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REVIEW OF RECENT SCHOLARSHIP

Digital games and gaming in language learning and teaching

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Abstract

As digital or video gaming has grown in popularity around the globe in the last few decades, attention to its potential as a means to learn L2s (second, foreign, or additional languages) has grown, as evidenced by an increase in academic journal-based treatment of research in DGBELLT (digital game-based and enhanced second/foreign language learning and teaching), alongside monographs and edited volumes. To identify common findings and research trends, we conducted a review of recent research and scholarship in the young field published between January 2021 and December 2024 inclusive in major academic journals and edited volumes. We ultimately selected 76 pieces for the review, categorizing them into five types or foci: reviews and meta-analyses, studies of game-enhanced L2 learning and L2 gaming, game-enhanced pedagogy, L2 learning game design and development, and teacher education. After synthesizing the pieces in each category, we offer concise take-aways and discussion, implicating gaps, needs, and future directions.

Keywords: digital game-based language learning; digital game-enhanced language teaching; gameful language learning; language teacher education

1. Introduction

People have always used games to play, socialize, and learn informally and formally, and teachers have always used games and play as a means to motivate, reward, and teach. However, in the past 50 years digital gaming has boomed with the computer and internet revolutions, leading to renewed teaching and research practices. Globally, the digital game industry is now larger than the film and music industries combined; valued at USD 12.2 billion in 2024, the educational gaming sector alone is projected to reach USD 21.6 billion by 2031.[1] Scholars have gone so far as to argue that the growth in digital gaming has had such a notable impact on how young people learn (Prensky, 2001) and develop literacies (Gee, 2007) that we should incorporate digital games and gameful (Reinhardt, 2019) – game-related and inspired – approaches into language teaching practice. The number of teachers interested in, and available resources for, doing so is increasing rapidly, alongside journal articles, monographs (e.g. Peterson, 2013; Reinhardt, 2019; Sykes & Reinhardt, 2012), and edited volumes (e.g. Peterson & Jabbari, 2022; Peterson et al., 2021; Reinders, 2012) that illustrate an increasing diversity of approaches to research, development, theories, methodologies, and contexts of application.

While it can be presumed that games have always been used for language teaching and learning, DIGITAL games, that is, videogames, were identified as having potential as early as the 1980s.

Attention at the time focused on how these interactive forms of entertainment could serve as motivating, interactive learning environments, leading to treatment of them as texts, tutors, or tools for in-person collaboration (Reinhardt, 2017), just as analog (i.e. non-digital) games were understood. However, attention transformed with the growth of the internet and broadband in the early 2000s, which allowed for remote, transglobal multiplayer digital gaming (Reinhardt & Kirby, 2022) and the potential for learners to interact with other players in real time, learning through social collaboration in the game and around the game in gaming communities (Thorne, 2008). Aligning with the social turn in second language acquisition (SLA), studies focused on the possibilities of using games[2] not only for learning understood through structural and cognitive perspectives but also socio-collaborative or ecological (Sykes & Reinhardt, 2012). Most recently, online gaming – playing with others in real time thanks to broadband – has become possible and popular, giving rise to new game genres and designs.

The field of games and gaming in second language teaching and learning (L2TL) is now at something of a coming-of-age point, as a critical mass of interested and active researchers and practitioners commit to it as a field worthy of their primary interest. However, the practice faces several challenges, for example, skepticism in schools and in society more generally about using games for serious learning, a lack of attention to teacher education and implementational issues, and a dearth of effective, commercially available educational or serious games for L2TL. These challenges are compounded by the fact that the field does not have a single disciplinary home, meaning that scholars, journals, and conferences are widely dispersed, scattered throughout fields like computer-assisted language learning (CALL), applied linguistics, education, computer science, information science, game studies, and game design. This dispersion might also explain the lack of an agreed upon name for the field, although the term DGBLL (digital game-based language learning) is becoming most accepted. In this paper we use 'DGBELLT', adding an 'E' for enhanced and a 'T' for teaching, following the convention the first author of this review suggested with Sykes (Sykes & Reinhardt, 2012) and in his monograph (Reinhardt, 2019). This makes a distinction between 'game-based' and 'game-enhanced' to distinguish the study of games purposefully designed for teaching and learning (based) from the educational use or adaptation of those designed for entertainment (enhanced).

The review omits the category 'game-informed', which Sykes and Reinhardt proposed to include the concept of 'gamification' and distinguish it from the use of games, since gamification is the application of game design elements to activities not usually considered games, like shopping, exercising, or working. While its exact definition has been debated endlessly, 'game' is generally understood as a rule-based, narrative-framed, playful experience with a measurable end state (see Reinhardt, 2019, ch. 3). The distinction between a game and gamification that the latter does not include enough of the defining qualities of a game, for example a narrative pretense, to be considered a game. Since we intended for this to be a review of DGBELLT and were limited by space, we did not include research that called their learning activities 'gamification', although we included studies that called their learning activities 'games' even if they might be gamification by some definitions (see section 5 for further discussion).

1.1. Methodology

To frame these and other challenges, this review of recent scholarship on DGBELLT seeks to present the current state of the field, focusing on recent trends and findings to implicate future directions. For the review we conducted a survey of recent literature by gathering, reading, and categorizing articles, theses, and chapters on the topic using a grounded approach (Glaser & Strauss, 1967; Glaser, 1992) that considered similarities and differences among research designs, contexts, and findings. We limited our search to the last five years at the time of writing, between the start of 2020 and end of 2024, as this was meant to be a review of recent scholarship and capture recent trends. A search of ERIC, ProQuest, ScienceDirect, and EBSCOHost using combinations of the

phrases 'game-based language learning', 'game-enhanced language learning', 'second language acquisition', 'foreign language acquisition', 'language learning', 'commercial video games', 'digital games', 'serious video games', and 'educational video games' resulted in over 500 candidate studies. We also scanned the contents of the journals *Language Learning and Technology, ReCALL Journa*l, *Computer-Assisted Language Learning*, and *CALICO Journal* over those same years. Finally, to make sure we had not missed important publications we also identified recent monographs and edited volumes in the field and used Google Scholar to search for recent candidate work that cited these publications.

We started by eliminating publications that did not have clear focus on both digital gaming and second language (L2) learning or teaching, leaving us with approximately 150. To capture recency and to keep our analysis manageable, we decided to eliminate those published in 2020, leaving us with about 120 published in the four years from 2021 to 2024 (from January 2021 to December 2024 inclusive). Following a Glaserian grounded approach (Glaser & Strauss, 1967; Glaser, 1992), we used emergent coding, constant comparison, theoretical sampling, and memo writing to develop categories inductively. While we had our own (Sykes & Reinhardt, 2012; Reinhardt, 2019) framework in mind, this approach allowed us to avoid pre-defined analytic categories as much as possible. Emergent codes included phrases like 'game-enhanced', 'informal L2 gaming', 'gamification', 'vocabulary', 'game design', and 'teacher training', leading to five categories (see below), each with at least five publications, enough from which to synthesize observations on recent trends. Finally, we decided that because of space limitations we could not include pieces on gamification, and so from these 120 we chose 76 that were clearly focused on DGBELLT, eliminating publications that self-identified as gamification rather than game. This second-stage selection involved a collaborative full-text review by both authors to confirm topical alignment and sufficient methodological description, with any disagreements resolved through discussion and memo comparison.

The five types of studies were the following:

Recent reviews and research syntheses (section 2)
From 2021 to 2024, 13 notable reviews, syntheses, and meta-analyses of the field have appeared that, considered together, point towards common trends and issues.

Game-enhanced L2 learning and L2 gaming (section 3)
Thirteen publications were identified that found evidence of L2 learning in commercial entertainment gameplay and gaming practices by means of a variety of methods and research designs, including discourse analysis of gameplay transcripts, large scale surveys, case studies, and corpus analysis.

Game-enhanced pedagogy (section 4)
Thirteen publications were identified that describe formal L2 pedagogical interventions using various instructional designs and models with commercial entertainment or educational games.

L2 learning game design and development (section 5)
Thirty publications of recent research were identified that describe the design and development and experimental implementation of custom L2 learning game-based experiences for a given learner population.

Teacher education (section 6)
Seven publications were identified that recounted interventions involving L2 teachers and DGBELLT, including surveys, case studies, and descriptions of teacher training courses and units.

2. Recent reviews and research syntheses

Thirteen reviews, research syntheses, and meta-analyses were identified that were published in the years from 2021 to 2024. Foci included the use of game creation tools, mobile-based games,

simulation games, games for K–12, game design elements, studies of vocabulary learning, and a survey of games as resources for cultural heritage education. Table 1 outlines the data types, findings, and major recommendation of the 15 pieces.

2.1. Discussion

All of the reviews found that DGBELLT has led to positive learning and motivational outcomes, but a few studies had a rather low number, and only one review (Dixon et al., 2022) was a meta-analysis that attempted to show statistical significance among findings. It may be there are not enough studies with similar designs that are comparable – basically the replication problem that is found across CALL, language teaching, and applied linguistics (Plonsky, 2015). At the same time, the number and diversity of the foci of the reviews is encouraging, showing that enough researchers and publishers have confidence that the field is legitimate and worth reviewing and synthesizing. The recommendations of the reviews are also helpful for future researchers, showing key gaps. Some (e.g. Huang & Schmidt, 2022) also showed that methodologies and theoretical frameworks were underdeveloped and underutilized, and that teacher involvement has been underexamined (deHaan, 2022; see also section 6.1 for discussion of this issue). Recommendations were made primarily for research and L2 learning game design, with notably fewer explicit recommendations for pedagogical practice. This gap may reflect the limited focus on explicit teaching methods or instructional integration of games within reviewed studies. (i.e. the T of DGBELLT; see section 4).

Of the challenges noted, the most common was that vocabulary has received perhaps too much attention while other skills and language areas received too little; this is perhaps because vocabulary is discretely measurable, clearly embeddable in game designs and content, and easily related to L2 learning dynamics and learner affect through pre- and post-testing. However, this predominant emphasis on vocabulary risks overshadowing deeper explorations into how acquisition interacts dynamically with learner emotions, motivation, and broader communicative competence. Future research should explicitly investigate these interactions to promote a more holistic understanding of language learning within digital gaming contexts. While studies of other skills areas like grammar, reading, and writing are less common, some game-enhanced pedagogy has begun exploring those skills (see section 4), which should open a door for reviews of research in those areas. Finally, there is a need for reviews that examine specific vocabulary mechanics, defined here as game features or interactions specifically intended to promote vocabulary acquisition through gameplay. These can include explicit vocabulary tasks common in educational games (e.g. matching puzzles, labeling activities), as well as implicit vocabulary supports frequently present in commercial games (e.g. repeated dialogue prompts, quests instructions, item descriptions). Future reviews should explore game types and genres beyond massively multiplayer online role playing games (MMORPGs) and simulation. Specifying these vocabulary mechanics can help researchers and practitioners better understand how various game features, across both educational and entertainment-oriented contexts, effectively support vocabulary acquisition.

3. Game-enhanced L2 learning and L2 gaming

While digital games have had a niche spot in L2 educational practice since their emergence in the 1970s, it was not really until the mid 2000s, when Gee (2007) noted the literacy practices inherent to digital gameplay and developments in broadband allowed for games that could be played online in real time with others – in particular, massively multiplayer online role playing games (MMORPGs), that new attention in CALL turned towards research and practice (e.g. Peterson, 2012; Thorne, 2008), giving rise to the field of DGBELLT. This research, the descriptive backbone of the field, includes examinations of L2 gaming 'in the wild', that is, the informal, extramural use of games in an L2 whereby the L2 is learned incidentally, a globally widespread and growing phenomenon; the term

Table 1. Reviews, syntheses, and analyses of DGBELLT (2021–2024)

Authors	Data and Focus	Findings	Major Recommendation
Berns and Ruiz-Rube (2022)	12 studies (2011–2021) reporting on use of game creation tools to develop L2 learning games	• Games built by teachers using tools like Scratch and App Inventor resulted in gains in vocabulary, writing, and creative skills • User-friendly game creation tools were generally underused	More teacher training in effective use of game creation tools
Camuñas-García et al. (2024)	100 entertainment and serious games as resources for cultural heritage education	• Most games succeeded in incorporating narrative-driven content and visual authenticity but lacked task-based learning and open-world exploration features • Games with identity-driven content and simulation elements fostered strong emotional engagement	Incorporate design features like interactive tasks and exploration tasks to promote immersion
deHaan (2022)	28 pieces on game-based language teaching (1998–2019), to expose gaps between theory and practice	• Many studies focused on learning outcomes but neglect practical teaching implications • Review shows inconsistent outcomes and lack of focus on scalable, classroom-level practices	More teacher-driven research and reports of curricular integration
Dixon et al. (2022)	Meta-analysis of 22 studies (2010–2019) for effects	• DGBELLT had moderate positive effects on vocabulary, grammar, and overall proficiency • Entertainment-based games were more effective than educational games, esp. with pedagogical mediation	Focus on skills other than vocabulary and on teacher roles in implementation
Govender and Arnedo-Moreno (2021)	Analyzes 114 studies to identify game design elements employed	• Feedback, narrative, and points were the most commonly used game elements, but other promising elements are underexplored • Vocabulary gains were the most common outcomes; comprehension and production are less studied	More research on less common skills and game elements
Hanghøj et al. (2022)	77 studies (2000–2020) on K–12 L1 and L2 DGBELLT	• L1 studies emphasized multimodal production and critical literacy, while L2 studies focus on vocabulary and grammar • Both L1 and L2 research reported positive outcomes, but methodologies varied widely	Bridge gaps between L1 and L2 research using interdisciplinary approaches
Huang and Schmidt (2022)	65 DGBELLT studies (2011–2020) for use of SLA theories	• Fewer than 1/3 of studies referred to theory, with most of those using sociocultural theory • Theory was used to ground design of serious games and for evaluation of entertainment games	More theory-driven game and pedagogical design

(*Continued*)

Table 1. (*Continued.*)

Authors	Data and Focus	Findings	Major Recommendation
Li et al. (2024)	205 DGBELLT studies (2000–2020) to identify research trends and themes	• Vocabulary learning and massively-multiplayer online role playing games (MMORPGs) have dominated research • Emerging technologies (virtual reality (VR), augmented reality (AR), and certain skills (grammar, writing) have been overlooked	More research on long-term effects and comparison between game types
Peterson (2021)	15 DGBELLT studies using simulation games (2005–2020)	• Simulation game-based and enhanced LL can support vocabulary learning and communicative skills • They can motivate learners and lessen anxiety during gameplay	More robust methodologies and longitudinal studies
Rasti-Behbahani (2021)	15 DGBELLT studies (1996–2020) focusing on vocabulary learning	• Games outperform traditional methods on vocabulary acquisition • Critical factors include motivation, repetition, feedback, authenticity, dual encoding, interactivity, and instantiation • Game designs should align with instructional strategies to maximize benefits	More studies of individual learner differences
Su et al. (2021)	64 studies on mobile-based language learning, including mobile game-based	• Mobile platforms were advantageous for portability, while non-mobile platforms excelled in immersion • Vocabulary gains and positive affective states were common outcomes	Combine mobile and non-mobile platforms to address diverse learning needs
Yang and Li (2024)	82 studies on DGBELLT using immersive games	• 'Contextualized' (immersive) DGEBLLT can lead to vocabulary gains and heightened motivation • Challenges include high cognitive load for learners and technical limitations on development	More studies that focus on grammar, listening, and learner variables; improve teacher scaffolding
Zou et al. (2021)	21 studies of DGBELLT (2008–2018) focusing on vocabulary learning	• DGBELLT can support significant short-term and long-term vocabulary gains • Challenges include cognitive overload, uneven game design quality, and limited focus on productive vocabulary knowledge	Better alignment between game designs and pedagogical goals

'L2 gaming' as used here broadly refers to playing a game in a second or foreign language, formally or informally, using and learning the L2 intentionally or incidentally (Reinhardt & Han, 2021). Like research on game-enhanced L2 pedagogy (section 4), this research involves published games that are usually commercial entertainment games but may also be educational; they are not, for example, an experimental game designed for research (see section 5). Methodologically, it may range from a descriptive case study to a close conversation analysis of a single game-based interaction to a large scale survey of informal L2 gaming habits. A typical research design has L2 learners play a game on their own without any pedagogical intervention, assessing learning with pre- and post-tests. It may also include analysis of gameplay interactions, sometimes with interpretation of the results informed by a particular SLA framework.

For the current review, 13 pieces of recent scholarship were noted for their focus on game-enhanced L2 learning and L2 gaming. Three types of this research are evident: a focus on particular mechanics and genres, a focus on L2 gaming as a social practice, and a focus on games as learning ecologies. MMORPGs continue to be a primary focus of the first type. For example, using an interactionism framework, Dixon and Christison (2021) recently examined ESL learner interactions playing the MMORPG 'Guild Wars 2', finding evidence that gameplay offered opportunities for modified output, form-focused feedback, and negotiation of input. They noted that many in-game tasks were structured similarly to classroom learning tasks that require cooperative problem-solving. Similarly, Jabbari and Eslami (2023) studied how gameplay offered ESL learner-players of 'World of Warcraft' (WoW – probably the most researched MMORPG) considerable opportunities for negotiation for meaning (NfM). They found that the game environment offered unique affordances for NfM that exhibited authenticity of the purpose of gameplay rather than NfM just for the sake of language learning, a prioritization of NfM during gameplay exigencies, brevity of those NfMs, and multilateral NfMs, that is, involving more than two interlocutors.

Recent research shows that other game mechanics besides those typical to MMORPGs offer affordances for interaction as well. For example, Hofmeyr (2021) examined NfM and interactional strategies in Japanese L2 English learners playing 'Keep Talking and Nobody Explodes' (KTNE), a cooperative puzzle game where players communicate to one other to complete joint tasks under time pressure. In just under four hours of gameplay Hofmeyr noted 52 NfM episodes. Similar mechanics have also been designed into 'Spaceteam ESL', a serious L2 learning game that requires players to communicate successfully with teammates across physical space under time pressure. Working with 61 Korean English as a foreign language (EFL) learners, Berry (2021) found that an experimental group had better listening comprehension outcomes after playing the game than a control group did, attributing the improvement to heightened flow states. Working with 58 Iranian EFL learners, Ahmed et al. (2022) found similar results with an experimental group compared to a control group vis-a-vis vocabulary scores, also finding heightened motivation and lowered anxiety. Implications are that developers of custom games (section 5) should consider designs that include uneven distribution of resources like MMORPGs and cooperative, time pressure mechanics that typify games like KTNE and Spaceteam ESL, and that these games have potential for game-enhanced pedagogy (section 4).

Finally, arguments have also been made recently that adventure games offer affordances for learning because of their narrative and immersive qualities. To illustrate, Lee (2023) showed positive vocabulary learning outcomes from 25 Korean learners of English playing the interactive film police procedural mystery game 'Her Story', noting that salience had more impact than frequency. She argued that design features like the multimedia nature of the presentation, intriguing narratives, and contextualized vocabulary uses where comprehension was required for progression contributed to the positive outcomes.

A second sort of research on game-based L2 learning examines the social practice of L2 gaming, with methods ranging from large scale surveys to individual case studies, among player-learners around the world. The practice is very widespread, especially in English as an L2, as gamers often want to play games not available in their L1 (Chik, 2014); the practice has also been associated with

improved academic performance (Sundqvist, 2019). Three recent studies using large-scale questionnaires are notable; two that confirm one another's findings and one that surveyed a rarely studied but key stakeholder in L2 gaming and DGBLL for children and their parents. Emre et al. (2022) surveyed 567 anonymous Turkish university students online about their L2 gaming habits, finding that over half communicated with other players in L2 English, and that most respondents felt the experience improved many different aspects of their English proficiency, including speaking through voice chat. In a comparable study, Soyoof et al. (2023) surveyed 500 Iranian English learners about their experiences with MMORPGs, finding that just over half of respondents confirmed they found conditions for language learning in MMORPG contexts. Finally, Albaqami (2022) surveyed 62 Saudi parents about the English development of their game-playing children during the COVID lockdown, finding that 80% thought gaming had a positive influence, especially on vocabulary and speaking, primarily because of peer chat, learning game instructions, and interactions with game narratives.

Complementing the survey approach, a few other recent studies involved qualitative focus on individual L2 gamers. In a rare qualitative study of L2 gaming in a language other than English, Kurata (2024) found that seven of the 12 learners of Japanese in Australia she interviewed played online games in Japanese outside of the classroom – one even explaining a primary reason for studying the language was so that they could comprehend stories in Japanese games (cf. Shintaku, 2023). In her study of six Norwegian adolescent L2 English readers and gamers, Ulfat (2024) found that L2 English served as a means for psychological escape via digital gaming; gamers preferred to play games in English rather than their L1 and that it was a positive outlet for stress. Finally, Ebadi and Ahmadi (2024) used narrative inquiry to study the game-enhanced multi-literacies development of an Iranian young adult, who learned English to an advanced level not through schooling but incidentally by playing a variety of games and watching movies on his own. They argue that, in spite of addiction fears and other concerns surrounding gaming, it contributes to cognitive, affective, and linguistic development as well as cultural knowledge.

A third area of research illustrates the potential of game-based L2 learning by showing how games and gaming serve as rich language learning ecologies. While much research has focused on the linguistic qualities of interactions among players during gameplay, the language found in games themselves and the discourses around and about gaming are linguistically rich, as first explored in studies like Thorne et al. (2012). For example, recent work by Dixon (2022) reports on a 1.1 million word corpus register analysis to identify the linguistic features of the games *Fallout* and *Skyrim*, two popular commercial entertainment titles, finding that mechanics like quest descriptions and dialogues have more in common linguistically across game titles than they do with other mechanics in the same game. Implications are that mechanics rather than genres should be the object of analysis in research. In another recent publication, Sylvén and Löwenadler (2022) also used corpus analysis to explore the linguistic features of a 180k word corpus of Let's Play videos – personalized walkthroughs of popular games made available on social media. They found that there were fewer instances of academic vocabulary as compared to news and examination corpora but that the difference was not great, and many uses were enhanced by contextual, textual, visual, and explanatory support. These pieces show the potential of corpus analysis in particular for research purposes; these methodologies might in the future be used in combination with learner data analysis –a gameplay corpus– to show evidence of input exposure, uptake, and noticing.

Take-aways:

- Game-enhanced L2 learning research shows affordances for SLA like NfM and heightened motivation in naturalistic, multiplayer gameplay with particular game titles, especially MMORPGs, cooperative multiplayer, and adventure games.
- Large scale survey research has shown that extramural L2 gaming occurs globally, and that many feel it is a productive way to learn an L2.

- Qualitative research on individual L2 gamers has found that players may be motivated intrinsically.
- Corpus analyses of game language and gaming discourse show that games can be linguistically rich and diverse environments.

3.1. Discussion

There is continued need for research on different game design features and how they are associated with L2 learning (Reinhardt, 2021) as interpreted through established SLA frameworks, as well as newer theories, for example embodied learning, or those adapted from other learning disciplines and relatable to gaming, for example proactive learning (Papi & Hiver, 2024); these theories can benefit reciprocally as well. As some have noted (e.g. deHaan, 2021), this sort of research has limited applicability to classroom practice; future research should attempt to state directly implications towards either game-enhanced pedagogy (section 4) or game development (section 5). When teachers are involved in these practices, learning outcomes improve (Dixon et al., 2022). It is healthy that L2 gaming is being researched as a social practice interrelated with broader societal and cultural trends, as this may inform the future roles of teachers – as guides, coaches, managers, and designers.

4. Game-enhanced L2 pedagogy

Game-enhanced L2 pedagogy research focuses on the formal, classroom-based use of published games for L2 instruction – either commercial, entertainment-purposed games, or serious or educational games not built by the researcher that are adapted for classroom uses. It has roots in publications like Meskill (1990), who noted that a commercial educational game like 'Where in the World is Carmen Sandiego' could serve as an interactive text and stimulate communicative interaction in an ESL classroom and Miller and Hegelheimer's (2006) study of 'The Sims' for vocabulary learning. Published accounts taking this approach now are often full-fledged pedagogical intervention studies with focus on the relationship between the game, the design of the materials and lesson, and learning and affective outcomes. Many studies are conducted by the instructors themselves, who usually also design the materials and implement the intervention. We found 13 notable publications on game-enhanced L2 pedagogy published in these four years.

Vocabulary lists and exercises are perhaps the most commonly used form of mediation in game-enhanced pedagogy. In recent research, Calvo-Ferrer and Belda-Medina (2021) describe an intervention involving 54 high school age learners of English in Spain where half received a list of vocabulary that would be useful to use during gameplay of the online, free-to-play multiplayer social deduction game 'Among Us'. Findings were that those students learned the vocabulary well, while those who were incidentally exposed to the words also learned them, but not quite as well; the authors credit this to the benefits of production and repetition, although priming could also have been a factor. Implications for pedagogy are to preview the specific language needed to play a game – not only the vocabulary built into the game, but language that is used during and around gameplay (see also York, 2020).

Materials can be more complex than just vocabulary lists, however. In his dissertation on the sociomediational affordances of digital gameplay on university-age learners of L2 Italian with the game 'Alba: A Wildlife Adventure', Johnson (2024) argued that the worksheet he designed served several purposes: it prompted game language-related discussions, guided players attention to useful in-game resources, acted as a record of linguistic and narrative meanings players encountered, and served as an anchor for post-play writing tasks. In addition, game-enhanced instruction can also reflect different pedagogical approaches, from translation to task-based. For example, to develop L2 Spanish reading competence in her US high school learners of low-intermediate Spanish, Al-Khanfar (2023) had them play and translate 'The Legend of Zelda: Ocarina of Time' from Spanish into English, under

the narrative pretense of having them work for a game localization company. Hosting the translation activities using Google Docs, she supplemented them with Gimkit vocabulary learning activities and had students use WordReference as needed.

Employing a task-based approach, Couture-Matte (2022) showed that reasoning and information gap tasks could promote focus on form and engage young English learners in Quebec who played 'Club Penguin', a MMORPG designed for children. To teachers wishing to adapt their instruction, the author presents the processes by which they developed the tasks, which focused on navigating an island, agreeing on locations, finding objects and locations, and writing directions collaboratively. Also focused on task design, Gao (2024) developed supplemental language and content-focused (science) learning tasks to accompany the physics simulation game 'Bridge Constructor Portal', having five high school ESL students do the tasks under the pretense of decoding a secret message. She found the tasks, rather than gameplay itself, led to language-related episodes (LREs), and that they focused on mostly lexical knowledge, such that the game served as a supplemental text to the tasks. Science talk also occurred during the tasks and gameplay.

Games can also be used in text-based approaches to reading and writing pedagogy. For example, replicating a previous intervention using the interactive crime-solving game 'Her Story' (Lee, 2019, 2023), Huertas-Abril and Muszyńska (2023) had college-age EFL learners in Poland and Spain produce texts that might have been found in the game world. The authors argue that the ambiguous, yet curiosity-provoking nature of the game narrative afforded creative language use in a variety of media. Illustrating the use of games in reading pedagogy, Ahmadian and Brevik (2024) describe an intervention in a Norwegian secondary school involving the stealth-action simulation game 'This Land is My Land'. A stealth-action simulation game is characterized by gameplay emphasizing covert strategies, where players engage in missions requiring stealth, strategy, and simulated real-world interactions, often within narrative-driven scenarios (e.g. espionage missions, secret operations). In this instance, players acted as indigenous characters in a fictionalized historical setting. The teacher had students read a novel set in an indigenous US American context, followed or preceded by gameplay. While students enjoyed gameplay-based and novel-based activities, students who played the game after reading the novel were more engaged in the game, while those who first played the game found useful contextualization in the novel later and wished they had read the novel first.

Two recent studies report the use of two different pedagogical frameworks for the designs of their game-enhanced interventions using the same adventure game, 'Life is Strange', illustrating the benefits of using such frameworks to guide materials design and implementation. Using Bridging Activities (Thorne & Reinhardt, 2008), Li et al. (2022) designed instruction that had ten Japanese learners of English use a course website and Quizlet around gameplay, framing each session with review, discussion, and debriefing (recollection and reflection) activities. Learners reported improved English knowledge overall, engagement with the game and instruction, and considerable appreciation for the presence and guidance of the instructor while playing and when completing learning activities; the authors note that both learner and teacher gaming literacy were complicating factors. Also working with 'Life is Strange', Aydın and Çakır (2022) used Dörnyei's L2 Motivational Self System and the Play, Curricular Activity, Reflection, Discussion (PCaRD) framework to design and implement a game-enhanced unit for 38 Turkish learners of English, comparing results with a control group. After students played an episode of the game at home individually, in class they completed a variety of multiple choice, fill-in-the-blank, and short answer questions about the episode designed to target and practice particular vocabulary and language structures and to spur reflection and discussion about the game narratives. Like Li et al. (2022), the researchers found the players truly enjoyed the game and materials, and although there was no significant difference in language skills when compared to the control group, the game-enhanced group showed evidence of increased motivation and sense of agency.

Two recent publications demonstrate game-enhanced approaches to content-based language instruction focused on mental health. Ahmadian et al. (2024) observed secondary school teachers

in Norway using a commercial game, 'Adventures with Anxiety', to both teach L2 English and mental health. They found gender differences in how teachers framed the game; female students were led to find examples of caring professionalism in the game, while male students were shown examples on how to deal with anxiety themselves. In another example, Zehne (2024) presents how a game, 'Hellblade: Senua's Sacrifice', might be used for critical discussion of mental health by focusing on player experience and on game representations and narrativizations of mental health. To situate the activities theoretically, she uses a literacies-inspired framework that considers gaming as an action or practice that affords focus on the relationship between a design and gameplay, at the same time, how a game is a text that relates to the player, their lifeworld, and a broader socio-cultural context.

Finally, a few recent publications bridged formal classroom and informal extramural gaming practices by having students complete the activities outside of class. Before their aforementioned study (Li et al., 2022), Li et al. (2021) created an extramural, self-guided set of materials that they had 11 Chinese learners of English use while playing the adventure 'Life is Strange'. They completed weekly, pre- and post-play activities using Quizlet on vocabulary and language items and interacted with an expert and each other on WeChat. Learners made vocabulary gains as measured by pre-, post-, and delayed post-tests, as well as increases in autonomy. Similarly, Shintaku (2023) had six learners of Japanese use a variety of online resources to play two Japanese games on their own while keeping journals, finding evidence for increased digital literacies and autonomy as learners saw their successes as personal milestones. Implications from both projects are that well-designed online standalone materials can successfully support extramural, independent game-enhanced L2 learning, and that there are effective alternatives to formal, in-class instruction.

Take-aways:

- Game-enhanced L2 pedagogical mediation is most often in the form of supplemental or 'wrap-around' materials that focuses students on language before, during, and/or after play.
- Materials often include vocabulary lists and exercises and can also focus on discussion and comprehension of game narratives and rules.
- Pedagogy can focus on different skills and reflect different approaches, for example, translation, task-based learning, text-based reading and writing, and content-based approaches.
- Frameworks can guide the design and implementation of game-enhanced instruction.
- Pedagogical mediation can be standalone, used for independent, extramural game-enhanced L2 learning semi-formally.

4.1. Discussion

Recent published scholarship on game-enhanced L2 pedagogy focuses on the design of learning experiences that help learners use an authentic artifact – a published digital game – as a learning resource, similar to accounts of pedagogical mediation surrounding a novel, film, news story, advertisement, or any genuine text not intentionally designed for learners. A major challenge this research addresses is how to maintain the immersive experience and maintain engagement while also intentionally learning. This requires that a game be 'learnified' in a similar way that a lesson is 'gamified' without using a pre-published game (see section 5). Focusing on the distinctions and interactions between pedagogical materials, on their designs and theoretical frameworks, and on the designs of the game is key to furthering research. Gaps in the research are that there is no research on assessment of game-based L2 learning, on student-design of L2 learning games (although see Schmidt, 2025) or consideration of non-digital games or hybrid designs. It may be that this scholarship is not published in CALL venues but is in language teaching in general, since it has to do with non-digital games – board, card, tabletop, or physical games (e.g. breakout games, see Bündgens-Costen, 2025). As noted by some (York et al., 2021), this is an issue in general with DGBELLT as a field, that the 'digital' moniker, which keeps the field part of CALL, also keeps scholarship on non-digital games out of consideration.

More research is also needed that analyzes the role of a teacher who did not create the materials in implementing an intervention – only Ahmadian and colleagues' work (Ahmadian et al., 2024) has addressed this in their research design; although others (Li et al., 2022; Poole & Clarke-Midura, 2023) discuss it briefly, it is not a primary focus of the study. What the teacher does during implementation is important to consider, as it contributes to the success of an intervention (Cornillie & York, 2025; Dixon et al., 2022; Wang, 2019). Classroom analytics, including discourse analysis, is a possible method for this sort of research; it also implicates the important but underresearched role of teacher education in DGBELLT (see section 6).

5. L2 learning game-based application design and development

In this section we discuss 32 recent studies, the majority of which describe the design, development, and experimental implementation of a custom-designed L2 learning game for a particular group of learners, attempting to associate the game's design with learning outcomes (Reinhardt, 2021). These fit into Sykes and Reinhardt's (2012) 'game-based' category, since purposeful language learning pedagogy is designed into the game itself, unlike 'game-enhanced' learning or pedagogy, which works with games not intentionally designed for formal language learning. Major themes of this research include the definition of 'game', associating designs with learning outcomes, immersive learning games, and design models and development processes.

5.1. What's in a game?

Some of the learning experiences described in recent research are arguably gamification rather than games, but we included them because their authors called them games. Some researchers consider the simple inclusion of engaging or amusing elements and multimedia sufficient qualification. For example, Patra et al. (2022) taught two groups of 25 EFL primary school students 90 vocabulary items, the control group by 'customary manner', and the experimental group with SHAIEX, the 'Adaptive Hypermedia System for the Teaching of Languages at the Early Ages', which the researchers call a game. However, Agudo et al. (2006, in Patra et al., 2022) describe SHAIEX not as a game but as an 'adaptive task generator' used to match images with words. While Patra et al. (2022) provide no further description of what exactly makes their experimental condition a game, they do share that the experimental group outperformed the control group in both immediate and delayed post-testing, going on to laud and expound upon the benefits of DGBELLT.

Whether or not a fun digital experience is a game is perhaps a matter of perspective. Jia et al. (2023) created a custom game-like augmented reality (AR) experience to teach English digestive system vocabulary, finding that 90 Chinese learners of English had better long-term retention with AR rather than with paper-based or mobile-based game methods to learn the same content. While it is questionable whether identifying the English names of internal organs by matching labels with three dimensional AR representations of them should be considered a game without any other defining game features or mechanics, the research does suggest promise for the use of augmented reality (AR) for vocabulary learning in general. As another example of the fluid boundary between 'game' and 'gamification', Zhang et al. (2023) created a set of vocabulary flashcards with multiple choice, matching, and cloze exercises that are gamefully related insofar as completing them successfully allows a player to escape a virtual room and collect gems, even though escaping and gems have nothing to do topically with the vocabulary. Because of this single overarching narrative pretense, the experience is called a 'game'.

Other researcher-developers do attempt to define their custom learning experience as a game by arguing that the inclusion of game features elements like chance-taking, goal-making, competition, or narrative qualifies it as IMMERSIVE, a key quality of games according to most, insofar as it allows players to experience a sense of flow, disconnect from real world concerns, and metaphorical transport

to another place. For example, Raffone (2022) developed a game-based application they called 'The Story of Wordland' that offered players points for correctly answering multiple choice vocabulary and grammar questions about authentic historical narratives, arguing that the narrative itself invokes immersion, although one wonders how having to answer comprehension questions in the middle of a narrative would not break the sense. Games can also be defined by what they physically entail, for example, Hung and Yeh (2023) describe a custom game designed as a treasure hunt for learning English with a board, pawns, dice, points, and puzzles, enhanced by augmented reality (AR); players used English to interact with the content and the game to develop creative thinking skills. Hung and Yeh compared an intervention with the AR-enhanced tabletop game with a 'relatively conventional game condition' (p. 1793) involving puzzle solving on a PC. In truth, whether an experience is a game or not is a subjective call on the part of the player and whether they experience it as a game, however that is defined. Reinhardt argues that this subjective disposition of 'gamefulness' is what qualifies a game, and that when consciously using a game for learning, a complementary disposition of 'learnfulness' can be involved (Reinhardt, 2019).

Take-aways:

- Research on game-based L2 learning applications often involves custom-designed games that are not published or commercialized, which makes replication and application to pedagogical practice difficult.
- There is no agreed exact definition of 'game', and studies do not always define what makes their particular application a game. Some published research that calls its application a game might better be understood as gamification.

5.2. Associating designs with learning outcomes

Many studies on game-based L2 learning attempt to examine the relationship between a particular game design and a gameplay outcome like learning or affect. Much attention recently has been given to learner anxiety, feedback mechanisms, and designs for vocabulary learning.

Building on work focused on the potential of games to promote willingness to communicate (Reinders & Wattana, 2014), some recent studies have focused on reducing learner anxiety. For example, B. Zhang et al. (2022, 2023) created a custom simulation game called 'Let's Make Spaghetti' and examined how the game impacted language learner anxiety as well as how group composition impacted learning outcomes among young Chinese English learners. Comparing a game condition with a non-game control condition (2022), they found not only better learning outcomes and lessened levels of anxiety but also positive reception among the game players. In their 2023 continuation of the study, they reported that the best outcomes were when students played together rather than individually, especially when groups included low anxiety players. Hwang and Zhang (2024) created a role playing game to test whether learner anxiety might be reduced by the behaviour of NPCs (non-player characters) with whom players interact in a game. They found better outcomes for interaction with adaptive NPCs in the game who would act as teacher, peer, or student depending on player behaviour, as compared to interaction with traditional NPCs, in terms of learning outcomes, self-efficacy, and lowered anxiety.

Recognizing that provision of and interaction with feedback is a key aspect of both gameplay and learning (Cornillie et al., 2012), recent research has designed custom games to inform how it might be done. For example, Calvo-Ferrer (2021) designed a custom (and later published) game, 'The Conference Interpreter', to examine the impact of repeated exposure to vocabulary, finding that among his Spanish university-level learners of English, while repetition in the game on its own did not associate with retention, there was some positive correlation when players knew that their production was correct. Also examining differences among feedback types, Liu and Hwang (2023) created a

custom role playing game (RPG) about a boy who attends a detective school, noting how learning outcomes corresponded with either metalinguistic feedback or simply error correction. Implementing the game with 76 university level English learners, they found more positive outcomes with the players who received metalinguistic explanations. Finally, working with similar feedback features using a published educational game, Pattemore and Gilabert (2023) found that young learners of English in Spain performed better using informational rather than metalinguistic feedback, that is, elaborative feedback that guided learners to correct specific errors rather than feedback with abstract information about structures. They speculate this may be because learners may find metalinguistic feedback useful but that it distracts from the sense of immersion.

Vocabulary learning, traditionally a major focus of DGBELLT research (Dixon et al., 2022; Govender & Arnedo-Moreno, 2021), continues to be the focus of much scholarship (perhaps too much; see section 2.1). For example, Ge (2024) reports on a study of 180 Chinese learners of English where a third played gamified vocabulary lessons in full anonymity, a third in partial anonymity, and a third in non-anonymity. Ge found that those playing in full anonymity led to more behavioural and emotional engagement as well as better learning outcomes. In a similar study, Zhang et al. (2023; above) examined how using a gamified set of vocabulary learning cards with matching and cloze exercises correlated with behavioural, cognitive, and emotional engagement among 50 Chinese learners of English, finding that various aspects of the game design offered differing levels of engagement – for example, the game introduction had low cognitive engagement, and 'the easy fun of enjoying the good-looking game elements' (p. 14) was related to emotional engagement. Using the same game, Zhang et al. (Zhang et al., 2024) later report that the addition of self-regulated learning features like planning and reflection activities increased player motivation levels. This confirms the findings of Chu et al. (2022), who created a vocabulary learning game to test whether integrating self-regulation and learning strategies into a game design would impact outcomes, after having noted that some players of such games lose focus. Forty-four university age Taiwanese EFL learners played two versions of the game, and learning outcomes were better for those who used the game that integrated explicit self-regulation activities.

Take-aways:

- Recent studies show that playing learning games with others cooperatively can lower anxiety, and NPCs with roles congruent with an educational setting – teachers and fellow students – might be better received when the game is played in a formal school-like context.
- Feedback is a key consideration in L2 learning game design and it may need to differ based on target age and proficiency.
- Design should consider the affordances of anonymity as well as mechanics that promote engagement and self-regulation at every phase or level of a game's design.

5.3. Immersive L2 learning games

While some of the above interventions might arguably be termed gamification or 'fun digital learning experiences' rather than games, several notable recent studies have created experiences that definitely qualify as games in our view because of their immersivity and narrative pretense (such games have also been termed 'contextualized' games by Yang and Li, 2024). Most of them are narratively set at a school or university campus, which perhaps lends them an authentic quality to their players. Some reports show a game developed primarily for a research objective, while others focus on the development processes and general application of the game; sometimes a follow-up study reports on an improved iteration of the game. For example, Chen et al. (2021) developed two versions of a custom adventure game, 'Academic Adventure', where players interacted with NPCs on a fictional college campus to complete various tasks; one version included explicit vocabulary exercises while the other did not. They found that, while the version without exercises still resulted in some learning thanks

to interactivity, stories, and multimedia representations, the version with the exercises led to better outcomes and more student appreciation. In a similar follow-up study (Chen et al., 2023), they found that mouseover glosses also improved outcomes. In another example, Taguchi and colleagues developed a custom game, 'A Day on Campus', and conducted two studies with Chinese EFL learner-players; Taguchi et al. (2022) report that the game led to improved pragmatics knowledge, and that players who engaged with the content by spending more time with feedback outperformed those who spent less time with it, not as measured by number of feedback repetitions but rather as time on task. Building on those findings, Taguchi (2023) found that the game led to improved knowledge of requests in particular, speculating that in-game perlocutionary effects functioned well as feedback for both gameplay and implicitly for development of pragmatics knowledge.

Two recent studies build on work on augmented reality (AR) game-based L2 learning (Holden & Sykes, 2011; Thorne, 2013); both are also set on college campuses. J. Lee (2021) created an AR mystery-solving game that 78 Korean learners of English played across their campus over seven weeks, along with a book reading activity. She reports higher levels of engagement with the game in comparison to the book activity, which she argues is because of a lack of cognitive challenge in reading for pleasure as opposed to problem-solving in the game. Also creating a custom campus AR game, Perry (2021) found that some designs evoked more group interaction – and thus language learning – than others through high-level co-regulation, as opposed to simple knowledge exchange tasks that did not lead to co-regulation. It seems that games whose narratives are thematically enhanced by the actual physical locations where they are played may be taken more seriously as learning tools than games that do not take advantage of where they are played, especially by learners who may not be regular gamers, in the same way as those that are set in places relevant to learners' lives like school campuses.

A few recent studies developed mini-games in virtual worlds (VW), that is, interactive, online 3D spaces where students can interact as part of formal exchange partnerships. For example, B. Zhang et al. (2022) report on a VW designed for interactions between Irish students and Chinese learners of English about to study in Ireland. They compared outcomes from text-based collaborations and gamified collaborations, finding the latter led to deeper intercultural exchange. Similarly, Jauregi-Ondarra and Canto (2022) created a VW where two classes collaborated using Spanish as a Lingua Franca by playing mini-games together, finding that the game content, game design, context of play (setting), relationship between partners, and the degree to which Spanish use was required all had a positive impact on student engagement. While these two studies did not measure learning outcomes, they are among the first to show that digital game-based virtual exchange is not only feasible but also has real potential for developing intercultural awareness and language development.

While themes connected to schools and universities are relatable to many students, they may not necessarily be narratively engaging to younger students. For example, Cui et al. (2022) created 'Bizhuwanshang', an interactive online storybook that affords bilingual Chinese-English exploration of Panda habitat ecological degradation and preservation; the authors intend it to be used for research on translanguaging–the collaborative, goal-oriented use of multiple languages across modalities. In another example, Poole et al. (2022) developed a custom RPG involving quests, dialogues, battles, and puzzles for learning L2 Chinese set in a historical-fictional China, 'Legend of the Dragon'. Implementing the game with 32 young learners and supplementing the game with a paper-based workbook, they found a range of learning affordances emergent from gameplay as well as improved outcomes in vocabulary and reading comprehension. In 2023, Poole and Clarke-Midura report on how learner-user data was culled from gameplay sessions and analyzed, in a rare methodological contribution to the field.

Take-aways:

- Game designers should consider incorporating some exercises and mouseover glosses in game designs, but also consider using natural responses from NPCs to provide language-related feedback.

- Designs that require interaction with the place they are played or player-player interaction, or those set in or on familiar, school-like spaces may be better perceived as authentic than those that do or are not.
- Collaborative game-based learning has potential for intercultural exchange.
- Features like RPGs, narratives, and puzzles can contribute to immersivity and engagement, especially among younger learners.

5.4. Design models and development processes

While many recent studies took an experimental research approach to focus on a particular design element, learner affect, or learning outcome, others focused more directly on the processes, or applied a model, to develop their game; this work can be very useful for would-be designers, as little has been available for design guidance that focuses specifically on L2 learning. For example, two studies used a model designed by Keller (1983 in Hao & Lee, 2021) for learning materials design and evaluation, guiding the design of games to motivate players by appealing to attention (A), being relevant (R), promoting confidence (C), and creating satisfaction (S) (the ARCS model). Hao and Lee (2021) used the framework to assess the motivation of young Chinese English learners who played several games the authors created to learn various English skills. They found that the learners preferred role play designs and were mostly motivated by 3D graphics, implicating those features in future designs. Expanding on their aforementioned 2022 and 2023 publications (Yang et al., 2023, 2022), Yang et al. (2024) used the model to design a game 'Making Dumplings', which they then found contributed significantly to improved learning outcomes for high anxiety learners. Similarly advocating a particular model, Chen, Li, and Kuo (2023) report on a system they used called 'Octalysis' to develop a game to teach L2 Japanese to Taiwanese adults. Similar to ARCS, the system focuses on motivational elements, for example, 'epic meaning and calling', 'development and accomplishment', and 'empowerment of creativity and feedback' (Chou, 2016 in Chen, Li, and Kuo, 2023). They found the game more engaging than traditional instruction given to a control group, and that engagement was driven by features promoting intrinsic motivation.

Two recent publications on culturally responsive L2 learning game development offer contrasting approaches to the process, one top-down and the other bottom-up. Ishaq et al. (2022) created a model that considered a variety of factors, beginning with requirements for L2 learning objectives, for example, content, pronunciation, vocabulary, or assessment. Socio-cultural considerations such as cultural context, social interactional needs, language specificities, and self-efficacy and self-determination needs are also considered first, as well as context of implementation and learner-player literacies. These then impact design choices, focused on mechanics related to goal orientation, achievement, reinforcement, features like points, levels, and ranks, and fun. Finally, game development proceeds iteratively with regular usability testing. In contrast to Ishaq et al.'s top-down model, Xu et al. (2024) offer a pragmatic, 'learner-oriented' model to develop a game for learning Irish, by adapting a game for EFL learning, via stories where 'malevolent forces seek to sabotage myths and ancient tales, attempting to destroy the memory of culture and heritage' (p. 1). They recount how the game was designed iteratively in consultation with teachers and learners, by adding and editing various elements, utilizing AI, and building and testing proof-of-concept and beta versions. Both approaches are useful to consider; the top-down approach attempts to capture all that might be involved in conceptual game design, while the grounded approach accurately reflects the actual, messy process of game development.

Take-aways:

- Established models can guide L2 learning game design processes.

- Both top-down models that reflect conceptual design processes and grounded models that reflect development can be used to create culturally and contextually sensitive games.
- Learning games can be adapted for new L2 learning contexts through iterative, learner-oriented processes.

5.5. Discussion

While research on the design and development of custom L2 learning games for particular contexts is useful in that it contributes to understanding of DGBELL and can often be applied to our generalized knowledge base about L2 learning game design, it has been critiqued (deHaan, 2021) because the applications are not usually made publicly available, for replication studies, as open educational resources, or commercially. In other words, these game-based language learning applications have been designed primarily for research purposes, that is, to test a particular hypothesis about a game design's relationship to positive L2 learning outcomes, behaviour, or affect. An unacknowledged impetus for this research is the reality of publish-or-perish academic culture, in that publishing an account of a one-time implementation of a custom-designed game-based application or gamified learning experience is rewarded, while publishing and distributing a finished game is not. In truth, publishing, supporting, distributing, and commercializing an educational game requires far more resources – time, money, and labor – than does publishing one or two articles about a basic version of it (see Reinhardt, in press).

Because most teachers do not have the programming skills, time, or funding to build a custom game for their own classroom, the implications of this research to pedagogical practice is not clear, unless it clearly implicates a particular mechanic identifiable in an adaptable, published game. While some user-friendly tools are available for teachers or learners to design and build their own games, they are underused (Berns & Ruiz-Rube, 2022), and game design is rarely part of teacher education on DGBELLT. On the other hand, if an important eventual goal of DGBELLT as a field is to produce or contribute to production of effective L2 learning games, an important audience of this research is serious L2 game developers and publishers, who have the means and interest to integrate these findings into games that might actually be published and marketed. Whether this audience reads this research, however, is a question this review cannot answer (see Reinhardt, in press).

6. Teacher education and development in DGBELLT

The years 2021 to 2024 saw a few published pieces on training language teachers in DGBELLT, an area that had been relatively ignored except for a few publications (Blume, 2019; Chik, 2012; McNeil, 2019); scholarship by programs like the University of Oregon's Center for Applied Language Studies (CASLS) and online publications like Ludic Language Pedagogy have also contributed to this endeavor, but empirical research has been scant. Scholarship has shown that preparing teachers to teach with games is challenging, often because of a disconnect between attitudes and practices. Chik's (2012) teachers were opposed to DGBELLT in spite of their students' interest, McNeil's (2019) pre-service EFL teachers in Korea noted that the practice was harder than they had expected, and Blume's (2019) pre-service EFL teachers had positive attitudes in general towards DGBELLT, but less personal experience playing games than expected.

For this review, seven studies were found that continue the work of these studies and confirm that challenges are significant and complex. For example, in response to the dearth of any large scale research documenting whether teachers actually do implement DGBELLT, Becker (2022) found that only six out of 73 practising EFL teachers and teacher trainees in Germany had done so, and while about half thought DGBELLT had merit, a quarter did not. With regards to reasons why not, the largest percentage said they did not because they did not understand legal issues regarding it, followed by insecurity about methodology and school support. Also showing hesitation, the 164 practicing

Greek EFL teachers surveyed by Koufopoulou and Karagianni (2021) reported barriers to DGBELLT such as time constraints, lack of equipment, student unruliness, and the inability to measure student progress. Many of their respondents had concerns about the perceived addictive quality of games, and three-quarters preferred non-digital over digital games, rejecting entertainment games as even appropriate. Panagou and Brailas (2023) interviewed 12 refugee teachers in Greece about what they would want in a serious L2 learning game, finding they wanted the game to allow level differentiation, to allow content to be altered as needed, to respect cultural backgrounds, to allow players to customize avatars, to provide integrated feedback, and to allow the teacher control over most aspects. Perhaps if such games existed, teachers might be more familiar with and less hesitant about the practice; however, no developer of a bespoke L2 learning or commercial L2 serious game to our knowledge has surveyed teachers before producing such a game.

Even with focused training, teachers may be hesitant because of the complexity of the practice. Belda-Medina and Calvo-Ferrer (2022) surveyed 154 pre-service teachers before and after completion of a four-week training module on DGBELLT. Attitudes improved with regards to understanding the usefulness of games and support for using games, but there was no significant change in confidence in how to use them in the classroom. One solution might be to have teachers build games themselves, which can be transformative. For example, Gallacher et al. (2023) taught game design principles to 147 Japanese pre-service teachers in a content-based English course focused solely on the topic, each week focusing on a particular mechanic. Groups created a board game as a final project, and final surveys indicated clear positive understanding and articulation of the topic. The potential of designing non-digital games (board, card, or tabletop role play) to develop game design and DGBELLT literacies is underexplored.

Reporting on a case study, Vitanova et al. (2022) described how the experience of participating in the design and testing of an educational game contributed to the identity development of a teacher who had very little previous gaming experience. Inspired by the desire to be a non-traditional teacher who considered student lifeworlds, the teacher found agency in the educational game development project, seeing game design as a way to express creativity and embrace curricular freedom. Finally, Reinhardt (2025) created a two-week unit on DGBELLT in a graduate CALL course, structuring the intervention according to multiliteracies pedagogy. After students situated their own practice through a survey, they explored interactive fiction, a gateway game that is easy to see as a language learning tool. They read and discussed theory and accounts of practice, and then proposed game ideas, showing evidence of potential transformed practice. Noting that two weeks is too short, the real transformation that might emerge from creating and testing out a game, Reinhardt calls for more treatment of game-based learning and pedagogy not only in CALL courses, but also in general L2 methods courses.

Take-aways:

- Surveys of language teachers shows both interest and hesitation at using DGBELLT, varying according to teaching and gaming experiences as well as cultural background.
- The very few reports of teacher training interventions in DGBELLT indicate promise in involving teachers in L2 game design and development.

6.1. Discussion

Although, as mentioned in section 4.1, there has been very little research recently that examines the role of teachers in L2 game design and development or during implementation of game-enhanced L2 pedagogy, some headway has been made recently in exploring attitudes, challenges, and possible frameworks for teacher education. There is clearly a need for more surveys on teacher practices and attitudes, as well as of educational stakeholders like administrators and parents (but see Albaqami, 2022) in a variety of schools and contexts, especially teacher education programs. Besides negative or

ambivalent attitudes, there is likely a lack of space or expertise in these programs and in CALL courses that might help explain the lack of research. There is also a need for continued effort at designing, implementing, and reporting teacher training interventions in DGBELLT and involving teachers in game design and development (Berns & Ruiz-Rube, 2022). It may be that DGBELLT will remain niche until the generation that played digital games as children become a critical mass of teachers, editors, and professors, finally bringing the topic of DGBELLT into CALL and language teacher education.

7. Conclusion

In summary,

- Recent reviews and meta-analyses of the field all agree that DGBELLT leads to positive learning and motivational outcomes, although many studies do not have sufficient numbers of participants to allow for statistical significance. In particular, it has been most commonly argued that DGBELLT has a positive impact on vocabulary learning, perhaps in detriment to focus on other skills areas. Moreover, methodologies and theoretical frameworks have been underdeveloped and teacher involvement has been underexamined.
- Recent non-interventionist research has focused on describing game-based L2 learning and L2 gaming, that is, playing games in an L2 extramurally. Using a variety of qualitative and quantitative methods, this research has focused on particular mechanics and genres as well as the learning ecologies of gaming. It is important because it contributes to our understanding of the future potential of DGBELLT and L2 gaming as a socio-cultural phenomenon.
- Recent studies of formal L2 pedagogical interventions show a variety of principled application of methods and approaches from language pedagogy, often informed by SLA. Vocabulary lists and exercises are still most common, but task-, text-, and content-based approaches have been designed and applied, sometimes using the same game title in different ways. As gaming becomes more widespread and innovative in design, so should game-enhanced L2 pedagogy in response.
- A large number of recent studies describe the design and development and experimental implementation of custom, non-commercial L2 learning games, finding that particular game designs and mechanics associate with motivation, affect, and other outcomes. While this research may be ecologically valid, external validity may be an issue because the games are for a particular context and rarely published or made available for replication studies. Still, it can inform custom and serious commercial game design as well as L2 learning game theory.
- Finally, some research has focused on L2 teacher education and DGBELLT, finding some challenges to discussing and integrating the practice more widely in teacher training curricula. Because of the popularity and potential of gaming as an L2 learning tool, however, L2 teacher education should focus on the practice not tangentially but as a key means to innovate pedagogically and motivate learners.

The time for more effort in DGBELLT scholarship and development is now, as evidenced not only by the 76 pieces of scholarship published recently from 2021 to 2024 reviewed in the current article, but by the fact that some estimates[3] are that 3.4 billion humans on Earth have played a videogame in the last six months of 2024, and that the global video game industry has generated USD $282 thousand million in revenue. Digital games are hugely popular with youth everywhere, and we owe it to them to continue researching how we can learn, teach, and use L2s through them. We believe that their integration into language learning and teaching is inevitable.

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Notes

1. https://www.verifiedmarketresearch.com/product/educational-games-market/
2. For the sake of brevity, 'games' will be used from here on to mean 'digital games', unless otherwise noted.
3. https://prioridata.com/number-of-gamers/

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