools eliminates the probable time, space and distance barriers to learning. Potential users can experiment with the Spanish language and culture, arts and

technology, improve listening skills and recognise meaning in body language, and use Spanish vocabulary to produce original content while using this prototype. In addition to refining learners' self-directed learning skills beyond the classroom, this VLE has the potential to also build foundations for intercultural respect, appreciation and celebration of diversity.

5.2 Implications for Practitioners

The virtual world prototyped in this study demonstrated its potential as an educational resource to recognise intercultural communicative opportunities and potentially facilitate ICC development. Furthermore, the easy-to-follow work scheme, lesson plan and teachers' notes (Appendix 10) developed and incorporated into the final website as shareable resources together with the prototype could be helpful to Spanish teachers.

Based on the results, processes and prototype of this study, applying the design principles with the proposed framework to produce digital classroom resources developed in this study is highly recommended. This also suggests that the production of educational platforms focused on promoting ICC, self-directedness and language learning using free-of-cost resources can be achieved. Nonetheless, having a higher budget to develop or purchase state-of-the-art digital spaces and interactive objects for classroom purposes could increase students' engagement and resource novelty. This study also found that users value the incorporation of human reactions, facial expressions and connections while learning. Additionally, the proposed framework has the potential to be utilised and transferred to build VLEs for similar subjects such as History, Arts and Design or even Sciences.

Using a panel of expert contributors from different fields benefited and enhanced the production of a solid and robust digital resource, which suggests that utilising such a group as a starting point to inform and develop digital learning in different contexts is highly valuable and recommended. Furthermore, sharing documents and constant constructive evaluations are excellent opportunities for professional development, networking and being up to date with emerging resources.

Finally, this study demonstrates the advantages of developing ecosystems of digital working spaces to produce VLEs and digital networks for language teaching and learning. In this

research, a Google Drive folder was shared containing a variety of documents as well as the prototype Google Site; panellists were then encouraged to collaborate, edit and make suggestions. Rethinking students' roles from content consumers to content creators and their agency to choose what to focus on is particularly important. Interconnected learning networks could be achieved by using technology affordances, creating opportunities to experience independent digital learning beyond the classroom at students' pace and promoting interrelations between different generations and communities; these topics are also rich areas for future research (see below).

5.3 Research Limitations

Time and funding were two fundamental limitations of this study. A project of this magnitude ideally requires a professional production and filming team or company, and digital learning programmers to make the prototype as effective as possible. The lack of resources and production budget meant that I had to project manage, produce and script-write, video record and edit, and develop and modify digital platforms myself in a short time period, which impacted the digital quality and usability of the prototype. However, the free-of-cost production of this prototype is an example of the possibilities for language teachers to create additional (digital) resources for their students, enhancing their learning within and beyond the classroom.

In this study, participants evaluated an unpublished website, possibly decreasing the authenticity of the experience. To add to that, most of them had not experienced the metaverse before. The foreignness of the space made some panellists uncomfortable. This indicates the importance of familiarity when accessing digital affordances. Additionally, the panel of experts was limited to testing only the desktop version of the platform. Online evaluations were done individually, at their preferred time, and remotely as delivering and returning the VR equipment would have been an extra task for me to commit to. This also limited the panellists' experience as they could not take advantage of all possibilities offered, which presents a limitation of the data and findings.

Moreover, not having the ability to unpack responses in the quantitative section of the questionnaire might have limited participants' feedback. Despite these constraints, the data collected, design principles, proposed framework, and end-product are valuable findings that are applicable in various fields of language acquisition, digital learning, ICC learning and meta-education.

5.4 Future Research

In future PhD research, I would like to continue exploring emerging learning platforms to find new and creative ways to design effective and engaging spaces for language learning. Likewise, this research could be extended to assess the development of ICC in students who use this VLE.

Furthermore, I am eager to discover the potential role and application of the metaverse in social learning dimensions. I am interested in focusing on meta-education to originate and test suitable frameworks, design principles and specific learning strategies linking emerging or existing educational theories to develop innovative learning environments in which language acquisition could happen. Further research could also examine the potential cognitive effects of the metaverse, learners' performances and perceptions of meta-education, and the role of body language and meaning-making in language and ICC digital learning.

I am excited to continue prototyping virtual language platforms with groups of gamers, designers and practitioners and trying different multimedia for education purposes. I would also like to explore the benefits of developing ecosystems of digital working spaces for networking and professional and learner literacy.

Artificial intelligence (AI) in language acquisition and intercultural development is another interesting topic. For instance, the effects of human-like intelligence, interactivity and experiences; and chatbots' capabilities such as linguistic and voice personalisation on language learning. Algorithms in AI understand users' context and respond accordingly – a similar question can therefore result in different responses.

5.5 Final Reflection

This project aimed to prototype a VLE as a classroom resource for the learning of the Spanish language and culture to facilitate opportunities for ICC. A full explanatory and informative description of methodologies and information about the process and the artefact has been presented in this exegesis. The findings of this study are proof that the development of free-of-cost educational platforms to promote ICC, self-directed learning, and language learning is feasible.

To conclude, creative language programmes in innovative environments would be beneficial for boosting and raising the profile of foreign languages in Aotearoa New Zealand. Educators could make more use of the diversity of digital resources already available online and develop ecosystems of sharable tools. This is because language teaching has evolved from training students to be fluent and accurate communicators to understanding implicit cultural assumptions, beliefs and practices that determine successful communication (Tolosa et al., 2018). Language learning's current goal is to prepare learners to become global citizens, cultivate communication skills, and encourage critical thinking that leads to social action (Byram, 2013). However, most educators in this research were unaware of the metaverse's features and the application of some of the apps and emerging technologies used here. Thus, by increasing educators' awareness of these technologies, greater student engagement is potentially obtained. Technological advancements and their affordances not only bring learners closer to gaining an understanding of different communities and the ways they interconnect, but also eliminate barriers to learning caused by time, space or distance, and permit the construction of foundations for intercultural respect, appreciation, celebration and acceptance of diversity, extending learners' self-directed learning skills beyond the classroom.

ICC in language acquisition encourages students to think beyond their community borders to connect with and participate in other societies and cultures (Porto, Houghton & Byram, 2018). The students examine and challenge stereotypes, confronting prejudices while communicating and exchanging ideas. They thus construct new perspectives and expand their knowledge while radical change occurs in attitudes towards the world and themselves.

Online learning is evolving from traditional multimedia to more immersive, dynamic, intuitive and engaging learning environments where native speakers become teachers of languages and critical content is relatable and develops communicative skills, promoting inclusiveness and critical reflections. Knowing how to use emerging tools means that learning can occur perpetually, alternatively, and anywhere in partnership with anyone, encouraging the sharing of knowledge from formal and informal hybrid learning experiences. Students take ownership of virtual spaces and are co-creators in the learning process.

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7. Appendices

Appendix 1 - Invitation to Participate (Email)

Project title: Learning Spanish language and culture; a virtual reality.

Project Supervisors: Dr Elba Ramirez and Dr Claudio Aguayo

Researcher: Karen Peredo

Dear [Participant Full Name],
My name is Karen Peredo, and I am a master's student in the Faculty of Culture and Society at Auckland University of Technology (AUT). To complete my master of Language and Culture degree, I am going to create an educational digital platform to learn the Spanish language and cultural aspects through a historically influential character from a Spanish-speaking country. I would like to invite you to share your expertise on additional language teaching and learning, interculturalism and the application of educational technology design to create a virtual learning environment using immersive 360-degree video footage. A design-based research methodology will be adopted in this study, which requires participants to work collaboratively and maintain continuous communication to improve prototype design. This project aims to enhance language learning and potentially boost intercultural communicative skills in authentic educational contexts.

This research will explore ways to determine to what extent can a virtual learning environment based on 360-degree video facilitate Spanish language learners' intercultural communicative competence (ICC) in the New Zealand educational context. ICC is the desire to acknowledge, appreciate and embrace cultural differences that originate from a motivation to understand one's social group. This study offers a rare opportunity for students, teachers, and practitioners to work collaboratively, critically engage and reflect on practice-based research that involves the use of educational technology and student-centred approaches to promote intercultural communicative competence in Spanish classrooms. Moreover, this study will contribute to different fields of research, for instance, those related to language teaching and learning, educational technology design, intercultural studies, and global citizenship as well as distance and self-directed learning.

Participation in this study involves being part of a Panel of Experts. The Panel of Experts will be composed of one Spanish language teacher (with knowledge of ICC theory), one educational technologist / digital designer, and two undergraduate Spanish language students. The total number of experts integrating the focus group will be 5, this includes me, the primary researcher. The Panel of Experts will be the same throughout the research stages. There are two online group meetings, one trial of a digital prototype and the

completion of a platform evaluation form predicted as part of the study. In the first meeting of approximately 45 minutes, the focus group will meet online via Microsoft Teams to analyse and discuss how intercultural communicative competence can be facilitated and promoted through language learning in digital education. These discussions will consider topics such as distance learning and student-centred approaches, digital language learning, 360-degree learning environments and digital language resources, among others. Content from these meetings will lead to a set of early design principles and solution ideas. The trial of the prototype will take approximately 15 minutes. Participants will test the proposed prototype individually to address relevant concerns and then share their experiences with the digital interface to develop design solutions and discuss usability and content. The evaluation form will take approximately 10 minutes to complete. Lastly, in the second meeting of about 45 minutes, the focus group will meet to evaluate a prototype and integrate related findings. Data will be collaboratively checked and examined with and by the focus group to further improve the outcomes of the prototype evaluation. The meetings will be recorded and transcribed. Transcriptions will be sent back to participants to confirm accuracy.

Please note that I would like to present findings from this project at suitable conferences if possibilities arise and/or share this resource/prototype with other language teachers in the future.
We will provide a $50 gift voucher to each participant.

If you are interested in participating, please read the Information Sheet attached to this email, fill out and sign the Consent Forms, and send them back to me via email. Feel free to get in contact if you have any more questions.

Kind regards,
Karen Peredo Alarcon

Researcher Contact Details: Karen Peredo karen.peredo@gmail.com
Dr Elba Ramirez elba.ramirez@aut.ac.nz Office: 09 921 9999 ext. 6125 or
Dr Claudio Aguayo claudio.aguayo@aut.ac.nz Office: 09 921 9666 ext. 5253

Approved by the Auckland University of Technology Ethics Committee on 27 June 2022
AUTEC Reference number: 22/98.

Appendix 2 - Participant Information Sheet (Experts)

Date Information Sheet Produced: 27/06/2022

Project Title

Learning Spanish language and culture; a virtual reality.

An Invitation

My name is Karen Peredo, and I am a master's student at the Faculty of Culture and Society at Auckland University of Technology (AUT). I am conducting this study as part of my master's research. As a high school language teacher, I would like to explore and design new media technologies such as 360-degree immersive videos to enhance Spanish language learners' intercultural communicative skills. I would like to invite you to participate. This information sheet will help you decide if this is of interest to you.

What is the purpose of this research?

This research is part of a master's qualification in Language and Culture at AUT. The purpose of this research is to prototype a virtual learning environment (VLE) that could potentially facilitate Spanish language learners' intercultural communicative competence (ICC) and provide opportunities for language practice. The VLE will feature interactive 360-degree videos of a first language (L1) speaker of Spanish acting as an influential historical figure. This platform will be based on a framework devised from a literature review and interpretation of results on promoting ICC in digital learning environments. This project will follow a design-based research (DBR) methodology leading to a set of practice-informed theoretical design principles shaped by a focus group to develop a virtual learning environment for Spanish learning.

How was I identified and why am I being invited to participate in this research?

You are being invited as you have responded to my advertisement, hence this Participant Information Sheet has been sent to you. You are eligible to be in this study because you are either 1) a Spanish language teacher (with knowledge of intercultural communicative competence), 2) an undergraduate Spanish language student or 3) an educational technology and digital design practitioner.
The following people who do not meet the criteria and are excluded from the study: A) Students under 21-year-old and students of Dr Elba Ramirez and Dr Claudio Aguayo; B) teachers from Albany Senior High, primary researcher's current workplace, former colleagues or friends of the primary researcher will be excluded to avoid conflict of interest; C) digital designers' student of Claudio Aguayo will be excluded to avoid conflict of interest.

How do I agree to participate in this research?

You can confirm your participation in this research via email after reading the Participant Information Sheet attached. A Consent Form will also be given to you to sign before the interview. Your participation in this research is voluntary and whether you choose to participate will neither advantage nor disadvantage you. Participants can withdraw from the study at any time.

What will happen in this research?

First Online Focus Group Meeting – 45 minutes via Microsoft Teams. The Panel of Experts will meet online to analyse and discuss how intercultural communicative skills can be facilitated and promoted through language learning in digital education. These discussions will consider topics such as distance learning and student-centred theories, digital language learning, 360-degree learning environments and digital language resources, among others. This consultation will lead to a set of early design principles and solution ideas.
Trial of Prototype – 15 minutes. The Panel of Experts test the proposed prototype individually to address relevant concerns and then share their experiences with the digital interface to develop design solutions and discuss usability and content.
Evaluation Form – 45 minutes. The Panel of Experts will share their impressions and experience with the prototype.
Second Online Focus Group Meeting – 45 minutes via Microsoft Teams. The Panel of Experts will meet to discuss the evaluation of the prototype for further feedback on its potential usability and content. The feedback from users will be integrated to facilitate deeper understanding and reduce generalisation. Data will be transcribed, organised, collaboratively checked, and examined with and by the focus group to further improve the outcomes of the prototype evaluation.

What are the discomforts and risks?

There will not be experiences of discomfort or risk during the interviews and the focus group meetings.
There are no right or wrong answers and there will not be any trick questions during interviews. I am simply interested in your genuine impressions and responses. No questions unrelated to the research will be asked. Your responses will be entirely confidential and never discussed outside my supervisor and study. Moreover, this study does not have any impact or repercussions for your current course of study.

What are the benefits?

You may find it rewarding to contribute as part of a panel of experts to a research project about your area of expertise. Your feedback and experiences will be valued by me. This project promotes networking relationships and mutual respect between researchers and focus groups. You may find the research process, including the opportunity to reflect on language learning, the cycle of collaboration, and contributing to designing and redesigning a virtual environment for language and culture learning interesting. Most importantly, both you and I will benefit from this research as active involvement accomplishes professional

development. The low-risk character of the investigation, as well as the lack of pressure, are intended to help you feel at ease and to foster a positive rapport between the researcher and other participants. This is a rare opportunity as these types of activities are not common unless you are taking courses related to interculturality. The wider community will also benefit by having access to a language resource for educational contexts. I would like to present findings from this project at suitable conferences if possibilities arise and/or share this resource/prototype with other language teachers in the future. Moreover, by participating in this study, you are helping me towards completing a Master's in Language and Culture. Participation in this study will be rewarded with a $50 gift card.

How will my privacy be protected?

The interviews will be confidential, meaning that your identity will only be known to me (the researcher). After the interviews, your responses will be recorded under a pseudonym, meaning that your real name will not be used or revealed anywhere in the study, no other identifying information about you will be revealed, and your responses and recorded interview will be stored in protected cloud storage, in AUT's I: Drive. Your Consent Forms, contact details, information from discussions and data will be kept confidential. Your responses and recorded interviews will be stored in protected cloud storage, in AUT's I: Drive. The transcriptions for this study will only be done by the primary researcher Karen Peredo and will only be accessible to the research supervisors (Dr Ramirez and Dr Aguayo). All data will be disposed of through the AUT document destruction service.

What are the costs of participating in this research?

Participation will take 2-3 hours of your time. There are no direct financial costs for participating.

What opportunity do I have to consider this invitation?

Please take two weeks to read the Information Sheet, Consent Forms Topic of Discussion, and Indicative Questions. If you have any questions, please contact me via email:

Will I receive feedback on the results of this research?

If you would like to receive a summary of the findings, please tick the designated circle, and write your contact details on the Consent Form.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in first instance to the Project Supervisors.

Whom do I contact for further information about this research?

The primary researcher can be contacted for further information.

Appendix 3 – Participant Information Sheet (Actor)

Project title: Learning Spanish language and culture; a virtual reality.
Project Supervisors: Dr Elba Ramirez and Dr Claudio Aguayo
Researcher: Karen Peredo

Project Title
Learning Spanish language and culture; a virtual reality.

An Invitation
My name is Karen Peredo, and I am a master's student at the Faculty of Culture and Society at Auckland University of Technology (AUT). I am conducting this study as part of my master's research. As a high school language teacher, I would like to explore and design new media technologies such as 360-degree immersive videos to enhance Spanish language learners' intercultural communicative skills. I would like to invite you to participate. This information sheet will help you decide if this is of interest to you.

What is the purpose of this research?
This research is part of a master's qualification in Language and Culture at AUT. The purpose of this research is to prototype a virtual learning environment (VLE) that could potentially facilitate Spanish language learners' intercultural communicative competence (ICC) and provide opportunities for language practice. The VLE will feature interactive 360-degree videos of a first language (L1) speaker of Spanish acting as an influential historical figure. This platform will be based on a framework devised from a literature review and interpretation of results on promoting ICC in digital learning environments. This project will follow a design-based research (DBR) methodology leading to a set of practice-informed theoretical design principles shaped by a focus group to develop a virtual learning environment for Spanish learning.

How was I identified and why am I being invited to participate in this research?
You are being invited as you have responded to my advertisement, hence this Participant Information Sheet has been sent to you. You are eligible to be in this study because you are either 1) Spanish speaking actor; 2) are from Mexico; 3) are happy and confident in front of a camera; 4) you are willing to be part of an interactive educational 360-degree video for learning the Spanish language.

The people who do not meet the criteria are excluded from the study: A) Actresses under 21 years old; B) Students of Elba Ramirez or Claudio Aguayo will be excluded to avoid conflict of interest; C) speakers of Spanish as an additional language.

How do I agree to participate in this research?
You can confirm your participation in this research via email after reading the Participant Information Sheet attached. A Consent Form will also be given to you to sign before filming

starts. Your participation in this research is voluntary and whether you choose to participate will neither advantage nor disadvantage you. Participants can withdraw from the study at any time.

What will happen in this research?
I only need one actor for this study and only this person will appear in the recordings. You, as the actor, will be required to for approximately 2 hours. Filming will be completed in the AUT App Lab studio on the City Campus.

What are the discomforts and risks?
There will not be experiences of discomfort or risk during the filming session.
There are no right or wrong answers and there will not be any trick questions during interviews. I am not testing or evaluating your language proficiency or acting skills. I am simply interested in your participation and genuine interpretation of Frida Kahlo. No questions unrelated to the research will be asked. Moreover, this study does not have any impact or repercussions for your current course of study at AUT.

What are the benefits?
You will be part of an exciting project that promotes the Spanish language and culture through the study of influential and historical characters from Latin America and Spanish-speaking countries.

What are the costs of participating in this research?
Participation will take approximately 2 hours of your time. There are no direct financial costs for participating.

What opportunity do I have to consider this invitation?
Please take two weeks to read the Information Sheet, Consent Forms Topic of Discussion, and Indicative Questions. If you have any questions, please contact me via email: karen.peredo@gmail.com

Will I receive feedback on the results of this research?
If you would like to receive a summary of the findings, please tick the designated circle, and write your contact details on the Consent Form.

What do I do if I have concerns about this research?
Any concerns regarding the nature of this project should be notified in first instance to the Project Supervisors.

Whom do I contact for further information about this research?
The primary researcher can be contacted for further information.
You will receive a $70 gift card as thanks for your participation!
Primary Researcher Contact Details:
Karen Peredo Alarcon karen.peredo@gmail.com 0274254937
Project Supervisors Contact Details:
Dr Elba Ramirez elba.ramirez@aut.ac.nz Office: 09 921 9999 ext. 6125 or
Dr Claudio Aguayo claudio.aguayo@aut.ac.nz Office: 09 921 9666 ext. 525

Appendix 4 - Consent Form (Experts)

Project title: Learning Spanish language and culture; a virtual reality.
Project Supervisors: Dr Elba Ramirez and Dr Claudio Aguayo
Researcher: Karen Peredo

☐	I have read and understood the information provided about this research project in the Information Sheet dated _/_/2022
☐	I have had an opportunity to ask questions and to have them answered.
☐	I understand that the identity of my fellow participants and our discussions in the focus group is confidential to the group, and I agree to keep this information confidential.
☐	I understand that notes will be taken during the focus group and that they will also be audio-recorded and transcribed.
☐	I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
☐	I understand that if I withdraw from the study then, while it may not be possible to destroy all records of the focus group discussion of which I was part, I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used while retaining confidentiality. However, once the findings have been produced, the removal of my data may not be possible.
☐	I agree to take part in this research.
☐	If a one-to-one interview is deemed necessary, I am willing to participate in this additional activity: Yes☐ No☐
☐	I wish to receive a summary of the research findings (please tick one): Yes☐ No☐

Participant's name:
……

Participant's signature:
……

Email: …… Phone: ……

Date……

Appendix 5 - Consent Form (Actor)

Project title: Learning Spanish language and culture; a virtual reality.
Project Supervisors: Dr Elba Ramirez and Dr Claudio Aguayo
Researcher: Karen Peredo

☐ I agree to take part in the research study named above.
☐ I have read and understood the Actor Information Sheet for this study.
☐ The nature and effects of the study have been explained to me.
☐ I understand that the study involves one filming session at AUT City Campus.
☐ I understand that I will be featured in a video for educational purposes.
☐ Any questions that I have asked to have been answered to my satisfaction.
☐ I understand that the researcher will maintain confidentiality and that any information I supply to the researcher will be used only for the research.
☐ I understand that the results of the study will be published so I cannot be identified as a participant.
☐ I understand that my participation is voluntary and that I may withdraw at any time without any effect.
☐ I understand that this consent will remain in force unless it is cancelled by me.
☐ I have read this release and am fully familiar with its contents. I have had sufficient time to review and seek the explanation of the provisions contained above, have carefully read them, and understood them fully and I agree to be bound by them.
☐ I agree this authority will remain in force until I cancel (any future use of my name and Imagery) by giving my notice in writing, and that all previously produced materials will continue to be in circulation.
☐ I wish to receive a summary of the research findings (please tick one): Yes☐ No☐

Participant's name:
……

Participant's signature:
……

Email: ……. Phone: …….

Date: ……

Appendix 6 - Topics of Discussion and Indicative Questions for Online Meetings

Project title: Learning Spanish language and culture; a virtual reality.
Project Supervisors: Dr Elba Ramirez and Dr Claudio Aguayo
Researcher: Karen Peredo

Developing a Virtual Learning Environment following a Design-Based Research methodology.
Please take a few minutes to read these questions. Our research team welcomes your feedback. Your responses will be kept confidential.

Indicative Discussion Topics

- ✓ Foreign language teaching and learning,
- ✓ interculturalism, intercultural skills,
- ✓ digital learning platforms, characteristics of effective virtual learning environments,
- ✓ cultural teaching resources,
- ✓ the role of culture in language classrooms,
- ✓ digital classroom design, 360-degree video learning,

Indicative Questions for Online Meetings

- ✓ What features would you like to see on the virtual interface? E.g., videos, character information, links to other websites or digital resources, give examples.
- ✓ What useful characteristics of a virtual learning environment can you think of?
- ✓ What do you think about 360-degree video learning?
- ✓ How would you introduce a historical character in cultural teaching?
- ✓ How do you implement cultural aspects in the classroom?
- ✓ What helps students communicate?
- ✓ Would voice recording be better than typing or selecting answers from a drop-down box?
- ✓ What type of vocabulary should this platform focus on? What levels should it target?
- ✓ How could learning modules be categorised/named? What would be the related vocabulary?
- ✓ What do you think of the proposed design concepts?
- ✓ Shall the platform/app have a gamification feature?
- ✓ Shall the app be more of a cultural tool or a language practice tool?
- ✓ What limitations can you think of?
- ✓ Would access to other websites improve comprehension or facilitate scaffolding?
- ✓ Would not having any knowledge of interculturalism be a disadvantage?

Appendix 7 – 'Usability and Content' Questionnaire Google Form

Demographic and Language questions

- Are you or have you been a: Student of Spanish/ a teacher/ a Educational Technologist
- Are you a native speaker of Spanish?
- Have you ever been in a Spanish-speaking country?
- Is the content in the platform relevant to the Spanish language and culture?
- Are cultural aspects in the platform applicable to real life situations?
- Is the level of language in the platform challenging for students of 15-19 years of age?
- This platform helped me develop general cultural understanding of the Latin American community
- I felt fully involved while navigating the platform
- The information provided through the different virtual environments was consistent
- Overall, I think this platform could be a good learning tool

Independent and Collaborative Learning

- Do you think you can apply what you have learned or seen here to other situations?
- Do you think you were actively engaged?
- Do you think there are opportunities for self-directed learning?
- Can this platform encourage independent learning?

Usability

- Is the platform easy to navigate?
- I was able to navigate the environments without major technical issues
- Is the prototype immersive? Did you feel you were present in the galleries or auditoriums?
- We are aware of some sound issues; however, do you think the quality of the sound/picture is to a good standard overall?
- I can easily rotate the 360-degree screen
- I can easily observe objects from various perspectives
- It is easy to interact with other websites while using this platform
- The platform creates a sense of presence, which helps me learn vocabulary effectively
- I adjusted to the virtual environment experience quickly

Qualitative Questions

- If you are a teacher, what aspect of the platform do you see transferable to your teaching context, and why?
- If you are a student of Spanish, what aspects of the platform do you see transferable to practising the language in a real situation, and why?
- If you are a technologist, what are aspects of the platform could be improved to augment user experience?
- Can you describe your learning experience in three words?

- What do you think facilitates vocabulary learning?
- In which ways do you find it useful/not useful or successful/unsuccessful?
- Did you learn anything new? Were you satisfied with your learning?
- Did you feel comfortable or unfamiliar learning on the platform?
- Are there opportunities for interactions with others or other platforms?
- How would you sum up your experience?
- How can we improve your experience?
- What capabilities/features did you use or like most?
- What capabilities/features helped you learn or engage most?
- Do you have any last comment you wish to add?

Appendix 8 – e-Learning Storyboard

The following were instructions for panellists and some examples of three scenes.

Instructions

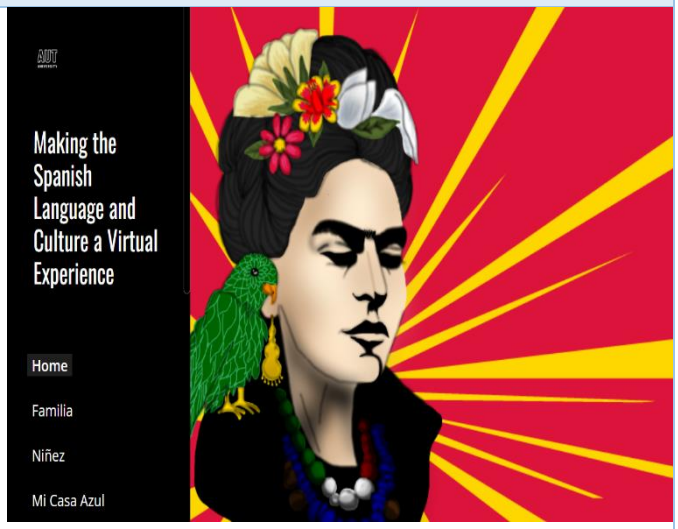
- This is a visual e-Learning storyboard for Making the learning of the Spanish language and culture a virtual experience in Aotearoa New Zealand project
- Many of the slides/webpages throughout this storyboard include placeholder icons, buttons, and text that are in a devising process. Nothing is set in stone.
- This storyboard does not represent the final look and feel of the website or Hubs Gallery or Escape Rooms (these are option platforms). This is simply an outline of the page content/exhibition room/escape room to give you an estimate of the layout and the **Reference Painting**.
- As you review this storyboard, focus on Content, Usability, Authenticity of Cultural aspects, Accuracy of language and structure.
- Please, when you make edits to the content, make sure that you add a comment or track changes or tag your name. Do add content and comments, please. This will allow me to track what has and has not been changed.
- The idea is to create connections and links between the script content and the Reference Painting to create interactivity, tasks, games, etc, here there is a basic idea – questions: how can we make the script/story more dynamic, engaging, interactive? Can we add more cultural content to the script? How can we create a game where users need CLUES from the script to continue going to the next page/room.

Design Plan and Lesson Objectives

- To understand, ask about and express events or facts in the past
- To recognise, ask about and express likes and dislikes, giving opinions and reasons, wishes and intentions
- To understand and express descriptions of activities, events, and facts in a sequence
- To express and respond to concerns, surprise, happiness and interest about an event or fact

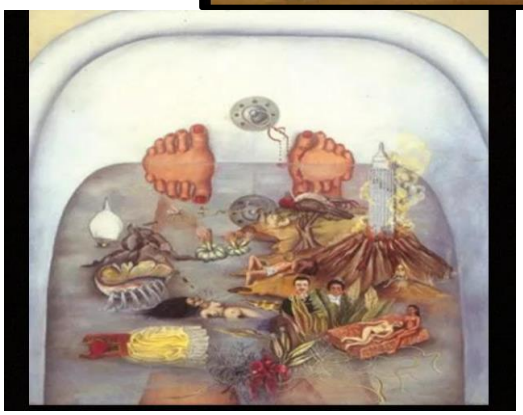
Page Title: Me Presento

Learning Objectives: To hear instructions about Tour and to practice the present tense.

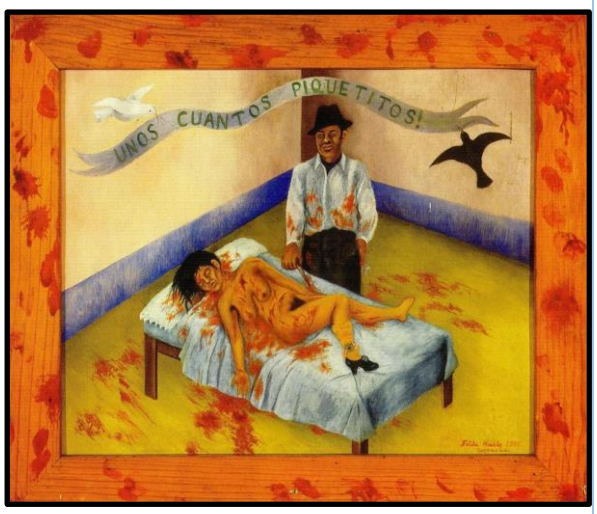
Video Narration	On-screen Image in Sample Page + Reference Painting
Script: Hola me presento, soy Frida Kahlo. Soy una gran artista y personaje de muchos documentales, películas y libros. Normalmente aparezco en revistas de arte y cultura popular. Mis pinturas son presentadas en museos de todo el mundo. De hecho, mi casa es un museo. ¡Mi casa ha sido transformada en un museo virtual, tienes que visitarla! Se llama La Casa Azul. Continúa conociendo un poco más de mí. Cuando llegues a Mi Familia obtendrás tu primera pregunta. Hazle clic a las esferas y serás teletransportado al portal. **Recommended location to shoot:**	
Interactivity & Programing Notes The learner will click the **Continua/Empieza icon** buttons to start Tour. A pop-up window will then appear.	
On-Screen Content **Title**: Me Presento **ICON + TEXT:** Empieza **Instructions to Users** for Content Creation and Sharing Content in the platform Continúa conociendo un poco más de mí. Cuando llegues a Mi Familia obtendrás tu primera pregunta. Hazle clic a las esferas y serás teletransportado al portal.	**Possible Interactive Platform** Google Site Mozilla Escape Rooms

Fertilidad

Page Title: Fertilidad
Learning Objectives: To practice relationship vocabulary and Preterit and Imperfect Tense.

Video Narration	**On screen Image in Sample Page + Reference Painting**
Script: Sufrí mucho en los Estados Unidos y mientras estaba allí pinté bastante para sanarme. Mi relación con Diego era apasionada, pero sufría con él. Siempre quise tener hijos, pero nunca pude hacerlo. Quedé embarazada tres veces, y las tres veces los perdí. Aborte a mis tres hijos involuntariamente y fue un dolor inmenso. Dios da y quita, y él sabe lo que hace. Mi Nacimiento y Hospital Henry Ford son obras que pinte el mismo año en 1932. En estas pinturas mi intención era exponer mis órganos internos, representar mi cuerpo sangrando y roto, para mostrar cómo me sentía en el exterior. Estaba conectada con todo lo que me rodeaba, pero era una madre sin hijos. «Siento que te quise siempre, desde que naciste, y antes, cuando te concibieron. Y a veces siento que me naciste a mí« Cuando termines tus respuestas, hazle clic a las esferas y serás teletransportado a la siguiente galería virtual que trata sobre mi vida con Diego. ¡Ojalá lo estés pasando muy bien en tus viajes!	**Title:** 
Interactivity & Programing Notes	
Aquí van algunas preguntas para ti, elige las que quieras contestar. Deja tus respuestas en este auditorio de la forma que gustes. 1. ¿Es el aborto legal en tu país? 2. ¿Crees que el aborto debería ser legal, gratuito y de calidad en todos los países? 3. Escribe por lo menos tres países en español en los que el aborto sea legal. 4. ¿Conoces las bandanas que se utilizan	

como símbolo a favor del aborto? Busca una imagen y déjala aquí.	
On-Screen Content Title: Matrimonio ICON + TEXT: Continua Recommended location to shoot: Instructions to Users for Content Creation and Sharing Content in the platform	**Possible Interactive Platform** Google Site Mozilla Escape Rooms

Page Title: Mi Segundo Accidente **Learning Objectives: To practice vocabulary related to relationships, social and personal issues and Present Tense.**	
Video Narration	**On screen Image in Sample Page + Reference Painting**
Script: Diego también pintaba como yo y fue un artista de murales muy popular en México durante esa época. Ten en cuenta que, Diego era un pintor famoso y muy mujeriego, o sea, tenía relaciones con muchas mujeres al mismo tiempo. Por eso siempre digo que "hubo dos grandes accidentes en mi vida. Uno fue el tranvía y el otro fue Diego. Diego fue lejos el peor." La verdad que sí, tuve muchos problemas con Diego porque era un casanova, un donjuán. Diego me era infiel con otras mujeres, sin embargo, yo lo quería mucho. Diego y yo estuvimos casados por 25 años, pero nos divorciamos por "un año" porque él me engañó con mi hermana Cristina. "Cría cuervos y te sacarán los ojos". Al final, Diego y yo estuvimos solo un año separados y luego nos volvimos a casar porque nos dimos una segunda oportunidad. El consejo es que "después de la tormenta, llega la calma". Este cuadro "*Unos cuantos piquetitos*" lo pinte con la causa feminista en mente. Es un cuadro que denuncia abusos. Esa mujer asesinada era en cierto modo yo, a quien Diego asesinaba todos los días. O bien era la otra, la mujer con quien Diego podía estar y a quien yo hubiera querido hacer desaparecer. Sentía en mí una buena dosis de violencia, no puedo negarlo, la manejaba como podía. «El dolor no es parte de la vida, se puede convertir en la vida misma».	**Title:** 

Hazle clic a las esferas y serás teletransportado al siguiente portal. ¡Ojalá estés disfrutando de los viajes!	
Interactivity & Programing Notes	
"Cría cuervos y te sacarán los ojos" y "después de la tormenta, llega la calma" son refranes populares, ¿cuál de estos dos dichos es para referirse a algo negativo? cómo los utilizarías para contar un pedacito de tu vida?	
On-Screen Content **Title**: Romance **ICON + TEXT:** Continua **Recommended location to shoot:** **Instructions to Users** for Content Creation and Sharing Content in the platform	**Possible Interactive Platform** Google Site Mozilla Escape Rooms

Appendix 9 – Frida's Script

The following are scenes for Part 4.

Título Escena: Auditorio Virtual Frida - Mi Estilo

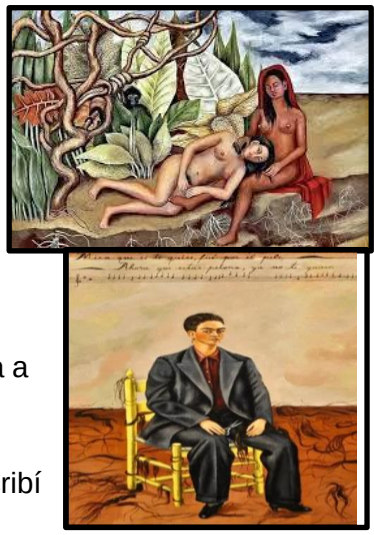
Cuando me recuperé y salí de la cama después del accidente, me propuse vivir la vida al cien. Porque no hay que llorar que la vida es un carnaval, como decía Celia, ¿la conoces?
Bueno, te sigo contando, el accidente me ayudó a convertirme en una persona muy determinada y optimista. Tenía mucho coraje y determinación. Después de mucho tiempo y perseverancia logré caminar. Tenía una personalidad bastante inquieta, mi sentido del humor era un poco negro y tenía la necesidad de expresar lo que experimentaba de muchas formas. Me encantaba expresar mi individualidad con mis prendas de vestir. Por ejemplo, me encantaba llevar ropa colorida y que representara mi estado de ánimo y también mi cultura. Mi estilo de ropa era diferente para la época. Normalmente, llevaba faldas amplias, blusas bordadas, peinados muy elaborados con flores bellísimas. Me gustaba combinar distintas prendas y materiales indígenas de estilo Tehuana con elementos y accesorios contemporáneos. A Diego le gustaba mucho mi ropa típica mexicana. Le gustaban mis faldas largas de colores brillantes y mis blusas bordadas con flores. y a ti te gustan los accesorios de moda?
A mi madre le gustaba traer accesorios para mi pelo porque yo tenía el pelo muy largo y mi madre lo cuidaba y decoraba mucho.
A ella le gustaba ponerme flores y cintas.

Elige una de las siguientes tareas:

- Tu tarea es dejar un comentario o fotografía sobre tu estilo de moda, o
- Escribe una descripción de la vestimenta tradicional en un país latinoamericano. Incluye detalles de los textiles, colores y decoraciones especiales.
- O puedes escribe sobre un personaje influyente de tu país ¿Cómo expresa su individualidad?

Cuando termines hazle, clic a la esfera que te llevará al siguiente auditorio. ¡Buena suerte en todo!

Título Escena: Auditorio Virtual Frida -Identidad Sexual



Como mujer viví una libertad sexual, algo que era poco común para las mujeres entre los años 30 y 40. Mi matrimonio no fue un impedimento para relacionarme con otros hombres y mujeres en diferente grado de intimidad y afecto. De hecho, fueron los dolores de mi matrimonio los que me llevaron a incursionar y probar nuevos amores. La gente de esa época se escandalizaba y eso me hacía mucha gracia. Me declaré bisexual y viví respetando esa decisión. No se puede corregir a la naturaleza. Palo que nace doblado, jamás su tronco endereza.

En esta pintura llamada Dos Desnudos en el Bosque de 1939, hago una declaración expresamente abierta sobre mi bisexualidad. Le dediqué esta obra a Dolores del Río, una de las primeras actrices latinoamericanas que triunfó en Hollywood. Nunca pinto sueños o pesadillas. Pinto mi propia realidad.

Autorretrato con Cabello Corto lo pinté después de divorciarme de Diego y escribí la letra de una canción que dice así:

"Mira, si te quise fue por el pelo, ahora que estás pelona, ya no te quiero".

Elige una de las siguientes actividades:

- Estudiantes, ahora busquen la escena en YouTube de la película Frida del año 2002, con Salma Hayek, donde me corto el pelo. ¿Quién canta la canción de esta escena y conoces su relación con Frida Kahlo?
- O puedes investigar la canción llamada *un gran varón*. Deja una foto que simbolice la libertad de expresión.

Cuando termines hazle, clic a la esfera que te llevará al siguiente auditorio. ¡Y que viva la revolución!

Título Escena: Auditorio Virtual Frida - Revolución y Política

Diego y yo vivimos un tiempo en los Estados Unidos. No me gustaban los Estados Unidos porque para mí era aburrido, no tenía amigos, familia o mi pueblo cerca. Pero pasé mi tiempo pintando y conociendo sus ciudades. Fueron meses productivos y de mucho trabajo.

Entre esos años, pintaba por muchas razones. Por ejemplo, pintaba para expresar mis penas y dolores. Pintaba cuando extrañaba a mi familia y México, mi país. El tiempo lo cura todo… dicen.

La gente en los Estados Unidos pensaba que yo era rara, porque mi ropa era rara y hablaba raro. Hablaba de revolución y de política. Hablaba del comunismo y de las artes. Representaba a los pueblos indígenas con orgullo y eso era raro. Tenía opiniones controversiales sobre temas como la revolución mexicana, las tradiciones indígenas, el feminismo y la identidad sexual. Aunque lo pasé mal, también fui muy feliz. "Viva la vida, viva la revolución cabrones".

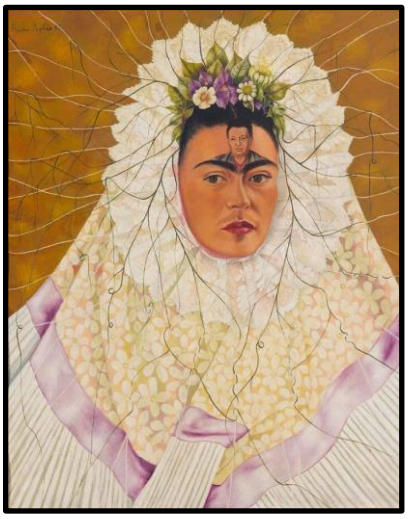
Ahora debes elegir una de estas tareas:

- Estudiantes ¿Cuál o cuáles son los pueblos indígenas originales de tu país?
- ¿Conoces a algún pueblo originario de latino América? Déjame un comentario o imagen.
- Investiga un evento significativo en tu país, ¿Qué sucedió? ¿Quiénes eran las personas? ¿Cuáles fueron las consecuencias de este evento histórico?

Hazles clic a las esferas y serás teletransportado al siguiente portal donde podrás aprender sobre todos mis autorretratos y que te diviertas.

Título Escena: Auditorio Virtual Frida - Autorretratos

Pinto autorretratos porque estoy mucho tiempo sola. Me pinto a mí misma, porque soy a quien mejor conozco. Soy mi propia musa. Soy el tema que quiero conocer mejor.



Todos los autorretratos que pinté en momentos de dolor de alguna u otra forma valieron la pena. La pintura llena mi vida, lo sustituyo todo. Creo que no hay nada mejor que el trabajo. Hice muchos autorretratos y trabajé mucho, pero el trabajo no mata a nadie. Pinté 143 cuadros y entre ellos 55 autorretratos, selfis. Tengo 55 autorretratos y fui la primera reina de los selfis. Hay algunos que nacen con estrella y otros estrellados y aunque tú no lo quieras creer, yo soy de las estresadísimas.

Pintaba flores, raíces, árboles y animales. Pintaba desiertos y jardines llenos de vida. Pintaba para expresarme y sobre todo pintaba mi rostro porque yo era la persona que mejor me conocía.

Te dejo un consejo, amiga y amigo mío, enamórate de ti, de la vida y luego de quien tú quieras.

Espero que hayas disfrutado del viaje. Has llegado a tu destino final. Muchas gracias por darte el tiempo para conocer un poco más de mí y de mi trabajo como artista.

- Deja una huella en este lugar en forma de poema, autorretrato o comentario. Y pinta flores para que así no mueran
- Elige tus colores favoritos y crea una pintura vibrante. Considera los colores que utilizarás. Pon tu foto en un marco y muéstrala en tu pared.

Hazle clic a la siguiente esfera, aquí encontrarás la última galería sobre mis autorretratos. Disfruta.

Appendix 10 – Unit Plan, Lessons, Instruction Cards and Teachers' Notes.

OUTLINE: UNIDA INTERCULTURAL – La vida y el Arte de Frida Kahlo		
Duration: 4 lessons **SPA level: L2/L3 NCEA**		
Learning objectives • To understand, ask about and express events or facts in the past • To recognise, ask about and express likes and dislikes, giving opinions and reasons, wishes and intentions • To understand and express descriptions of activities, events, and facts in a sequence • To express and respond to concerns, surprise, happiness and interest about an event or fact		
Key Competencies	**Topics and language features**	***Content and language learning outcomes***
Managing self – self-motivation, personal goals, appropriate behaviour, resourcefulness, sense of self and importance of heritage. **Using language, symbols, and texts –** interpreting language and symbols, using ICT, and recognising how choices of language and symbols affect people's understanding. **Learning to learn** Students will become familiar with a range of effective learning strategies. **Relating to others –** listen actively, recognise different points of view, negotiate and share ideas.	**Main Topics:** Family Childhood Youth A horrible accident In bed sick My Diego, my love Fertility My lifestyle Gender Identity Revolution and Politics Arts **Vocabulary development** Introducing oneself Descriptions Family members Daily routine Adjectives (like/dislike) Health/Illness Sports and exercise Idioms Proverbs Art, Music Traditional Celebrations **Lang Structures** Prepositions Past Tense (imperfect, preterit, perfect)	**Students will:** • become familiar with Spanish vocabulary about everyday situations • learn to listen to tasks instructions in Spanish • interact with others in pairs and group work. **Students will:** • create original responses in diverse shapes and forms • use Spanish (present, past or future tenses to write responses or talk about the learning experiences, etc) **Students will:** • encourage independent vocab learning • learn unknown words from the script • learn high-frequency topic-related words.

Thinking – using creative, critical, metacognitive and reflective processes, drawing on personal knowledge and intuitions. Relating to others – listen actively, recognise different points of view, negotiate, and share ideas.	Imperatives Interrogative pronouns Stem-changing – Irreg. verbs in past, imperfect tense Reflexive verbs Preterit Past Tense (imperfect, preterit, perfect) Imperatives Interrogative pronouns Comparative/superlative.	**Extension- Reflecting on** ● Encourage learners to reflect on symbolism, body language, facial expressions, tone of voice and volume etc, from the videos ● Group discussions on similarities and differences between NZ, students' own countries and Latin American countries. **Learning to learn** • Students will become familiar with a range of effective learning strategies such as directing own learning.

Lesson 1-4 UNIDA INTERCULTURAL – La vida y el Arte de Frida Kahlo				
ACTIVITY	**ESCENAS Y GALERÍAS**	**TOPICS/VOCAB**	**LANG STRUCTURES**	**DIGITAL RESOURCES**
Students to get into groups of 3-4 to visit	**CARD 1 Auditoriums and Gallery Exhibitions** Presentación Familia Niñez	Introduce oneself Descriptions Family members Daily routine Adjectives (like/dislike) Health/Illness Sports and exercise Idioms Proverbs Art, Music Traditional Celebrations	Present Tense Past Tense (imperfect, preterit, perfect) Demonstrative pronouns Possessive adjectives Adjectives Subjunctive	Google Google Art and Culture Google Docs and Forms E-Dictionary YouTube Gifs and pictures
Students to get into groups of 3-4 to visit:	**CARD 2 Auditoriums and Gallery** Juventud Un Accidente Horrible En cama	Descriptions School subjects Family relations Physical, personality & character Descriptions Professions, personal info Body parts Idioms Proverbs Art	Prepositions Past Tense (imperfect, preterit, perfect) Imperatives Interrogative pronouns Stem-changing – Irreg. verbs in past, imperfect tense Reflexive verbs	Google Google Art and Culture Google Docs and Forms E-Dictionary YouTube gifs Pictures
Studentsto get into groups of 3-4 to visit:	**CARD 3 Auditoriums and Gallery** Romance Matrimonio Fertilidad	Relationships Family Abortion Physical, personality & character Descriptions Art, Music Idiom Feminism	Preterit Past Tense (imperfect, preterit, perfect) Imperatives Interrogative pronouns Comparative/superlative	Google Google Art and Culture Google Docs and Forms E-Dictionary YouTube gifs Pictures Google Maps
Students to get into groups of 3-4 to visit:	**CARD 4 Auditoriums and Gallery** Mi Estilo de vida Identidad Sexual Revolución y Política Autorretratos	Professions, personal info social issues Indigenous hopes and wishes Descriptions Clothing and accessories Politics Selfies Self-care Giving advice Numbers/years Art	Past Tense (imperfect, preterit, perfect) Imperatives Interrogative pronouns Subjunctive Interrogative pronouns	Google Google Art and Culture Google Docs and Forms E-Dictionary YouTube gifs Pictures Google Maps

Instructions Cards - Students

CARD 1

Each group needs to visit: THREE Virtual Auditoriums AND ONE Gallery

- **Presentación Auditorium**
- **Familia Auditorium**
- **Ninez Auditorium**
- **Mi Familia Gallery**

Users watch video content about Frida's different life stages and collect information to complete tasks requested by Frida at the end of each scene.

Students are encouraged to create digital content by dropping links, images, gif, sticky notes, or related videos.

Presentación Auditorium

Ahora déjame un comentario:

1. ¿Puedes escribir algunos saludos en español?

Familia Auditorium

Elige una de las siguientes tareas:

2. Tu primera tarea es encontrar el nombre y autor de esta canción. ¿Quién canta "la vida te da sorpresas, sorpresas te da la vida" y como se llama la canción?
3. Deja un mensaje de motivación para tus familiares o
4. Dibuja un árbol genealógico de tu familia idea. ¡Sean muy creativos!

Niñez Auditorium

Elige una de las siguientes actividades:

5. Tu siguiente tarea es encontrar la versión de este proverbio en inglés. Entonces ¿Cómo se dice "la ociosidad es la madre de todos los vicios" en inglés?
6. ¿Sabes que es una piñata? Busca una fotografía de una piñata que identifique a tu grupo. ¿Dónde se originaron las piñatas?
7. ¿Qué tipo de comida comen para celebrar cumpleaños en tu país? Haz un dibujo de tu plato favorito.

Mi Familia Gallery

8. Learners are encouraged to reflect on symbolism, body language, facial expressions, tone of voice and volume etc, from the videos
9. Learners are encouraged to create discussions on similarities and differences between NZ,

CARD 2

Each group needs to visit: THREE Virtual Auditoriums AND ONE Gallery

- **Juventud Auditorium**
- **Un Accidente horrible Auditorium**
- **Postrada en cama Auditorium**
- **Mi Juventud Gallery**

Users watch video content about Frida's different life stages and collect information to complete tasks requested by Frida at the end of each scene.

Students are encouraged to create digital content by dropping links, images, gifs, sticky notes, or related videos.

Juventud Auditorium

Completa la siguiente actividad:

1. Ahora tienes que encontrar un objeto o una imagen que represente este refrán "árbol que crece doblado jamás su tronco endereza". The English equivalent is "a leopard cannot change his spots". Deja la foto, dibujo u objeto 3D, por ejemplo, un gif en este auditorio para observar la diferencia en interpretaciones.

Un Accidente Horrible Auditorium

Completa la siguiente actividad:

2. ¿Puedes imaginar un accidente así? Busca tres adjetivos para describir esta etapa de mi vida. Puedes encontrar inspiración en este cuadro llamado La Columna Rota.

Postrada en una cama Auditorium

Completa la siguiente actividad:

3. Ahora tienes que navegar por internet y encontrar una imagen mía donde esté pintando con el espejo arriba de mi cama. Deja la foto, dibujo u objeto 3D Gif en este auditorio para observar la diferencia en interpretaciones.

Mi Juventud Gallery

4. Learners are encouraged to reflect on symbolism, body language, facial expressions, tone of voice and volume etc, from the videos
5. Learners are encouraged to create discussions on similarities and differences between NZ, students' own countries and Latin American countries.

students' own countries and Latin American countries. Once activities are completed, meet with your class in your preferred virtual or face-to-face location to share knowledge and discuss the experience of getting to know Frida.	Once activities are completed, meet with your class in your preferred virtual or face-to-face location to share knowledge and discuss the experience of getting to know Frida.

CARD 3	**CARD 4**
Each group needs to visit: THREE Virtual Auditoriums AND ONE Gallery ● **Diego Rivera, Mi Panzón Auditorium** ● **Mi Segundo Accidente Auditorium** ● **Fertilidad Auditorium** ● **Mi Matrimonio Gallery** Users watch video content about Frida's different life stages and collect information to complete tasks requested by Frida at the end of each scene. Students are encouraged to create digital content by dropping links, images, gif, sticky notes, or related videos. **Diego Rivera, Mi Panzón Auditorium** Ahora debes completar la siguiente tarea: 1. Hay muchos grafitis, murales y estatuas tipo monumentos realizados en nuestro honor en México. ¿Puedes encontrar un ejemplo y su ubicación con Google Maps? Comparte el contenido en este portal. **Mi Segundo Accidente Auditorium** Vamos por la próxima actividad: 2. "Cría cuervos y te sacarán los ojos" y "después de la tormenta, llega la calma" son refranes populares, ¿cuál de estos dos dichos es para referirse a algo negativo? cómo los utilizarías para contar un pedacito de tu vida? 3. Investiga la canción "Sin Miedo" de Mon Laferte y Vivir Quintana. ¿Cuál crees que es la parte más potente de la canción? **Fertilidad Auditorium** Elige una de las siguientes actividades: Aquí van algunas preguntas para ti, elige las que quieras contestar. Deja tus respuestas en este auditorio de la forma que gustes. 1. ¿Es el aborto legal en tu país?	Each group needs to visit: THREE Virtual Auditoriums AND ONE Gallery ● **Mi Estilo Auditorium** ● **Identidad Sexual Auditorium** ● **Revolución y Política Auditorium** ● **Autorretratos Auditorium** ● **Mis Autorretratos Gallery** Users watch video content about Frida's different life stages and collect information to complete tasks requested by Frida at the end of each scene. Students are encouraged to create digital content by dropping links, images, gif, sticky notes, or related videos. **Mi Estilo Auditorium** *Elige una de las siguientes tareas:* 1. Tu tarea es dejar un comentario o fotografía sobre tu estilo de moda, o 2. Escribe una descripción de la vestimenta tradicional en un país latinoamericano. Incluye detalles de los textiles, colores y decoraciones especiales, o 3. Puedes escribir sobre un personaje influyente de tu país ¿Cómo expresa su individualidad? **Identidad Sexual Auditorium** *Elige una de las siguientes actividades:* 4. Estudiantes, ahora busquen la escena en YouTube de la película Frida del año 2002, con Salma Hayek donde me corto el pelo, o 5. Puedes investigar la canción llamada Un Gran Varon. Deja una foto que simbolice la libertad de expresión. **Revolución y Política Auditorium**

2. ¿Crees que el aborto debería ser legal, gratuito y de calidad en todos los países? 3. Escribe por lo menos tres países en español en los que el aborto sea legal. 4. ¿Conoces las bandanas que se utilizan como símbolo a favor del aborto? Busca una imagen y déjala aquí. **Mi Matrimonio Gallery** 5. Learners are encouraged to reflect on symbolism, body language, facial expressions, tone of voice and volume etc, from the videos 6. Learners are encouraged to create discussions on similarities and differences between NZ, students' own countries and Latin American countries. Once activities are completed, meet with your class in your preferred virtual or face-to-face location to share knowledge and discuss the experience of getting to know Frida.	*Ahora debes elegir una de estas tareas:* 6. Estudiantes ¿Cuáles son los pueblos indígenas originales de tu país? 7. ¿Conoces a algún pueblo originario de latino América? Déjame un comentario o imagen. 8. Investiga un evento significativo en tu país, ¿Qué sucedió? ¿Quiénes eran las personas? ¿Cuáles fueron las consecuencias de este evento histórico? **Autorretratos Auditorium** Muchas gracias por darte el tiempo para conocer un poco más de mí y de mi trabajo como artista. 9. Deja una huella en este lugar en forma de poema, autorretrato o comentario. Y pinta flores para que así no mueran 10. Elige tus colores favoritos y crea una pintura vibrante. Considera los colores que utilizarás. Pon tu foto en un marco y muéstrala en tu pared. **Mi Matrimonio Gallery** 11. Learners are encouraged to reflect on symbolism, body language, facial expressions, tone of voice and volume etc, from the videos 12. Learners are encouraged to create discussions on similarities and differences between NZ, students' own countries and Latin American countries. Once activities are completed, meet with your class in your preferred virtual or face-to-face location to share knowledge and discuss the experience of getting to know Frida.

Teachers' Notes

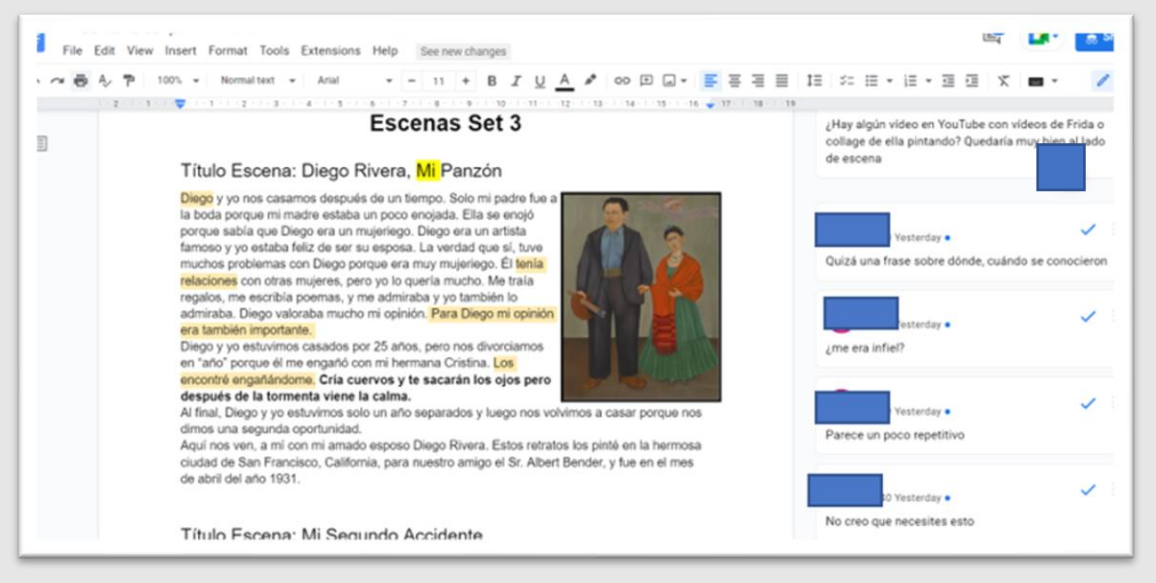
- Lesson activities can be completed at the end of a term when students can understand and utilise the vocabulary they have acquired in previous lessons. This resource was created to be used by teachers in a variety of teaching situations, activities aim to revisit vocabulary and structures in diverse ways to re-enforce the learning of the language.
- Tasks challenge learners to go from surface thinking to a deeper level of analysis and explanations of choices depending on the video they are watching.
- As part of language topics, each scene explores an aspect of Latin American culture. To promote intercultural learning, this resource fosters reflection by learners and establishes relevant connections with New Zealand.

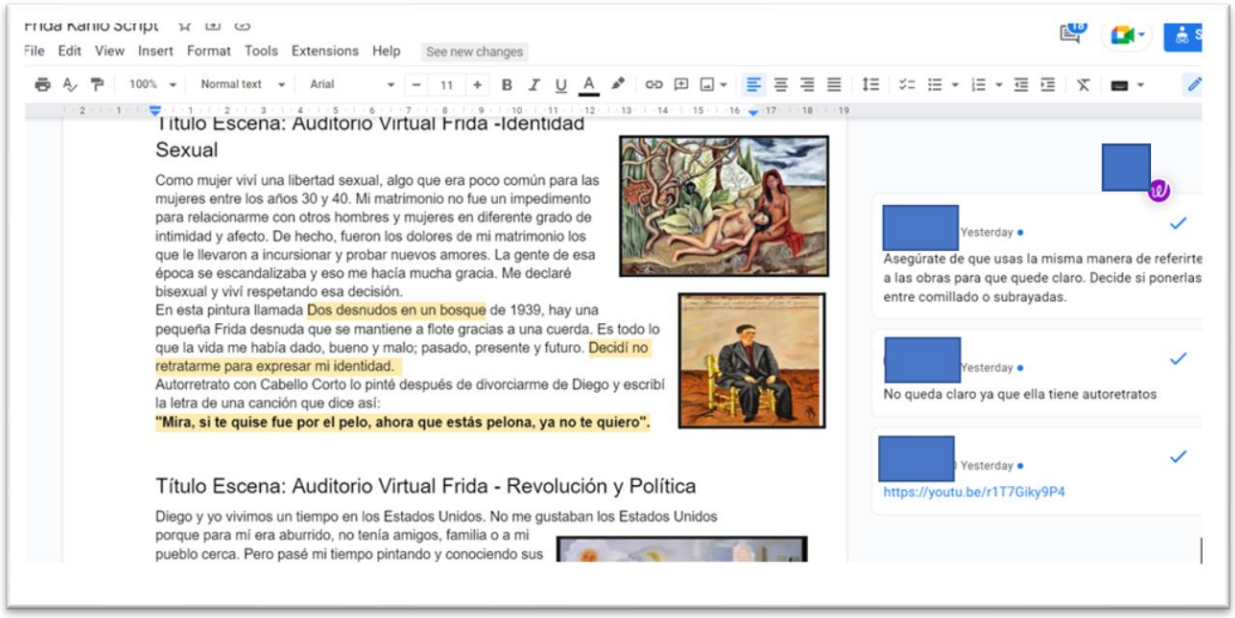
- Tasks are about getting to know an important artist from a Spanish-speaking country, reviewing their biography and considering how their work was influenced by their surroundings.
- Learners will be able to recycle and practise what they know in different and creative ways across all skills.
  Learners' different abilities, personalities, learning preferences, strategies and other factors are to be considered when grouping occurs.
- The digital platforms presented here would be appealing to adolescents learning Spanish as they promote communicative and interactive use of language, take individual learning preferences and strategies into account, encourage teamwork, and creates an 'extrinsic motivation' atmosphere which might influence learners.
- These lessons can be reused and recycled, group A with CARD 1 can be group C with CARD 2 next class and can visit the rooms they did not get to see in the first excursion.

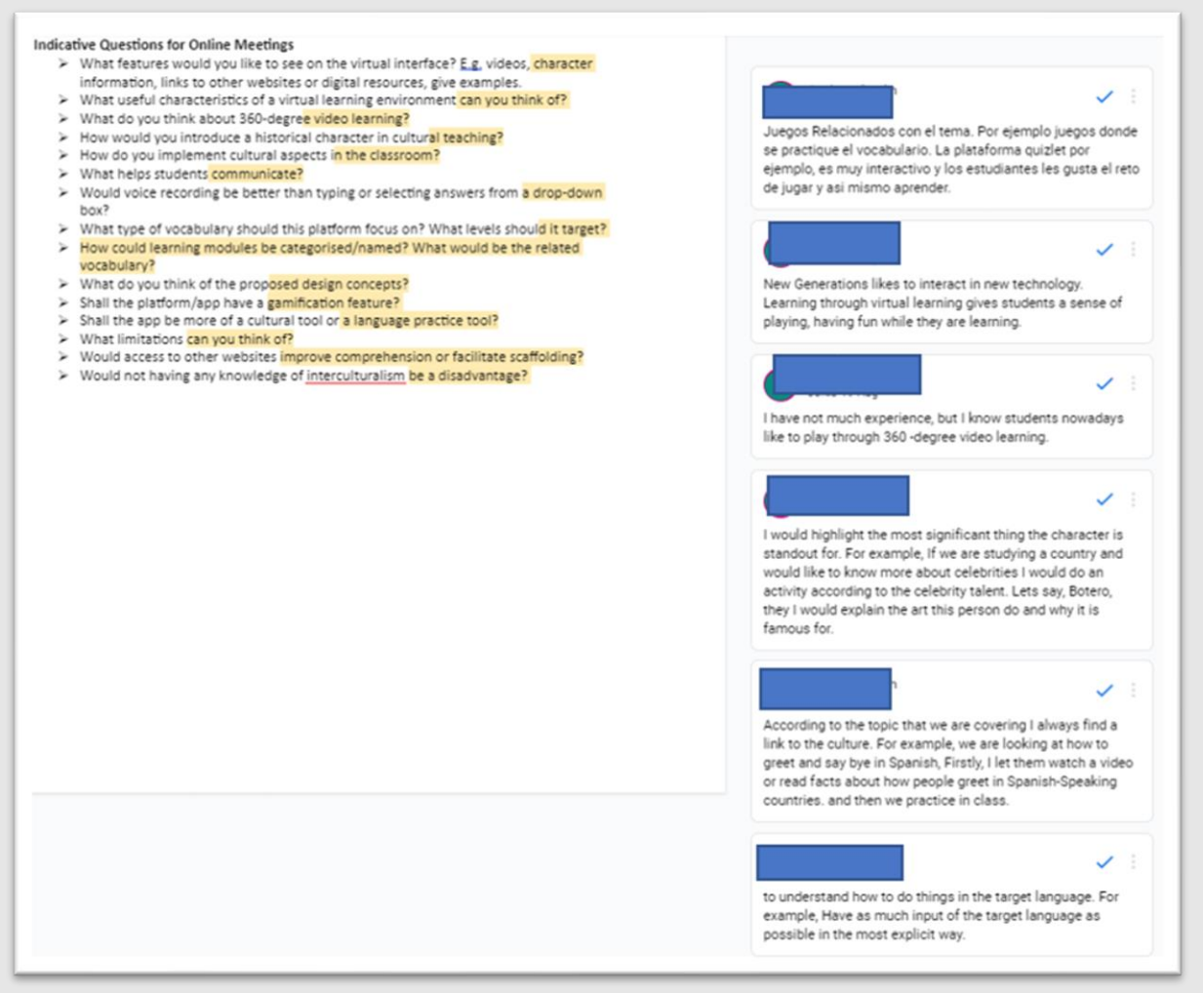
Appendix 11 – Imagines Panellist Contributions

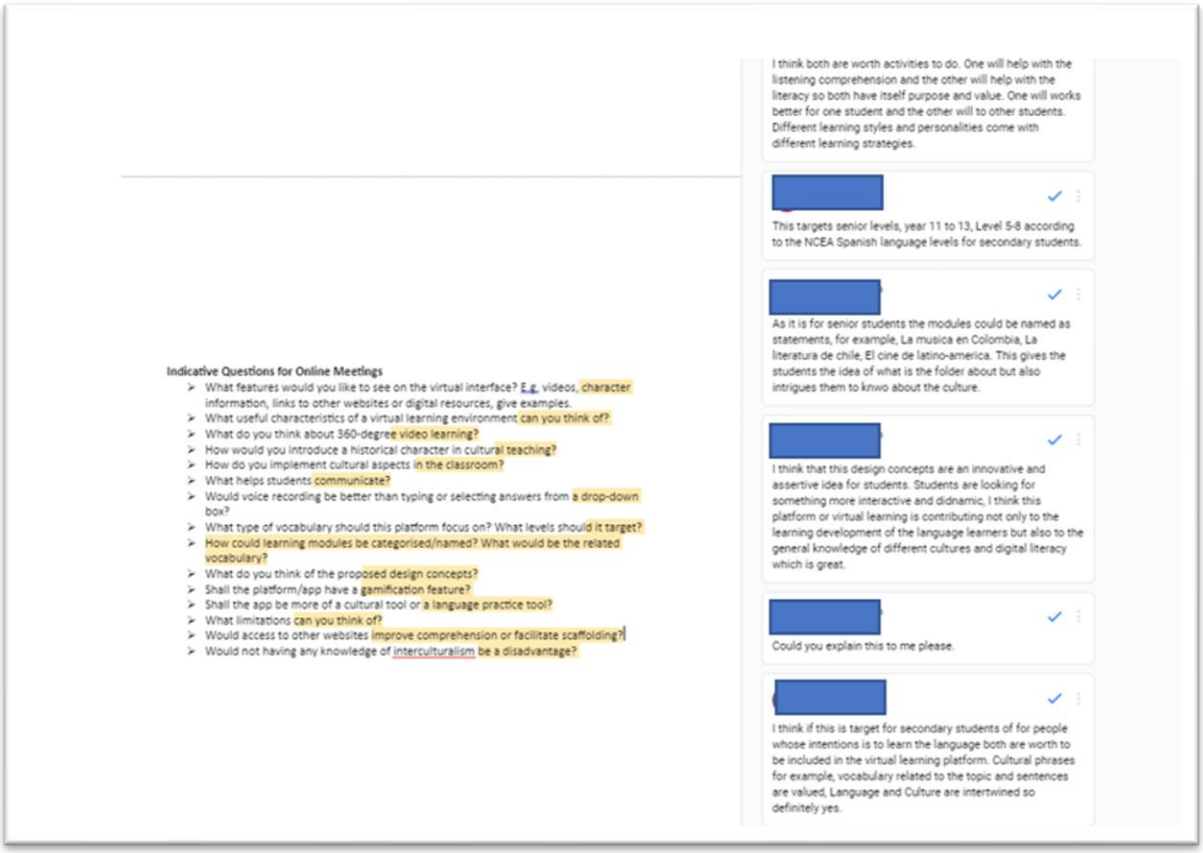
The following is the feedback received from Antonia via Google Docs.

Figure – *Phase 1 Scripting Feedback Process*




Frida Kahlo Script
File Edit View Insert Format Tools Extensions Help See new changes
Título Escena: Auditorio Virtual Frida -Identidad Sexual
Como mujer viví una libertad sexual, algo que era poco común para las mujeres entre los años 30 y 40. Mi matrimonio no fue un impedimento para relacionarme con otros hombres y mujeres en diferente grado de intimidad y afecto. De hecho, fueron los dolores de mi matrimonio los que le llevaron a incursionar y probar nuevos amores. La gente de esa época se escandalizaba y eso me hacía mucha gracia. Me declaré bisexual y viví respetando esa decisión.
En esta pintura llamada Dos desnudos en un bosque de 1939, hay una pequeña Frida desnuda que se mantiene a flote gracias a una cuerda. Es todo lo que la vida me había dado, bueno y malo; pasado, presente y futuro. Decidí no retratarme para expresar mi identidad.
Autorretrato con Cabello Corto lo pinté después de divorciarme de Diego y escribí la letra de una canción que dice así:
"Mira, si te quise fue por el pelo, ahora que estás pelona, ya no te quiero".
Título Escena: Auditorio Virtual Frida - Revolución y Política
Diego y yo vivimos un tiempo en los Estados Unidos. No me gustaban los Estados Unidos porque para mí era aburrido, no tenía amigos, familia o a mi pueblo cerca. Pero pasé mi tiempo pintando y conociendo sus
Yesterday
Asegúrate de que usas la misma manera de referirte a las obras para que quede claro. Decide si ponerlas entre comillado o subrayadas.
Yesterday
No queda claro ya que ella tiene autoretratos
Yesterday
https://youtu.be/r1T7Giky9P4


Indicative Questions for Online Meetings
What features would you like to see on the virtual interface? E.g. videos, character information, links to other websites or digital resources, give examples.
What useful characteristics of a virtual learning environment can you think of?
What do you think about 360-degree video learning?
How would you introduce a historical character in cultural teaching?
How do you implement cultural aspects in the classroom?
What helps students communicate?
Would voice recording be better than typing or selecting answers from a drop-down box?
What type of vocabulary should this platform focus on? What levels should it target?
How could learning modules be categorised/named? What would be the related vocabulary?
What do you think of the proposed design concepts?
Shall the platform/app have a gamification feature?
Shall the app be more of a cultural tool or a language practice tool?
What limitations can you think of?
Would access to other websites improve comprehension or facilitate scaffolding?
Would not having any knowledge of interculturalism be a disadvantage?
Juegos Relacionados con el tema. Por ejemplo juegos donde se practique el vocabulario. La plataforma quizlet por ejemplo, es muy interactivo y los estudiantes les gusta el reto de jugar y asi mismo aprender.
New Generations likes to interact in new technology. Learning through virtual learning gives students a sense of playing, having fun while they are learning.
I have not much experience, but I know students nowadays like to play through 360 -degree video learning.
I would highlight the most significant thing the character is standout for. For example, If we are studying a country and would like to know more about celebrities I would do an activity according to the celebrity talent. Lets say, Botero, they I would explain the art this person do and why it is famous for.
According to the topic that we are covering I always find a link to the culture. For example, we are looking at how to greet and say bye in Spanish, Firstly, I let them watch a video or read facts about how people greet in Spanish-Speaking countries. and then we practice in class.
to understand how to do things in the target language. For example, Have as much input of the target language as possible in the most explicit way.



Indicative Questions for Online Meetings

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- What limitations can you think of?
- Would access to other websites improve comprehension or facilitate scaffolding?
- Would not having any knowledge of interculturalism be a disadvantage?

I think both are worth activities to do. One will help with the listening comprehension and the other will help with the literacy so both have itself purpose and value. One will works better for one student and the other will to other students. Different learning styles and personalities come with different learning strategies.

[redacted]

This targets senior levels, year 11 to 13, Level 5-8 according to the NCEA Spanish language levels for secondary students.

[redacted]

As it is for senior students the modules could be named as statements, for example, La musica en Colombia, La literatura de chile, El cine de latino-america. This gives the students the idea of what is the folder about but also intrigues them to knwo about the culture.

[redacted]

I think that this design concepts are an innovative and assertive idea for students. Students are looking for something more interactive and didnamic, I think this platform or virtual learning is contributing not only to the learning development of the language learners but also to the general knowledge of different cultures and digital literacy which is great.

[redacted]

Could you explain this to me please.

[redacted]

I think if this is target for secondary students of for people whose intentions is to learn the language both are worth to be included in the virtual learning platform. Cultural phrases for example, vocabulary related to the topic and sentences are valued, Language and Culture are intertwined so definitely yes.