

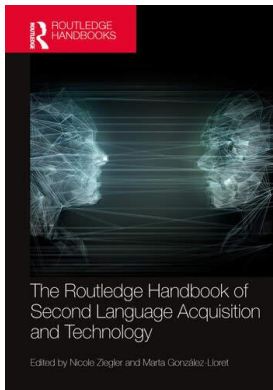
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Publisher: *Routledge*

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## **The Routledge Handbook of Second Language Acquisition and Technology**

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### **Digital Place-based Learning**

Publication details

<https://www.routledgehandbooks.com/doi/10.4324/9781351117586-26>

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**Published online on: 01 Feb 2022**

**How to cite :-** Julie M. Sykes. 01 Feb 2022, *Digital Place-based Learning from: The Routledge Handbook of Second Language Acquisition and Technology* Routledge

Accessed on: 28 Nov 2023

<https://www.routledgehandbooks.com/doi/10.4324/9781351117586-26>

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# DIGITAL PLACE-BASED LEARNING

*Julie M. Sykes*

## Introduction

### *What Is Digital Place-Based Language Learning?*

Mobile devices (i.e., smart phones, tablets, laptops) regularly offer on-the-go information that is customized to users' individual histories, interests, locations, and connections. With a 40% increase in mobile users since 2016, as of October 2020, 4.78 billion people have a mobile device (i.e., smartphone or feature phone), comprising 61.25% of the world's population (Turner, 2020). The rapid growth of mobile device use is staggering, though, in hindsight, not surprising. As people are increasingly able to access just-in-time information (e.g., reviews, location, and hours of a store nearby) and stay connected with work, friends, and family (e.g., email, text, and social media), the world has witnessed a profound shift in the way users are able to experience the places they go (Johnson et al., 2010; Squire, 2009). The field of language learning is no exception, witnessing an advent of mobile-assisted language learning (MALL) applications and place-based language learning research over the past two decades.

Not to be confused with any learning that can be done on a mobile device (i.e., mobile-assisted learning), digital place-based learning intentionally situates learning experiences in the physical world while also augmenting that experience with semiotic resources, tasks, and prompts to facilitate learning. As such, it draws on various aspects of the local environment to involve learners contextually “at cultural, historical, social, and cognitive levels” (Reinhardt, 2016), and reinforce language content through place associations (Holden & Sykes, 2011; Reinhardt, 2016).

This “situatedness” can be physically embodied (e.g., learners walk around a neighborhood) or imagined (e.g., learners experience a historical time period that has been interwoven with the physical place in which the events occurred). As such, it encourages stronger ties to local contexts and communities (Sobel, 2004) while also enabling the exploration of a multitude of time periods and learning contexts (Dubreil & Thorne, 2019). The hands-on, real-world approach of place-based language learning engages students in tasks and activities that evoke their lived realities and add meaning and relevance to language learning by connecting it to students' daily lives (Godwin-Jones, 2016; Holden & Sykes, 2011, 2013; Sykes & Holden, 2011). Moreover, exploratory and discovery-based, gameplay activities can increase learner engagement and motivation, challenging students to take ownership of their own personalized learning experience in which they co-create their learning by setting goals, defining learning paths, and impacting outcomes.

## Historical Perspectives

While present in the research literature for almost a decade prior, the release of *Pokemon Go!* brought place-based interaction to the forefront of the public eye. Spurred forward by a record 21 million players in the first week, place-based, augmented reality games have continued to receive attention for both entertainment and learning purposes. The field of place-based learning represents a decade-long effort to utilize mobile devices with locative features to enhance the learning experience. Much of the initial promising research took place in the fields of science and social studies education (Holden et al., 2015; Klopfer & Squire, 2008; Mathews, 2010; Squire et al., 2007), but quickly expanded to language learning endeavors as collaborators in a number of fields contributed to the ARIS Platform (<https://fielddaylab.org/make/aris/>), one of the first platforms designed to support user-generated, place-based experiences. While no longer supported, almost a decade after its inception, ARIS catalyzed the movement to create and research mobile, place-based learning experiences. This includes a number of place-based, AR games designed and researched for language learning purposes—*Mentira*, *Ecopod: Survival*, *Ecopod: Quake Response*, *Paris Occupé*, and *CronoOps*. It should be noted there is an adjacent body of work (see Godwin-Jones, 2016 for a review) examining the effectiveness of mobile applications (e.g., *Busuu*, *Duolingo*, *LingrotoGo*) for language learning on-the-go (see, for example, Loewen et al., 2020); however, this contribution explores research that moves beyond language learning apps delivered on mobile devices for an on-the-go experience to, instead, explore experiences directly tied to place itself, with the majority of the work utilizing place-based, mobile, augmented reality (AR) technologies.

One of the first projects to use AR technology in language learning was *Mentira*, a murder mystery set in Albuquerque, NM (Holden & Sykes 2011, Holden et al., 2016). *Mentira* utilized mobile AR technology to guide learners through a historically-situated, Spanish-language mystery where players had to work together to solve a local murder. Set in a Spanish-speaking neighborhood in Albuquerque, NM, the game played as a historical novel in which learners had to master Spanish requests and apologies to solve a fictional murder in a real neighborhood. This resulted in meaningful interaction (in Spanish) with simulated characters, other players, and local citizens. Participation in the game asked learners to discover clues by interacting with a wide variety of characters to uncover clues to the murder. Framed as potential suspects along with the other families, the better their requests, the more they were able to prove their family was not part of the murder. Research from this project offers a number of key insights into place-based language learning:

- Place is key to the creation of meaningful “fictional” stories and [orienting learners away from grammatical forms towards functions] (Holden & Sykes, 2012)
- Mobile technologies can facilitate (and possibly mediate) complex interactions in the community (Sykes & Holden, 2011)
- Feedback is critical across four dimensions: game, environmental, peer, instructional (Holden & Sykes, 2013)

A more recent endeavor, the *ChronoOps* AR project takes inspiration from Holden and Sykes (2011) to create a quest-based AR app where learners play the role of agents from the future. Set in Portland, OR, language learners are asked to come back from the year 2070 to save the environment by enhancing sustainability efforts around the community. Unlike *Mentira*, which follows a more linear, staged set of play experiences, *ChronoOps* is designed as a series of open-ended, and intentionally underspecified, tasks with the intention of having learners design their own experience while playing the role of agent. The game is available in English, French, German, Hungarian, Japanese, and Spanish. Findings from a set of microanalyses of video gameplay discourse indicate

a meaningful facilitative role of the place-based, augmented reality game *ChronoOps* for language learners. Key findings include:

- A visible role of the mobile device itself in player-player interactions (Thorne, 2015)
- A notable role of read-aloud text during gameplay (Hellermann et al., 2017)
- The incorporation of the physical surroundings as related to user speech (Thorne and Hellermann, 2017).

Findings from each of these two projects help frame the dimensions discussed later in the chapter, and offer a brief history of the work in this area. While other games have been built and used in classrooms, empirical examination of these experiences is still limited. Moreover, the phasing out of the ARIS platform has changed the nature of development for many who had already built experiences, creating the need to find new funds to move the experiences to new platforms and move on to additional projects. For further discussion of this trajectory as related to *Mentira*, see Holden et al. (2016).

### Critical Issues and Topics

In addition to the findings of the specific projects discussed previously, this section offers a synthesis of work in language learning, combined with other disciplines, to summarize critical issues for the design and implementation of place-based learning. Initially developed as a working document for practitioners looking to evaluate place-based experiences in language learning classrooms (CASLS, 2018<sup>1</sup>), this section synthesizes previous research and draws on relevant implementation related to five key issues to consider in place-based learning: (1) Interactivity, (2) Context, (3) Engagement, (4) Learning Features, and (5) Technological Affordances. This section outlines each dimension and summarizes relevant research.

#### *Interactivity*

Interactivity refers to the way users engage with one another (i.e., social interactivity), the environment (i.e., place interactivity), and the learning experience itself (i.e., experience interactivity). Work in this area attempts to understand ways in which various types of interactivity may, or may not, lead to learning when connected to place-based experiences. Here we examine each of the three types of interactivity especially relevant to the design and implementation of place-based language learning experiences (See Table 22.1 for a summary).

Social interactivity (i.e., the opportunity for social interaction and collaboration with co-learners and others) is key in the majority of place-based language learning experiences that target communicative competence (see Sykes et al., 2019). Successful interactive design creates “the conditions, or affordances, for interaction” and facilitates learner participation on interpersonal and cultural levels (Sykes & Reinhardt, 2013). This type of interactivity is largely implemented in learning experiences as learner interaction in situated discourse (i.e., discourse in realistic settings with people and places, possibly in augmented-reality scenarios), and in settings that require collaboration and interaction with other users, emphasizing 21st century skills (see National Center on Education and the Economy, 2007; Klopfer, 2008).

Place interactivity (i.e., with the physical or virtual location in which the gameplay experience takes place) plays a significant role in forming an impactful learning experience (Holden & Sykes, 2011; Thorne & Hellermann, 2017). Place is included as a component of interactivity to explicitly note the agentive nature place plays in these learning experiences. As players explore the world, interaction with place requires them to look up from their devices and use contextual clues from the world to experience the game. Moreover, as the place itself changes, so can the play experience. This can be designed into the experience in a variety of ways, but always with

Table 22.1 Interactivity and Place-based Learning

<i>Type</i>	<i>Characteristics</i>	<i>Relevant References</i>
<b>Social interactivity:</b> Interaction with people and place(s); collaboration between users and community members.	<ul style="list-style-type: none"> <li>• The experience encourages interaction with other people – other users, other learners, and community members.</li> <li>• The experience promotes meaningful discourse.</li> <li>• The experience requires collaboration between participants, virtually or in live action.</li> <li>• The experience requires communicative skills to negotiate meaning and fulfill tasks, such as persuasive speaking and negotiating.</li> <li>• The experience requires the ability to communicate ideas to various audiences, using the appropriate language registers.</li> </ul>	Dunleavy et al, 2009; Gee, 2007; Holden & Sykes, 2013; Kirriemuir & McFarlane, 2004; Klopfer, 2008; Liu & Tsai, 2012; National Center on Education and the Economy, 2007; Parsons et al., 2012; Perry, 2014; Salen & Zimmerman, 2004; Thorne & Hellerman, 2017
<b>Place Interactivity:</b> Interaction with the physical or virtual location in which the experience takes place.	<ul style="list-style-type: none"> <li>• The experience engages the users with the place in which the experience takes place.</li> <li>• Understanding the place impacts the outcomes of the game.</li> </ul>	
<b>Game Interactivity:</b> Interaction with mechanisms (i.e., selecting options, achieving goals, gameplay within the experience itself).	<ul style="list-style-type: none"> <li>• The game involves in-activity choices and encourages decision making by the user.</li> <li>• The user's decisions impact the outcome of the game.</li> <li>• The game engages users visually, auditorily, and tactually.</li> </ul>	

an eye toward interaction with the physical location during the play experience. In this way, when designing place-based experiences, the place becomes agentive through the use of in-game assets (e.g., find the missing item), locative behaviors (search for the historical building), or other players (e.g., find another group who has a specific item). This place interactivity is present in the other design dimensions discussed below.

Finally, game interactivity (i.e., interaction with game mechanisms themselves), is a dimension that determines the level of learner engagement and can vary based on each learner's preferences. Gameplay mechanics that require actions and decision-making by the player have been shown to increase the level of explicit interactivity through actively involving the player in advancing the gameplay (Salen & Zimmerman, 2004). As a result, the level of learner engagement is raised (see Engagement below), which describes the immersive devices employed by a language learning experience to capture the user's attention and imagination (Salen & Zimmerman, 2004; Sykes & Reinhardt, 2013). These immersive devices include visual, auditory, and tactile interactions, and/or strong and engaging narratives. Experiences that involve characteristics such as engaging game scenarios allow players to interact with, or even influence, these devices further, offering opportunities for learner involvement and ownership.

**Context**

In addition to considerations related to interactivity, it is essential to consider place-based language learning experiences in relation to the physical and social contexts in which they occur; both physically and virtually. This heightened attention to context is a fundamental dimension of place-based language learning and a noteworthy affordance of experience design and implementation. Key considerations include 1) a real world connection, 2) involvement with the community, 3) opportunities for functional language use, and 4) physical proximity (See Table 22.2). Each is synthesized separately as a means of discussing various dimensions of context; however, in many instances, the categories overlap (e.g., often real-world experiences are directly connected with the communities in which they exist). Not intended as a checklist, but rather a synthesis of possible approaches, the applicability of each depends on the specific place-based experiences being designed.

A distinct real world connection, including opportunities for contextualized language use in interaction with real places and people, as well as participation in the target community, is regarded as an essential element in target language acquisition and the development of translingual and

Table 22.2 Context and Place-based Learning

Type	Characteristics	Relevant References
Real-world connection	<ul style="list-style-type: none"> <li>The learning experience builds a connection to real-world experiences and is clearly “situated” in a physical place or immersive context.</li> <li>The learning experience raises awareness of a place and its issues, as well as people, events, time, and artifacts.</li> </ul>	Driver, 2012; Dunleavy et al, 2009; Godwin-Jones, 2016; Holden & Sykes, 2011; Klopfer, 2008; National Standards in Foreign Language Education Project, 1996; Reinhardt, 2016; Sykes & Holden, 2011;
Involvement with target community, culture, social practices	<ul style="list-style-type: none"> <li>The learning experience is clearly “situated” in a cultural context.</li> <li>The experience raises pragmatic awareness, and the learner’s ability to use language as part of a community.</li> <li>The experience enables the learner to participate in social practices and meaningful interaction.</li> </ul>	Lave & Wenger, 1991; Klopfer, 2008; Dunleavy et al. 2009; Smith & Sobel, 2010; Sykes & Holden, 2011; Sykes & Holden, 2011; Driver, 2012; Godwin-Jones, 2016; Reinhardt, 2016
Functional language use	<ul style="list-style-type: none"> <li>The experience is centered around authentic (i.e., realistic) discourse within the target community.</li> <li>The experience emphasizes relevant language functions for everyday interaction within the target community (such as requesting, apologizing).</li> </ul>	Holden & Sykes, 2011
Physical proximity	<ul style="list-style-type: none"> <li>The experience requires onsite engagement (i.e., parts of the activity require being at an actual physical location).</li> <li>The experience’s narrative is set in a physical location, but the place is mediated virtually and can be engaged with remotely.</li> </ul>	Sykes & Holden, 2011

transcultural speakers (Driver, 2012; Dunleavy et al., 2009; Reinhardt, 2016). Place-based learning experiences offer a distinct opportunity to create these experiences for learners, while also remediating their experience with place and context to enhance and augment that experience.

Furthermore, an emphasis on context goes hand-in-hand with functional approaches to language learning that stress the communicative functions of language and the importance of pragmatics and meaning-based language learning (see Saville-Troike, 2006). Through involvement with the target culture and social practices, and real-life or virtual interaction with local communities in authentic discourse situations, relevant language functions (such as greeting, requesting, apologizing) and appropriate speech behavior are modelled, a fundamental factor in raising linguistic and intercultural awareness and competence (Sykes & Holden, 2011).

Varying in proximity and degree of augmentation, place-based learning experiences can employ numerous methods to evoke a place and its cultural context. The most researched contexts are on site experiences which take place in physical locations and employ the dimensions of interactivity and context discussed above. This enables players to engage with the physical location and the people present, using augmentation by mobile technology to facilitate that engagement. In addition, programs can evoke remote place-based engagement through, for example, the virtual exploration of real places (e.g., a virtual reality tour of a closed museum or a city in a remote part of South America) or an overlay of a historic place in close physical settings (e.g., a map of a historical city explored via walking around a college campus). Place itself is at the heart of the experience, with the game offering context and mediating that experience. It remains to be investigated if remote experiences employing the same place-based behaviors achieve an equivalent pedagogical effect and promote intercultural insight on an equal level as on-site experiences.

### *Engagement*

Research on place-based language learning frequently notes the vast potential for high levels of learner engagement. Extending to areas and topics beyond the physical walls of the classroom, these place-based language learning experiences can involve learner interests and goals, as well as target topics that are personally relevant to specific learner groups. This effect is amplified if the experience engages learners in locations directly connected to their lived experience and place (Klopfer, 2008; Klopfer & Squire, 2010; Malone, 1980; Sykes & Holden, 2011).

If learners are able to connect their language study to their experience, it is expected they will engage in tasks and activities with an intrinsic interest in the learning outcomes, particularly when these experiences directly relate to learners' own lived realities and enable exploration of their local community (see section on additional contributions for examples of work in this area). Well-designed language learning activities encourage learner autonomy by allowing for open-ended exploration of the interactive space as a place that does not simply transmit knowledge, but builds it (Scardamalia & Bereiter, 2006). The most successful and enjoyable learning experiences are characterized as activities that involve learners in the creative process by making decisions that impact and advance gameplay in concrete and tangible ways, and allow learners to personalize their learning experience with regards to their interests and needs, challenge, and skill level (Dede, 2005; Malone, 1980; Squire, 2009; Sykes & Holden, 2011).

Moreover, when learners serve as designers of their own experiences, they take ownership of the learning and are afforded the opportunity to offer others exploration of the places most relevant to their lived experience. This might be exploration of one's home community to enhance connection for heritage learners, the design of a tour to engage others in a set of food carts especially relevant to a students' family or social circle, or a game to capture graffiti from around a city before it is cleaned up or painted over. Whatever the topic, placing the ownership in the hands of the learner facilitates agency and empowers community exploration.

Table 22.3 Engagement and Place-based Learning

Type	Characteristics	Relevant References
Connection to learners' lived reality	<ul style="list-style-type: none"> <li>The experience has intrinsic value and personal relevance, targeting interests and goals of a specific learner group.</li> <li>The experience provides tasks that activate the learner's background knowledge and stimulate engagement.</li> </ul>	Malone, 1980; Klopfer, 2008; Dunleavy et al., 2009; Holden & Sykes, 2013
Ownership and personalization	<ul style="list-style-type: none"> <li>Working with undefined goals and outcomes and open-ended exploration of the interactive space, the learning experience promotes learner autonomy and decision-making that impacts and advances the gameplay in meaningful ways.</li> <li>By involving learners in the creative process, the learning experience encourages learners to take ownership of their learning path and goals.</li> <li>Learners become designers themselves by creating new ways to engage with the place or the experience.</li> </ul>	Malone, 1980; Kirriermuir & McFarlane, 2004; Dede, 2005; Gee, 2007; Klopfer, 2008; Mathews, 2010; Sykes & Holden, 2011; Liu & Tsai, 2012; Richardson, 2016
Feedback and opportunities for reflection	<ul style="list-style-type: none"> <li>The learning experience communicates clearly defined performance criteria, and feedback is provided throughout (electronically, by exchange with other players, or by physical reality).</li> <li>The activity offers opportunities for the learner to reflect on their learning progress and readjust focus and goals.</li> <li>The learning experience is scaffolded and supports progressive understanding (progressivity).</li> </ul>	Sykes & Holden 2011 Malone, 1980; Kirriermuir & McFarlane, 2004; Dede, 2005; Gee, 2008; Klopfer, 2008

### Learning Features

Place-based experiences that employ interactive elements provide experiences in which users are given the opportunity to develop complex communicative skills actively, by negotiating or arguing in favor of ideas, or passively, by observing third party interactions within the experience. Moreover, well-designed experiences often incorporate a variety of realistic resources, such as historical documents, scientific evidence, or historical media, audio, and video recordings (Squire, 2009). In order to succeed in the learning experience, users often need to collect and analyze these and other types of data and resources (e.g., information, equipment, tools), and organize them for later use in specific contexts, thus facilitating transfer of skills or knowledge from a familiar domain to an unfamiliar one (Bransford et al., 2000). This reapplication of previous knowledge and acquired concepts in new contexts, as well as inductive and deductive reasoning, economizes the learning process and furthers learners' insights and understanding of these concepts. See Table 22.4 for a summary.

In addition, many place-based language learning experiences involve open, exploratory activities that require strategic thinking (e.g., scavenger hunts), sometimes sustained over multiple days, in order to successfully participate. A useful exemplar is *Ecopod: Survival* (<https://casls.uoregon.edu/student-programs/residential-immersion/>), a place-based, augmented reality game in which students navigate their immediate surroundings and collaborate on collecting and selecting proper resources to survive a pandemic. Games such as this can engage users in non-linear



Table 22.4 Learning Features and Place-based Learning

<i>Aspects</i>	<i>Characteristics</i>	<i>References</i>
Manage complex data and abstract concepts	<ul style="list-style-type: none"> <li>• The learning experience requires the learner to collect, organize, and analyze complex data.</li> <li>• The learning experience requires managing a variety of resources, such as data or material resources.</li> <li>• The learning experience requires learners to work with abstract concepts.</li> </ul>	Kirriermuir & McFarlane, 2004; Dede, 2005; National Center on Education and the Economy, 2007; Klopfer, 2008
Inductive/deductive reasoning and transfer	<ul style="list-style-type: none"> <li>• The learning experience relies on the transfer of skills and knowledge from a familiar domain to an unfamiliar one.</li> <li>• The learning experience requires learners to apply data or resources in a new context</li> <li>• The learning experience fosters inductive and deductive reasoning.</li> </ul>	Bransford, Brown & Cocking, 2000; Kirriermuir & McFarlane, 2004; Gee, 2007; National Center on Education and the Economy, 2007
Innovative, sustained problem-solving and strategic thinking	<ul style="list-style-type: none"> <li>• The learning experience requires creativity and innovative thinking to solve problems.</li> <li>• The learning experience requires continued (possibly multi-day) problem-solving.</li> <li>• The learning experience requires non-linear problem-solving.</li> <li>• The learning experience requires planning and risk assessment.</li> <li>• The learning experience requires the learner to adapt to changing tasks, goals, and demands (adaptability).</li> </ul>	Kirriermuir & McFarlane, 2004; Gee, 2007; National Center on Education and the Economy, 2007; Thorne, 2015; Thorne & Hellerman, 2017

and innovative problem-solving, prompt them to plan their actions and reactions, and assess risks in order to navigate through the experience (Kirriermuir & McFarlane, 2004; Reinhardt, 2019). This problem-solving/strategic thinking component is essential in that it orients learners to new ways of using existing resources in their environment. As such, objects and locations take on new significance and require attention in previously unconsidered ways. In doing so, users are continually prompted to adapt to changing tasks, goals, and demands, again stimulating transfer of skills and knowledge.

### ***Technological Affordances***

Finally, as can be seen in Table 22.5, place-based experiences draw on key technological affordances of mobile devices to employ the complex learning behaviors described previously. Most relevant are the on-the-go digital mediation, consistent accessibility of language content for learning, review and reflection, and multimodal resources for problem solving and interaction.

As a design principle, mobility influences the structure of many language learning applications. While technological applications enhance the language learning process in general by providing opportunities to review and recall language content, place- and experience-based language learning experiences add elements that allow for on-site engagement and augmented reality use. In mobile place-based learning scenarios, a direct connection to the learner’s environment, their local and social

Table 22.5 Technological Affordances of Mobile Devices for Place-based Learning

Aspects	Characteristics	References
Mobility	<ul style="list-style-type: none"> <li>• The learning experience is mobile, using portable equipment, most often smartphones or tablets.</li> <li>• The learning experience affords ubiquitous engagement and can connect users to a common network or a shared environment.</li> </ul>	Chinnery, 2006; Dede, 2005; Dunleavy et al, 2009; Gee, 2007; Johnson et al., 2010; Klopfer & Squire, 2008; Squire, 2009; Sykes & Holden, 2011; National Center on Education and the Economy, 2007; Prensky, 2007
Accessibility of language content	<ul style="list-style-type: none"> <li>• Language content is accessible throughout the activity and can be reviewed throughout the learning experience (e.g., conversation logs, vocabulary lists, inventory lists, written narratives, task descriptions).</li> <li>• The activity requires review and recall of important and/or new concepts.</li> </ul>	
Multimodal	<ul style="list-style-type: none"> <li>• The learning experience functionally employs various means of technology and media in problem-solving (e.g., peer-to-peer messaging, wireless communication, spatial navigation).</li> </ul>	

context, adds meaning and relevancy to their learning experience (see Context and Engagement above). Place-based language experiences naturally lend themselves to advancing digital media literacy, an important 21st century skill. Within many place-based learning experiences, a multimodal approach is functionally applied in problem-solving throughout the activity (e.g., peer-to-peer messaging, wireless communication, spatial navigation, embedded external content) as a means, rather than the end, of realizing the exercise.

### Current Contributions and Research

In addition to the projects highlighted in earlier, place-based language learning has also been utilized in native language revitalization and teaching to connect learners to the places in which language can be accessed and documented. This work draws on the dimensions above, and, in most cases, utilizes local community members as the designers of the games themselves. Co-creation of experiences with community members helps ensure remediation with place is meaningful and relevant and employs narratives appropriate for the place being explored.

Jansen et al. (2013) offer an analysis of ways in which a place-based curriculum, implemented in various communities in Oregon and Washington, contribute to their *Identity through Learning* framework. Sample curricular materials include a Grand Ronde Basketry and Tamañksh (medicinal uses of plants and food) in the Yakama language. While not reflective of the technological infrastructure of many of the projects discussed here, these curricular components connect learners with a deep sense of place as tied to their related language and practice. Current efforts are underway to consider ways of implementing place-based, augmented reality in these, and other language leaning contexts of the Pacific Northwest. Digital tools have also been shown to be effective tools for facilitating place-based language learning in community language contexts. In the context of a larger project related to Yup'ik language revitalization, Siekmann et al. (2013) explore the use

of place-based augmented reality for community-responsive language and cultural exploration and learning, highlighting the critical element of the community in this work and describing a place-based game designed by members of the community to facilitate storytelling and language use. Both projects are key examples of current work in the area of place-based language learning for language revitalization.

### Research Methods

The majority of research in the area of digital place-based learning employs one of two approaches: (1) a mixed-method approach to analyze user behavior during gameplay as well as abilities and perceptions before and after the experience, or (2) a microanalytic approach to player discourse and learning products as a result of gameplay.

Data collection in both instances involves the use of a backend database to record learners' responses as they play, recording devices (audio and video) worn as head-mounted cameras (*GoPros*) or wearable audio recording devices, and surveys and interviews conducted by the research team. The advantage of these approaches is a better understanding of the gameplay process, physical exploration patterns, and learner discourses. Analysis might include, for example, the language (i.e., L1, L2, or both) used for different in-game functions (Kato et al., 2019), player patterns as they related to pre/post results of learning (e.g., pragmatics, vocabulary learning, functions), or identification of specific gameplay points that trigger peer-to-peer or peer-to-game interaction.

Analysis approaches have varied with some research teams using the gameplay data and survey data to answer research questions related to specific features or learning targets such as the pragmatic function of requests or type of feedback given (e.g., Holden & Sykes, 2013) and others have focused on a discursive analysis of the gameplay experiences itself to catalog and describe learning encounters during gameplay (e.g., Thorne & Hellerman, 2017). In all cases, work in this area has examined both the process and the product of the implementation of place-based learning.

### Recommendations for Practice

Despite the educational potential of immersive place and experience-based language learning experiences, digital place-based language learning is not regularly integrated in the language learning classroom (Dunleavy et al., 2009; Kirriemuir & McFarlane, 2004; Klopfer, 2008). Common challenges to this implementation include a lack of institutional technological infrastructure (access to mobile devices, bandwidth issues), time and cost constraints for design and development, cost of implementation, and issues related to privacy and control.

However, despite these challenges, implementation of place-based learning in the language learning classroom is possible. Take, for example, place-based experiences like *Mentira*, *ChronoOps*, *Ecopod: Survival*, or *Paris Occupé*, all of which have been successfully integrated into language courses and used over multiple years and in multiple sections. Drawing on principles from the New London Group's (1996) pedagogical model for multiliteracies as well as Thorne and Reinhardt's (2008) more recent proposal of *bridging activities*, Sykes et al. (2019), offer a summary of ways to use place-based learning to enhance understanding and exploration of communities by language learners. They offer insight into task design considerations and assessment and evaluation of learning outcomes. In doing so, the authors suggest task design which facilitates observation as part of the place-based experience, offer opportunities for guided analysis of what is observed, and community participation whenever possible. In terms of evaluation, they offer sample rubrics and evaluation ideas for assessing learners' own self-reflection, participation in the experience, and awareness of the community in which learners find themselves.

Another key barrier to implementation can be the time and energy it takes to create a new place-based experience for language learners among the numerous other needs in a language classroom. Place- and Experience-based Language Learning (PEBLL) <http://pebll.uoregon.edu> is a database that aims to facilitate the review process and support teachers in finding programs and services for adaptation in their language classrooms. Drawing on the critical dimensions explored previously, PEBLL is a curated database that compiles place- and experience-based language learning experiences, tagged and categorized by indicators such as language, proficiency level, and content area. It provides easy access to high-quality language learning projects from all over the world. In addition to the search and filter options, the database also enables practitioners to search by key dimension (see Critical Issues and Topics).

In many instances, mobile and place-based language learning experiences are still regarded as optional elements in the language classroom; however, their benefit in enhancing language studies might promote their increased adaptation in the future. This is especially true in light of drastic changes taking place in the educational arena. In Spring of 2020, the rapid shift to online, hybrid, and hy-flex (i.e., simultaneous instruction to students in a physical classroom and online) learning created conditions that both limited and augmented the opportunities for digital place-based learning. While implications of these drastic shifts will be felt for decades to come, place-based language learning can offer a means for exploration of one's local neighborhoods while still collaborating with classmates and finding target language experiences out in the world. In addition, when implemented with place at the core, these experiences can also offer a means to virtually explore inaccessible places through 360 video or VR engagement. It should be noted that this is distinct from virtual gameplay in fictional worlds or virtual spaces. Instead, place-based approaches can deploy VR technologies to simulate physical exploration (a technological capability which has developed rapidly as a result of the global events of 2019–2021).

### **Future Directions**

The future of place-based learning is yet to be determined and will, undoubtedly, shift drastically as people reimagine their own spaces and places in which they live due to the global pandemic. Digital place-based learning is an embodied experience which intentionally facilitates exploration of physical environments and their associated communities while simultaneously using digital resources to enhance that experience. Critical to the future of digital place-based learning is the deployment of a robust research program examining how place-based learning can further facilitate language learning in both physical and virtual places. Some key considerations for the future include:

- 1 Empirical investigation of the synthesized dimensions related to interactivity, context, engagement, learning features, and technological affordances. This research should occur in a variety of learning contexts, including K-12 classrooms, non-institutional learning contexts, and heritage language programs. Thus far, the vast majority of research studies have been conducted in college classrooms at four-year institutions. Extending these research contexts is fundamental to a more comprehensive understanding of place-based learning as it can be applied across contexts.
- 2 A comparison of place-based language learning experiences that are virtual to those explored here which, in most cases, are a digitally-mediated physical experience. The use of VR for place-based learning offers notable potential for exploration when learners are not able to engage in significant physical exploration. At the same time, this approach is missing some of the key dimensions highlighted earlier (i.e., engagement with members of the community in that place). Relatedly, research on mixed reality experiences that draw on the affordances

of both digitally-mediated physical and VR experiences should be investigated as a means to connect the two and increase awareness around the specific design and implementation features necessary for meaningful experiences.

- 3 A comparison of the experiences currently possible with emergent enhanced augmented reality capabilities that will likely enable the creation of a new type of immersive experience, in which resources available to learners become increasingly rich. Research around the design and implementation of these features will be key to determining what works and what does not work across a variety of implementation contexts. An empirical approach to implementing these, and any, emergent features is essential to ensure they enhance learning prior to wide-spread deployment.
- 4 Research addressing the role artificial intelligence and wearables can play in place-based language learning experiences has not yet, at the time of this writing, been investigated as related to place-based language learning. Possible applications of this technology include the use of wearables to trigger experiences in the physical space (e.g., a guide which appears when a learner reaches a marker and triggers the device), a system for collecting data about what learners do out in the world, thus limiting the user-error in reporting or recording those experiences, or a multi-dimensional experience with place that changes how each individual may experience the same physical location.

Place-based learning offers significant advantages to language teachers and learners for community exploration, meaningful peer-to-peer collaboration, and the embodiment of the learning experience. As our understanding of place continues to change, and as new technological tools become available, we have an opportunity to deepen our understanding of the physical spaces in which we find ourselves while also developing the language skills necessary to connect with people in those spaces. One of the participants of the *Mentira* project says it best,

*Going somewhere else, having somewhere actually ... at a place set in around Los Griegos ... was a difference, it was a breath of fresh air, and I enjoyed it ... immensely.*

Sykes, Knight, and Holden, 2019, R1, lines 53–56, Fall 2009

### Note

- 1 This project was part of a larger research project funded by Title VI Language Resource Funding at the U.S. Department of Education under grant #P229A140004. Contents do not necessarily represent the policy of the U.S. Department of Education nor imply endorsement by the federal government. Key contributors on the CASLS research team include Kathrin Kaiser and Stephanie Knight.

### Further Reading

Godwin-Jones, R. (2016). Augmented reality and language learning: From annotated vocabulary to place-based mobile games. *Language Learning & Technology*, 20(3), 9–19.

In this review, Godwin-Jones offers an overview of the use of augmented reality technologies as applied to language learning. This includes a look at a variety of platforms and projects directly related to marker-based AR (e.g., *LearnAR*), place-based AR experiences and games (e.g., *Project Tango*, *Imparapp*, *Mentira*), and various AR tools (e.g., *ARIS*). In addition, the author explores practical implementation ideas and offers a look towards the future.

Squire, K. D. (2009). Mobile media learning: multiplicities of place. *Horizon*, 17(1), 70–80.

In this article, Squire explores the notion of place as related to learning as well as the multiplicity of affordances offered via mobile exploration. Using examples from various educational arenas, Squire offers insight into ways designers, educators, and learners can consider space and mobile exploration.

Thorne, S. L. (2015). Mediated life activity, double stimulation, and the question of agency. *Learning, Culture and Social Interaction*, 4, 62–66.

Thorne offers a theoretical exploration of the notion of agency and explores the fundamental question—How is individual and distributed human agency constituted and what are its limits and potentials? In this exploration, he offers insight into the notion of double simulation in educational contexts and in the world as a means of considering agency. This insightful introduction offers an important insight for those wishing to further explore learners' agency and ownership as part of place-based experience design.

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