

**Investigating Digital Game-Based Language Learning:
Applications, Actors, and Issues of Access**

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This dissertation is dedicated to my sister, who taught me the most important lessons.

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Abstract

The research presented here examines the ways the products and practices of digital game-based language learning (DGBLL) shape access to foreign language learning. Three different studies with different methodologies and foci were carried out to examine the affordances of various aspects of DGBLL. The emphasis in all three cases, two of which are empirical and one of which is a theoretical investigation, is on developing a better understanding of the affordances of DGBLL to derive implications for English Foreign Language (EFL) teacher education.

In the first study, the focus is on constructing and implementing an evaluative framework to examine the pedagogical, linguistic, and ludic affordances of DGBLL tools. Analysis reveals that many dedicated DGBLL applications incorporate content, pedagogy, and game elements that are limited in their ability to reflect contemporary understandings of foreign language learning or generate motivation to pursue game-related goals. As such, they call into question existing typologies of DGBLL and emphasize the need for competent educators who can effectively align the selection of specific DGBLL tools with given language learning objectives.

In order to understand the preexisting knowledge and attitudes that need to be addressed to develop such competence, the second study examines pre-service English foreign language (EFL) teachers' beliefs and behaviors regarding DGBLL. The quantitative analysis reveals positive correlations between gameplaying and EFL skills and language learning strategies, and between gaming behaviors and beliefs about DGBLL. At the same time, low rates of gameplaying behaviors and negative correlations between prior digital media usage and attitudes towards DGBLL suggest the need for substantial theoretical and practical teacher preparation that takes into account underlying assumptions about gameplaying and foreign language learning.

The third study examines the basis of these assumptions, relying on Bourdieu's notion of habitus to illuminate the foundation of these beliefs and his notion of linguistic capital to consider the potential impact of a non-gameplaying habitus on some language learners. Such differential acceptance of efficacious DGBLL in formal school settings may inhibit access to significant forms of capital, and requisite linguistic and digital competencies.

While all three studies are limited in their scope, they hold important implications for teacher education. Given the nature of the applications analyzed, it becomes clear that, not only are particular applications appropriate for specific objectives; it must also be the role of teacher education to enhance pre-service teachers' (PST) abilities to understand these nuances and select media accordingly. This can only take place when PSTs' situated existing beliefs and behaviors, as illuminated by this research, are taken into account and addressed accordingly. Finally, this education must necessarily include initiatives to develop an understanding of issues of equity in access, participation, and outcomes as regards DGBLL.

Table of Contents

1	Introduction	1
2	Issues in DGBLL	3
2.1	Defining DGBLL	3
2.2	Why Use DGBLL?.....	6
2.2.1	DGBLL’s Popularity	6
2.2.2	Attitudinal Affordances of DGBLL.....	7
2.2.3	Linguistic Affordances of DGBLL.....	10
2.3	DGBLL Research and Its Gaps.....	11
3	Applications, Actors, and Issues of Access	13
3.1	Study 1: Blume, C., Schmidt, T., & Schmidt, I. (2017). An imperfect union? Enacting an analytic and evaluative framework for digital games for language learning. <i>Zeitschrift für Fremdsprachenforschung</i> , 28(2), 209-231.	13
3.1.1	Methodology	14
3.1.1.1	Instrument Development.....	14
3.1.1.2	Instrument Validation	15
3.1.1.3	Instrument Implementation	16
3.1.2	Findings.....	18
3.1.3	Conclusions.....	20
3.2	Study 2: Blume, C. (2019). Games people (don't) play: An analysis of pre-service EFL teachers' behaviors and beliefs regarding digital game-based language learning. <i>Computer Assisted Language Learning</i> , 32(1).	21
3.2.1	Methodology	24
3.2.1.1	Survey Development, Content, and Validation	25
3.2.1.2	Data Collection	26
3.2.2	Findings.....	28
3.2.2.1	Pre-Service Teachers as EFL Learners	28
3.2.2.2	Pre-Service Teachers as EFL Teachers.....	30
3.2.3	Conclusions.....	31
3.3	Study 3: Blume, C. (2019). Playing by their rules: Why issues of capital (should) influence digital game-based language learning in schools. <i>CALICO Journal</i> , 36(1), 19-38.	32
3.3.1	Methodology: The Evidence for Discrepant Gaming Patterns	32

3.3.2	The Role of Habitus and Capital in Attitudes towards DGBLL: Perpetuating Inequities	35
3.3.3	DGBLL for Educational Equity	36
3.3.4	Conclusion	38
4	Discussion and Future Research	39
5	Conclusion	41
6	References	45
7	Articles	59
7.1	Blume, C., Schmidt, T., & Schmidt, I. (2017). An imperfect union? Enacting an analytic and evaluative framework for digital games for language learning. <i>Zeitschrift für Fremdsprachenforschung</i> , 28(2), 209-231.	59
7.2	Blume, C. (2019). Games people (don't) play: An analysis of pre-service EFL teachers' behaviors and beliefs regarding digital game-based language learning. <i>Computer Assisted Language Learning</i> , 32(1), nn.	79
7.3	Blume, C. (2019). Playing by their rules: Why issues of capital (should) influence digital game-based language learning in schools. <i>CALICO Journal</i> , 36(1), 19-38..	103
8	Appendices	120
8.1	Appendix A: Prüfliste zur Analyse digitaler Fremdsprachenlernspiele [Evaluation tool to analyze digital foreign language learning games]	120
8.2	Appendix B: Survey of pre-service EFL teachers' media-related attitudes and experiences	141
8.3	Appendix C: Table of Articles	152

1 Introduction

Being able to receive and produce media with digital tools is, in high-income countries (cf. Fantom & Serajuddin, 2016), increasingly necessary in order to be able to participate in political, economic, social, cultural, and educational contexts. While there are myriad models of what constitutes such ability, knowledge of English discourse competence (cf. Hallet, 2008) is frequently a prerequisite. This is clearly visible in regards to digital games, which have emerged as a locus of popular and academic interest. Although regional digital games and production do exist, the demand is generally for large-scale productions that necessitate resources most widely available in English (Nichols, 2013, p. 21). Rather than providing passive entertainment, digital gameplaying has emerged as a significant receptive and productive activity with potentially beneficial cognitive, meta-cognitive, and interactive affordances that facilitate participation in a range of contexts (Lenhart et al., 2008; Martin, 2006; Stewart et al., 2013). It is for these reasons, for example, Jones (2017) argues, that a discourse model of video game literacy as one kind of multiliteracy necessitates examination within the structure of the EFL classroom.

This research argues that digital game-based language learning (DGBLL) is a critical aspect of English as a foreign language (EFL) instruction because of its role in contributing to the development of language and literacy skills critical for participation in contemporary society. While it shares many of the assumptions inherent in Jones' examination of video game literacy, the emphasis here is on foreign language learning rather than the specific ability to participate in discourse about and in games. The articles focus alternatively on (1) the nature of the media themselves, (2) the ways in which they are perceived by future teachers of EFL, and (3) the implications of these usages for learners, in terms of access to significant symbolic and practical benefits, in EFL instruction. Utilizing both empirical

methodologies – play research (cf. Aarseth, 2003) and inferential statistics (cf. Muijs, 2011) – as well as a conceptual argumentation, the three independent investigations are linked by their focus on utilizing digital games of various types in EFL teaching and learning environments. The underlying assumption is that, in order to understand the potential of using DGBLL in school contexts, it is critical to know what is available and consider how it can contribute to EFL. With that knowledge in hand, it is subsequently important to examine how future educators as gatekeepers to technology usage (cf. Cuban, 1986) perceive DGBLL in light of their own beliefs and practices, and the ways in which these beliefs and practices shape participation, for them and for their students, in digital educational and societal contexts. The research questions that emerge are thus as follows:

- To what degree does the nature of available DGBLL support the development of EFL competence?
- To what degree does the use of DGBLL shape pre-service teachers' EFL skills?
- What beliefs do pre-service teachers hold regarding DGBLL?
- In what ways do the aforementioned beliefs of (pre-service) teachers affect learners' access to EFL competence and digital literacies, and what are the implications in terms of equity?

Drawing on extant research in the fields of digital game-based language learning (DGBLL), as well as research on teacher beliefs, the conclusions contribute to an understanding of the ways the products themselves and the pre-service teachers' beliefs and behaviors mediate digital equity in educational settings. Beginning in chapter 2 with a clarification of DGBLL and existing research in this area, this paper will subsequently describe in chapter 3 the methodology and findings of the individual articles in greater depth. The overall goal of the research is to use multiple methodological and thematic lenses to illuminate various aspects of several inter-related pedagogical issues. The traditional “didactic triangle” (cf. Reusser, 2008,

p. 224)¹ is adapted here to consider, not just the interaction of students, teachers, and the object of instruction, but also the medium of instruction. Chapter 4 will synthesize the findings of the individual studies to highlight issues of note and chapter 5 will conclude by addressing some of the limitations of this work and identifying areas for further research.

2 Issues in DGBLL

2.1 Defining DGBLL

While research in DGBLL tends to distinguish between commercial, off-the-shelf games (COTS) that have been repurposed for language learning, and dedicated, educational games for language learning, there is no clear consensus favoring the former type of DGBLL over the latter, or vice versa, for language learning purposes. Nor is their unanimity in adopting these labels. DGBLL is an umbrella term used to refer to synthetic immersive environments (SIE) (Sykes, 2008), serious games (Ratan & Ritterfeld, 2009), gamified applications (Deterding, Dixon, Khaled, & Nacke, 2011), and interactive fiction (Pereira, 2013). Other categories include casual games, learning “apps,” and massively multiplayer online role-playing games (MMORPGs). Increasingly, multi-modal technologies and practices blur even these distinctions; when players discuss game worlds in online chats, it becomes unclear where the game ends and the social media begin. Interactive fan fiction, with practices such as fansubbing and scanlation (Sauro, 2017), is another illustration of how the boundaries erode between what is a game and what is beyond the game (cf. Jones, 2015).

Moreover, while many of the benefits ascribed to games have focused on specific types of games, it is not entirely clear that the type of game utilized is the relevant distinction. Researchers have found, for example, that some of the motivational benefits ascribed to

¹ The usage of a symbolic image such as the traditional didactic triangle, which is itself a semiotic form that is multimodal in its ability to transmit meaning, is eminently appropriate in an analysis of the affordances of DGBLL. Such a reading of the image addresses critiques regarding its oversimplification, recognizing its usage as a form of shorthand that leaves implicit complex understandings of learning and teaching, as suggested by Kleinbach (2005).

COTS are affected by integration into educational settings (De Grove, van Looy, Neys, & Jansz, 2012; Reinhardt, Warner, & Lange, 2014; Wechselberger, 2012). Given that the supposedly voluntary nature of play and therefore its attraction as a pendant to obligatory activity (Caillois, 2001, p. 6; Schmidt, Schmidt, & Schmidt, 2016, p. 11) is challenged when games of any kind are introduced into formal educational settings, the game type may be irrelevant.²

As a result of these considerations, Cornillie, Thorne, and Desmet (2012), question the appropriateness of a game taxonomy for DGBLL while at the same time acknowledging attempts to establish typologies based variously on game genres (cf. Mawer & Stanley, 2011, p. 21; Prensky, 2001, pp. 129–131), game elements (cf. Vandercruysse, Vandewaetere, & Clarebout, 2012), learning principles (cf. Gee, 2005), and learners' perceptions (cf. Hubbard, 1991). Although a number of research-based inquiries have emerged from all of these classification schemata, they necessarily reduce the complexity of available games and the intra-game properties themselves. Instead, Reinhardt and Sykes (2014) distinguish between game-enhanced, game-based, and game-informed instruction, emphasizing the relationship of the products to designed foreign language learning and teaching and the dispositions of the users toward gameful learning, rather than any innate characteristics of the applications themselves (see also Reinhardt, 2019, p. 8).

Alternatively, researchers in DGBLL have focused increasingly on the activities within and surrounding games. Here, too, however, the borders are often unclear. Game chats can occur both in-game and parallel to play, and mods (i.e., modifications) are constructed outside of the program, in order to be used in-game. Walkthroughs and commentaries

² Malaby (2007, p. 99ff.) questions the degree to which participation in many games is voluntary, and thus, the underlying assumptions about motivation. However, his argument that games are integral parts of vast areas of cultural and social experience is justification for examining both their motivational attributes, or lack thereof, and their application in formal educational settings. Questioning whether the type of game is significant, the activities therein, or the setting thereof, locates DGBLL at the nexus of cultural and social activity, of which formal education is one element (See also: Reinhardt, 2019, p. 46).

document gameplay while simultaneously engaging in meta-talk about the game. These activities reflect, not just the multimodality of games in terms of the way they address multiple sensory and semiotic channels simultaneously. Rather, they illustrate the layers of gaming activities that call into question linearity, chronicity, textuality, and authorship (Eskelinen, 2001; Lotherington & Jenson, 2011). Thus, while research into DGBLL has ostensibly focused on such products as MMORPGs (Anderson, 2010; Peterson, 2012), fanfiction (Black, 2006; Sauro, 2017), and virtual worlds (Biebighäuser, 2013) – to name just a few – these have more significantly served as vehicles to focus on constructs such as learner interaction, learner identity, and task-oriented language learning respectively.

Another approach to understanding DGBLL's affordances focuses on the types of players, or users who engage with specific objects for specific purposes, ranging from "pure" play to dedicated training. As Reinhardt (2019, pp. 62–66) notes, parallels have been drawn between the classic game theorist Caillois' (2001) types of play and types of players. However, as he also points out, this approach to categorizing gameplaying has its limitations. The multifaceted range of contemporary products, an oversimplification of game complexity, and the different ways any individual may engage with any product at any given time are in danger of being minimized when analyses of DGBLL focuses on taxonomies of players. This approach, moreover, does not mitigate the problematic definitional issues associated with the field. Who is defined as a "gamer" is fluid over time and negotiated based on issues of self- and other-identification, defined variously in relation to in-game behavior (Hamari & Tuunanen, 2014), motivation (Yee, 2008), game genre (De Grove, Courtois, & van Looy, 2015), gaming community affiliation (Kowert, 2014), gameplaying frequency, expertise, and investment of resources (Shaw, 2013), and mediated by issues of class, race, and gender (ibid.).

In the research described herein, various types of products, their nature, and their reception, are examined. Whereas the initial survey focuses on dedicated language learning

games and gamified apps, the subsequent analysis of pre-service EFL teachers' behaviors encompasses a wider range of game-like products and activities. In addition, queries regarding non-game-based and non-gamified digital media are included to understand better the "players" of these applications. In the final component of this research, the focus is primarily on COTS and their attendant products, defined variously as paratexts (Consalvo, 2007), the "Game" (Gee & Hayes, 2012), or the metagame (Salen & Zimmerman, 2003). However, in these analyses, the game type is subordinate to the affordances in, and literacies that emerge around, gameplaying with these tools by various types of users. In this way, a wide range of DGBLL is considered, not just in terms of products, but also in terms of situated practices.

2.2. Why Use DGBLL?

2.2.1 DGBLL's Popularity

While a number of paradigms describe how digital gaming is a meaningful educational pursuit which contributes to the development of important affective and cognitive competencies and which will subsequently be discussed as it relates to L2 learning more specifically, at a pragmatic level, digital gaming's popularity is, in and of itself, an incentive for using it for instructional purposes. Leisure activities pursued voluntarily are not frivolous, but rather are conducive to learning (Breuer, 2010; Gee, 2008). Far from being "merely" about "fun," play is an inherent element of learning, and specifically, language learning (Cook, 2000; Reinhardt, 2019, p. 49).

Despite the fact that data collected in the course of this research ultimately refines assumptions about the prevalence of digital gaming among some subgroups, the majority of the literature documents widespread gaming behaviors. According to the most recent study of children's and adolescents' leisure activities, 62% of youth in Germany engage in digital

gameplaying at least biweekly (Feierabend, Plankenhorn, & Rathgeb, 2017, p. 13). Although Blake and Klimmt (2012) identify a range of significant conceptual and methodological problems in measuring gaming activity, its global popularity among all age groups is reinforced by numerous studies and consumer data (Brand & Todhunter, 2016, p. 6; Chuang & Tsai, 2015, p. 120; ESA, 2015; Sundqvist & Sylvén, 2012, p. 198).

2.2.2 Attitudinal Affordances of DGBLL

The prevalence of digital games is one argument in favor of DGBLL; the attitudinal affordances for language learning ascribed to DGBLL bolster this pragmatic justification. While Cornillie et al. (2012) argue that interest in learners' "ludic engagement" can be traced back to early CALL activities in the 1960s, it is only since the 1980s that demands for intrinsically motivating activities have been addressed in CALL materials (p. 243), which have found their fullest expression in DGBLL. The motivational benefits ascribed to gaming have subsequently led to substantial theoretical and empirical analysis designed to illuminate this field. The ability of DGBLL to develop positive attitudes towards language learning has been examined from a variety of theoretical and empirical perspectives. Whereas Dickey (2005), for example, outlines the motivational features of digital games for learning on the basis of fundamental theoretical constructs regarding engagement, Yee (2006) utilizes empirical data to construct a model of motivational affordances.

The use of digital games can also help bridge the gap between authentic, i.e. extracurricular language learning, and formal language learning, and thus generate engagement. Although there is, on the one hand, resistance (from both learners and teachers) to integrating students' authentic lives in the classroom, there is an equally urgent sense, on the other hand, that incorporating such relevance will increase motivation, and subsequently, language learning (Grau, 2009). The dilemma of motivating students within the classroom, when external sources of English are much more motivating, is not new, but becomes newly

urgent in the face of ever-more compelling media (Henry, 2013; Legutke, 2012). Sylvén and Sundqvist (2012), for example, illustrate how elementary and middle-school gamers increase their linguistic skills through extracurricular gaming. More significant than the lexical gains enjoyed by these learners, however, is how this gaming activity shapes their attitudes to formal language learning in the classroom, which they see as divorced from authentic language learning (Henry, 2013), a critique echoed by disparaging references to “school English” in Grau’s (2009) study.

Not all researchers agree that games are significant for their authenticity in language learning terms. On the contrary; games are attractive precisely because they are distinct from other instructional tasks. Cornillie et al. argue that games are

self-referential systems, lacking any attempt to represent the ‘real’ world (Crookall & Oxford, 1990; Hubbard, 1991; Philips, 1987). Hence, as a ‘real-world system in its own right’ (Crookall & Oxford, 1990, p. 18), a game can be set apart from ‘authentic communicative activities, which relate to the real world, (and) formal language practice, which relates to the world of the classroom.’ (Hubbard, 1991, p. 221). (2012, p. 246)

Rather than *representing* authentic activities, the authors argue, games *are* authentic, and simultaneously playful, actions. Although the environments of games might be considered synthetic, the activities they cultivate encourage authentic language usage with both linguistic and non-linguistic goals, reflecting principles of task-based language learning (Franciosi, 2011; García-Carbonell, Rising, Montero, & Watts, 2001; Purushotma, Thorne, & Wheatley, 2009; Sykes, Reinhardt, & Thorne, 2010). Critical among these is the learner’s pursuit of an outcome he or she finds meaningful beyond the language learning that occurs and that reflects the learner’s authentic self (Henry, 2013). In the case of games, these outcomes may be related to universally-acknowledged game-playing goals, such as achieving a high score or

solving a quest, but what is significant is what Buendgens-Kosten (2013, p. 281) refers to as their “functional authenticity,” i.e., their rhizomatic emergence out of learners’ daily lives.

In addition to motivational affordances relevant for game-based learning, the use of language for gameplay is hypothesized to support language learning in a myriad of other attitudinal ways. Enjoyable games heighten learners’ willingness to communicate while eroding affective barriers to language usage (Reinders & Wattana, 2015). In this way, they are advantaged over face-to-face communicative opportunities in which learners encounter anxiety (García-Carbonell et al., 2001; Hwang, Hsu, Lai, & Hsueh, 2017; Rama, Black, Van Es, & Warschauer, 2012). Zheng, Young, Brewer, and Wagner (2009) found that as well as displaying more positive attitudes towards English, L2 learners participating in virtual worlds scored higher on self-reported measures of self-efficacy regarding English. A heightened sense of autonomy (Chik, 2012) and agency (Zheng, Wagner, Young, & Brewer, 2009) have also been documented in relation to DGBLL.

DGBLL further provides for an environment receptive to learning by minimizing the perceived psychological costs of limited knowledge. Gameplaying – digital or not – creates a safe space where weak or novice learners can acquire language skills with little loss of face (Klippel, 1980, p. 75). The incorporation of “fail states” into well-constructed digital games generates a safe space wherein mistakes form part of an enjoyable learning curve or provide the player with a sense of agency (Rama et al., 2012, p. 329). Reinhardt, Sykes, and Thorne (2010, p. 127) point out that just because errors take place “in game,” that does not necessarily make them insignificant. Instead, the authors argue, the opposite is true; communication in games is part of a web of complex, significant social interactions with meaningful consequences for the players. Despite the fact that these interactions take place in or around a game, they are “high stakes” interactions with significant communicative pressure. However, due to their other characteristics (e.g., voluntary nature, limited gameplay consequences, and boundedness), they are nevertheless conducive to communicative attempts.

2.2.3 Linguistic Affordances of DGBLL

Although methodological challenges require investigations to focus on narrow outcomes with limited variables, researchers have been able to consider not just affective, but cognitive affordances of DGBLL. Many studies have focused on the role of DGBLL in L2 vocabulary acquisition (Hitosugi, Schmidt, & Hayashi, 2014; Ranalli, 2008; Sylvén & Sundqvist, 2012), pronunciation training (Neri, Mich, Gerosa, & Giuliani, 2008) and grammar (Manneklint, 2015; Reichle, 2012). Others have examined the four skills (Allen, Crossley, Snow, & McNamara, 2014; Han & Wang, 2017; Liu & Chu, 2010; Neville, Shelton, & McInnis, 2009), concluding that DGBLL holds promise for all of these areas. In analyzing limited language growth in game-based interventions, deHaan, Reed, and Kuwada (2010) were able to illustrate the significant cognitive load demanded by such interactions. Further research has examined the mediating impact of varying feedback types (Cornillie, Clarebout, & Desmet, 2012), gender differences (Bonanno & Kommers, 2008; Manneklint, 2015; Sylvén & Sundqvist, 2012), and prior game-playing experience (Bonanno & Kommers, 2008; Chen & Johnson, 2004). Finally, each of the aforementioned has been considered for a wide range of game types, with the most prevalent distinction discerning between COTS (vernacular) and dedicated education games. In a meta-analysis, Chiu, Kao, and Reynolds (2012) found positive L2 effects for both, but greater positive effects for “meaningful” games as opposed to drills-focused games.

While quantitative measures are generally used to focus on specific linguistic skills, descriptive approaches are more frequently adopted to examine processes of communicative language learning. Sociocultural language acquisition theory supports the use of networked games, themselves sociocultural products. In this model of language acquisition, learners are able to successively access more complex concepts as a result of interactions with more advanced peers, as long as this communication occurs within their so-called Zone of Proximal Development (Vygotsky, 1978). Through the interaction that occurs among players in chats,

forums, and collaborative undertakings, L2 learners get implicit and explicit linguistic assistance from native language peers with whom they develop what Gee (2007, p. 27) calls affinity groups, enabling them to communicate in more sophisticated ways than they would otherwise be developmentally capable of (Peterson, 2012, p. 365). Collaborating in the completion of quests (Sykes et al., 2010) and contributing to paratexts (Apperley & Walsh, 2012) are meaningful interactions, facilitating comprehensible input and encouraging meaningful output using linguistically complex texts (Thorne, Fischer, & Lu, 2012) in situated contexts (Gee, 2007). At the same time, games theoretically provide students with access to a language-rich environment, even as questions remain unanswered regarding the degree of immersion that is desirable and necessary for various language learning goals (de Freitas, Rebolledo-Mendez, Liarokapis, Magoulas, & Poulouvasilis, 2010, p. 73; Reinhardt & Sykes, 2012, p. 44).

2.3 DGBLL Research and Its Gaps

Academic interest in DGBLL has emerged from a number of disciplines, yet with a substantial foundation in the groundwork laid by the praxis and theory of computer-assisted language learning (CALL). Research into CALL, which is usually dated from the 1960s onwards, itself derives from a range of fields, including applied linguistics, artificial intelligence, psychology, instructional design, and human computer interaction, with both fruitful and problematic approaches emerging from each (cf. Levy, 1997, p. 48). In addition to descriptions of the types of CALL applications that have developed over the decades, often in alignment with pedagogical trends (cf. Warschauer & Healey, 1998), emerging technological capabilities and efficacy studies have played a prominent role in this research (cf. Golonka, Bowles, Frank, Richardson, & Freynik, 2012). This latter preoccupation has not been without its critics, with Pederson (1982) arguing almost forty years ago that the focus should be on evaluation models for CALL programs with potential longevity. A final area of intense

interest, as indicated in chapter 3.2, is on the (lack of) adoption of CALL in formal language learning settings, with some empirically tested models claiming to be able to account for up to 90% of teachers' technology adoption intentions (cf. Petko, 2012). All of these trends are reflected in DGBLL research, as a relatively recent CALL phenomenon.

Reinhardt (2013) points out that there is a large number of studies in DGBLL, but at the same time, there are few cohesive approaches. This is due, in part, to the interdisciplinary nature of the field, drawing as it does from media studies, computer science, language acquisition, education, anthropology, and sociology. Another reason for the lack of stringency derives from the ecological nature of DGBLL (research), which is “messy and non-linear, not least of all because the parameters are interrelated, and when one feature of a study changes, it affects other features” (Reinhardt, 2019, p. 240). While this is true of research in general, the ergodic nature of games intensifies the interactive and interdisciplinary complexities, as does the complexity of game types and gameplay instantiations. Likewise, pragmatic and communicative language usage and learning can only be appropriately analyzed in situated contexts that are grounded in interaction; require interdisciplinary understandings; are both non-linear and emergent; and convey a range of purposes, including playful ones.

There are numerous both quantitative and qualitative studies documenting the efficacy of games, gamified, and game-like applications in improving a range of language-related skills. These suggest DGBLL may be an effective method of EFL instruction. However, these outcome evaluations do not answer a range of other questions that need to be addressed before DGBLL enters the mainstream language learning classroom. A comparative analysis of a large number of products has heretofore not been undertaken, nor have methods been developed to evaluate the appropriateness of individual applications prior to adoption. While this dearth might help account for the reluctance of teachers to adopt DGBLL, a deeper understanding of why teachers do not adopt DGBLL, specifically in the context of their broader technology-related teacher beliefs and practices, is needed to understand the

relationship of DGBLL adoption to these other issues. Finally, the implications of such non-usage need to be considered in relation to EFL learners in formal language learning settings, and the significance of DGBLL beyond “mere” language acquisition examined. The following three studies address these specific research gaps.

3 Applications, Actors, and Issues of Access

3.1 Study 1: Blume, C., Schmidt, T., & Schmidt, I. (2017). An imperfect union? Enacting an analytic and evaluative framework for digital games for language learning. *Zeitschrift für Fremdsprachenforschung*, 28(2), 209–231.

The first research study in this series had two goals. It set out, firstly, to develop an evaluation tool with which the pedagogical, linguistic, playful, and usability-related aspects of widely varying applications could be examined and categorized. At the same time, the purpose of implementing this checklist was, in addition to assessing its serviceability, to examine the nature of available dedicated digital language-learning games. While the resulting analysis does not purport to quantify comprehensively the nature of commercially available products for language learning, it is able to identify common patterns and features. By drawing on existing theoretical and empirical work in the areas of digital game-based learning, language learning pedagogy, and usability research, it was possible to construct an evaluation instrument to facilitate the examination of a larger number of DGBLL products from a variety of disciplinary perspectives. Doing so enables the better identification of appropriate applications for specific target groups and language learning purposes, while taking into account such features as playability, accessibility, and pedagogical approach. Moreover, the examination of a set of commonly available applications facilitates analyses regarding the prevalence and nature of particular features in each of these areas.

3.1.1 Methodology

3.1.1.1 Instrument Development

The evaluative checklist was initially constructed by drawing on existing approaches in CALL evaluation that do not focus on DGBLL (cf. McMurry et al., 2016). Elements of pre-use frameworks modeled by Hubbard (2006), Chapelle (2001), and Leakey (2011) were adopted to examine issues relating to appropriateness for individual learners in terms of pedagogical design, learner control, and principles for material development. Items were also extrapolated from models for examining one type of digital language learning product, such as websites (Kettle, Yuan, Luke, Ewing, & Shen, 2012), self-access materials (Tomlinson, 2010), mobile-assisted language learning (Stockwell & Hubbard, 2013), and serious games (Meyer & Sørensen, 2009; Suttie et al., 2012). However, given that not all of these address DGBLL specifically, these elements were complemented by items utilized in the evaluation of digital game-based learning that do not focus on language learning, such as the Four Dimensional Framework (de Freitas & Oliver, 2006), the revised Game Object Model (Amory, 2007), and the SIG-GLUE framework (Dondi & Moretti, 2007). Additional items were included to more precisely assess the following aspects of digital game-based learning: engagement (Whitton, 2010), game achievements (Hamari & Veikko, 2011), feedback (Conati & Manske, 2009), adaptivity (Peirce & Wade, 2009), interactivity (Strzebkowski & Kleeberg, 2002), and social interaction (Bopp, 2006).³

³ Research published after the instrument was developed has since shed further light on these constructs and their measurement, such as Esteban-Millat, Martínez-López, Huertas-García, Meseguer, and Rodríguez-Ardura (2014); Arnab et al. (2015).

3.1.1.2 Instrument Validation

Ultimately, a team of researchers designed and piloted a checklist with eighty items in five categories (Appendix A). The completed tool, with single choice, multiple choice, Likert scale, and open-ended queries in the areas of background information, didactic analysis, didactic interactivity, game-based characteristics, and user experience, subsequently underwent partial reliability testing. Participating coders addressed different analyses with regard to high-inference items in a recursive dialogue, and co-constructed a coding manual that explicated individual items more thoroughly. Given the large number of open-ended items, the limited number of coders (3), and the challenge involved in coding even one program completely (cf. Aarseth, 2003, p. 4; Burston, 2003, p. 35; Hubbard, 2006, p. 1), no quantitative measure of interrater reliability was carried out. This would need to happen in a subsequent study to validate the findings more thoroughly. Regardless, the descriptive statistical analysis carried out on the collected data reveals trends and issues for further exploration.

While the development and implementation of an evaluative tool is not necessarily novel, as indicated by the manifold sources of variables adopted, conducting these activities in relation to DGBLL is relatively unique. Few theoretical or empirical approaches to digital game analysis are available. Existing approaches generally focus on the interaction of the user with the game, either in the form of usability testing or with a focus on the outcomes for the user-player. However, usability testing does not traditionally address the pedagogical elements of the product, which is a significant focus here. Tracking player behavior through observation, stimulated recall, skill testing, screen recording, or eye-tracking would provide insights into the responses of the users and the effects of the game-play, but would offer limited pre-use analysis of embedded learning theories, control of design elements, adaptivity, or content accuracy.

3.1.1.3 Instrument Implementation

In light of the diversity and number of applications that could be considered digital games for language learning, the first phase of this research focused on dedicated language learning applications that integrate gameful elements. There continues to be a lack of clarity regarding definitions of what constitutes a game, with the criteria often varying according to researchers' and players' pursued aims. In this research, it was decided to concentrate on programs that identify themselves as appropriate for language learning purposes. This eliminated COTS in the commonly understood definition as products designed primarily for enjoyment. Even this distinction is, theoretically, imprecise, given that language learning applications with gameful elements are technically, commercial products. However, the acronym COTS has come to define products without an academic focus, and this was the distinction maintained here.

Included in the analysis, on the other hand, were products that are both commercial and academic, and hence either purchasable and freely distributed or accessible. Products that are identified as games were, obviously included. Furthermore, applications that are not explicitly marketed as games but clearly possess game elements or mechanics were included. As a result, both games and gamified applications were considered as equally critical components of DGBLL. Further criteria ensured a broad range of product types, price points, and platform compatibilities. The selection process also considered popularity as an important criterion, especially in light of claims regarding the reach and efficacy of such well-advertised and highly monetized products. The final sample of fifty applications thus does not reflect an equal distribution of products in terms of program type, language, financial stature, or reach, but instead strives to reflect the breadth and diversity of publicly accessible language learning applications.

For analyzing the games and gamified applications themselves, elements of both expert review and playing research were adopted. In the former approach, experts review a

prototype of product, or the product itself, for a limited amount of time in accordance with preordained heuristics devised for this purpose (cf. Korhonen, 2010). This approach, utilized primarily for product development and evaluation, was supplemented by epistemic knowledge of “playing research” as described by Aarseth (2003). In Aarseth’s conceptualization, the researcher, who is to some degree an assumed expert, is also a player. However, unlike in an expert review, the game’s ecological affordances are an integral part of the analysis, which can take place in one of three levels (gameplay, game structure, and game world) and can be played by a minimum of fifteen player types in at least seven different “strata” of play (Aarseth, 2003, p. 6). While playing research more accurately describes the method used to analyze the programs in this study, aspects of expert review as elucidated by Korhonen were also integrated, such as the use of the previously developed heuristic to assess the various game elements.

This combined approach does not entirely mitigate the challenge of evaluating games for language learning purposes, given the ecological nature of the interactions that take place (cf. Zheng, Newgarden, & Young, 2012). Every decision taken within game relies on a set of underlying expectations and assumptions of the player-researcher, and each of these decisions in turn influences subsequent game opportunities, gameplay interactions, and content. While not guided by stringent typologies of gameplayer types (cf. Bartle 1996) or player positions (cf. Aarseth, 2003, p. 6), attempts were made to play as different types of players with more or less consistent styles. However, limitations even with this approach are obvious. Moreover, Aarseth’s paradox, that free game play and game analysis are at odds with one another, was evident more than once, where flow (cf. Csikszentmihalyi, 1990) was interrupted for the sake of data collection, and the tension between performance and analysis (cf. Aarseth, 2003, p. 5) led to inconsistent player behaviors that could influence the findings.

The gameplay itself was supplemented with published information about the programs, including, where available, user reviews, press releases and news articles, research

reports, developer/owner documentation, and walkthroughs. In some cases, prior knowledge about a product or its development, or queries to the developer, supplemented the gameplay and public documentation, and offered, in some cases, a means of triangulating the data. Nevertheless, it is clear that analyzing any number of games with such a complex analytical tool is an incomplete and imperfect process. Despite the use of a primarily quantitative instrument, the process and the resulting data require a thorough understanding of the challenges inherent when the researcher is a participant.

3.1.2 Findings

The article discusses both the analysis of the fifty language learning applications, and the instrument used to conduct this analysis. The conclusions take into account the applications and the tool from a variety of standpoints, including content, pedagogy, interactivity, and usability in the first case and praxis value in the second case.

Given the nature of the content, pedagogy, and interactivity of the fifty products that were examined, significant questions emerge as to whether, and to what degree, the use of these applications can contribute to meaningful foreign language learning. Despite measures taken to ensure a representative selection of products, the majority of the applications reveal content, pedagogy, and interactive opportunities that are limited in their ability to reflect contemporary understandings of language learning or acquisition, adapt to the learner in appropriate and efficacious ways, or generate motivation to pursue game-related or language learning goals.

Specifically, the majority of programs examined in this analysis reinforce simplistic pedagogical methods and content. Closed formats, a focus on receptive skills, an emphasis on elementary items, and the prevalence of immediate and simplistic feedback all convey a behaviorist approach to language learning. For example, while 32 applications incorporate multiple choice questions, only three applications appeared to include collaborative tasks.

Likewise, only four programs support communication with other players or tutors. Learners who rely on these applications to learn a foreign language will enjoy multiple and varied opportunities to encounter and practice vocabulary items at the A1-B1 levels. This is especially true if these learners are motivated by simplistic game design elements, such as leaderboards, point accumulation, or progression.

Coupled with limited didactic interactivity, such methods fail to tap into the types of affordances found in compelling digital games, such as autonomy, personalization, meaningful goals, and interactivity (cf. Gee, 2005; Purushotma et al., 2009; Reinhardt, 2019). The learner's lack of agency is derived from the general absence of scaffolding (absent in 82% of the applications), adaptivity (absent in 86% of the applications), or task complexity (absent in 94% of the applications). Interactivity is limited to point-and-click actions that reflect neither the learner's linguistic or gameplaying interests, nor her capabilities.

The game elements disproportionately implemented in these applications reinforce the disenfranchising tendencies found in the areas of pedagogy and interaction. Narrative games, including those that could be considered text or graphic adventures, simulations, role-play, and strategy-based applications are underrepresented in this sample (present in 18% of the applications) while quizzes and puzzles (found in 150% of the applications) predominate⁴. Feedback is synonymous with gameplay reinforcement; simplistic content (such as vocabulary) combined with simplistic pedagogy (e.g., multiple choice) is easily measured with discrete game mechanics (e.g., points, levels, and visual validation) that do not (need to) distinguish the adequacy of nuanced responses.

⁴ Totals over 100% are possible because one application may have various activities in different game-type categories.

3.1.3 Conclusions

This initial study reveals, in sum, that many popular, gamified language learning applications are inadequate resources in terms of constructivist, sociocultural language learning. As a result, the outcomes achieved by using such applications, while potentially efficacious for the development of individual, receptive skills, are unlikely to generate the kinds of multimodal literacies, self-regulatory competencies, and meaning-making opportunities described in relation to e.g., COTS, SIEs, or some serious games, as described in chapter 2. In light of these qualifications, it is critical for (pre-service) teachers, as well as language learners, to be able to identify and critically select applications that align with their instructional objectives. Imparting this skill is a relevant component of teacher education for contemporary language learning.

A second goal of this study was, in addition to examining the nature of given language learning applications, to develop and reflect on a tool designed for the aforementioned evaluation. Given its depth and breadth, the evaluation tool makes it possible to identify the features and content of the tested applications, and to consider the ways in which elements of pedagogical and game-based design interact with the user and with one another. Yet the extensive nature of this checklist likewise poses a challenge to use. In light of the variety of concepts the instrument addresses, the inferential nature of many queries, and the need to combine elements of expert review and playing research, the evaluation tool functions as an appropriate academic research methodology. Whether this, in turn, serves to facilitate the selection of appropriate applications for specific learners remains an unanswered question.

3.2 Study 2: Blume, C. (2019). Games people (don't) play: An analysis of pre-service EFL teachers' behaviors and beliefs regarding digital game-based language learning. *Computer Assisted Language Learning*, 32(1).

The second study in this investigation, a survey of pre-service teachers of EFL at the Leuphana University Lüneburg, emphasizes the users, rather than the products highlighted in the initial project. This focus rests on assumptions regarding the critical role of (future) teachers in influencing the adoption of digital tools, subscribing to the notion that new technologies or usages will not find their way into the classroom unless teachers shepherd them in (cf. Cuban, 1986). If the future of school-based EFL is to incorporate efficacious digital tools, including playful ones, it is essential to understand, relying on research from a variety of theoretical perspectives, how teachers think about these scenarios before implementing training.

There are myriad analyses that illuminate the complex and situated nature of (pre-service) teachers' beliefs regarding game-based learning. Many of these emphasize extramural factors, such as personal gameplaying experience. The findings in this regard are inconsistent, although most analyses conclude that prior digital gaming has a positive influence on (pre-service) teachers' inclinations towards game-based learning (Chik, 2011; Graham, 2008; Martín del Pozo, Basilotta Gómez-Pablos, & García-Valcárcel Muñoz-Repiso, 2017); exceptions are Bourgonjon et al. (2013) and Schrader, Zheng, and Young (2005). Equally inconsistent are the findings regarding the influence of demographic factors such as age, teaching experience, and gender in shaping PSTs' or teachers' attitudes (Baek, 2008; Hamari & Nousiainen, 2015; Idris, Sin, & Ya'u, 2015; Koh, Kin, Wadhwa, & Lim, 2012). Further research has focused on the influence of cultural perceptions of digital games (Baek, 2008; Bösch & Kattner, 2011; Koh et al., 2012), including institutional norms (Bourgonjon et al., 2013), conceptions of appropriate leisure media usage informed by habitus (Friedrichs, 2015; Kommer & Biermann, 2012), and of attitudes towards the role of play in education

(Reinhardt & Zander, 2011). Other examinations describe the intricate sociocultural and socioeconomic contexts within school and subject-specific communities that shape beliefs regarding appropriate types of school content and methods (Grau, 2009; Ottesen, 2006; Warschauer, 2003).

Medium-to-large-scale surveys measuring teachers' attitudes towards digital game-based learning seek to quantify the influence of the aforementioned factors, often including additional variables as well. Many of these are elaborations of the original Technology Acceptance Model (TAM), informed by theories of self-efficacy (Davis, 1989), and which has gone through numerous iterations. De Grove, Bourgonjon, and van Looy (2012) sought to identify predictors of teachers' attitudes towards game-based learning by determining the precursors to ease of use and usefulness, and found that curriculum-relatedness is a significant factor for both perceived ease of use and perceived learning opportunities, which in turn impacts both behavioral intention to use and perceived usefulness. Whereas prior experience had a positive effect on perceived ease of use, it had a negative effect on perceived learning opportunities, which the authors hypothesize could result from a mismatch between the games, the curriculum, and students' expectations (p. 2030). Teo, Lee, and Chai (2007) broaden the basis of the TAM in their analysis of Singaporean PSTs' attitudes towards game-based learning, identifying subjective norms and facilitating conditions as critical factors influencing attitudes.

By demonstrating that antecedents of the TAM such as facilitating conditions, self-efficacy, computer anxiety, and intrinsic motivation inform perceived ease of use, Venkatesh (2000), in what he dubs the Unified Theory of Acceptance and Use of Technology, highlights a myriad of belief-related constructs that have since been examined in relation to acceptance of game-based learning (cf. Ibrahim, Khalil, & Jaafar, 2011). In a study by Bourgonjon et al. (2013), which considers eight factors that explain 57% of the variance in teachers' acceptance of digital gaming (p. 31), the authors conclude that teachers' acceptance of game-based

learning cannot be satisfactorily explained by the (extended) TAM alone. To understand teacher uptake, an analysis of different types of knowledge across various domains is necessary (p. 32).

This analysis of the intersection of knowledge in various domains is the approach taken by the technological-pedagogical content knowledge competence (TPACK) model (Mishra & Koehler, 2006). Hsu, Liang, Chai, and Tsai (2013) developed the TPACK-G to measure the four technological constructs of TPACK as they relate specifically to digital games. Subsequent studies have validated these constructs among preschool, elementary, and middle school teachers in Taiwan (Hsu, Tsai, Chang, & Liang, 2017), but have not explored subject-specific differences. Existing subject-specific examinations of TPACK for EFL do not address DGBLL (cf. Baser, Kopcha, & Ozden, 2015; Debbagh & Jones, 2017; Tseng, 2014) or teachers' attitudes towards DGBLL (cf. Tai, 2013; Tseng, 2017).

Only one quantitative study to date considers teachers' attitudes towards DGBLL. Alyaz and Genc (2016) and Alyaz, Spaniel-Weise, and Gursoy (2017) studied both vocabulary growth and attitudes towards DGBLL among Turkish pre-service teachers of German in an intervention study, ascertaining that a sizeable majority (86.7%, $n = 52$) were generally receptive towards the idea of DGBLL (p. 133). The remainder of their analysis, both qualitative and quantitative, focuses on the language growth of the informants. Although the authors examine age and gender in relation to vocabulary outcomes, they do not use demographic or contextual items to examine the group's beliefs about DGBLL. These analyses serve as foundations for understanding teacher attitudes towards DGBLL, but only Chik (2011; 2014) uses empirical data to focus specifically on a subject-specific understanding of teachers' digital, playful, language learning beliefs. Chik addresses prior experience, sociocultural norms towards playful education, and attitudes towards English language gameplaying and knowledge.

One goal of this research is to generate an understanding of the degree to which pre-service EFL teachers' beliefs and behaviors towards DGBLL are congruent with other analyses of teachers' and learners' beliefs, in regards to both ICT and digital game-based learning, within a specific sociodemographic or cultural or structural setting. Existing findings on these subjects yield inconsistent conclusions (cf. Bourgonjon et al., 2013, 2013; Corrin, Lockyer, & Bennett, 2010; De Grove, Bourgonjon et al., 2012; De Grove, Cornillie, Mechant, & van Looy, 2013; Karaseva, Siibak, & Pruulmann-Vengerfeldt, 2015; Schmid, Goertz, Radomski, Thom, & Behrens, 2017; Teo, Kabakçı Yurdakul, & Ursavaş, 2014), highlighting the importance of research contextualized for specific populations and subjects, utilizing various frameworks (cf. Benson, 2018, p. 333). Given the general absence of existing quantitative studies, the research thus seeks to address knowledge gaps regarding subject-specific, digital game-based learning among pre-service teachers in Germany. A focus on this group can illuminate the degree to which it reflects trends among other populations before considering implications for teacher education and classroom instruction.

3.2.1 Methodology

The survey draws on existing questionnaires in order to provide opportunities to compare the findings with this population in relation to other populations; to allow a focus on DGBLL as a subset of both CALL and ICT; and to focus on relationships among constructs and items validated in previous studies. Despite the use of pre-existing surveys, most of the individual items required adaptation to focus specifically on DGBLL, as existing publications in this area are scarce. Quantitative research regarding teachers' attitudes towards DGBLL specifically (as opposed to CALL in general or ICT for educational purposes) is virtually non-existent. Thus, existing instruments served here as frameworks for more tailored queries.

3.2.1.1 Survey Development, Content, and Validation

Frequency items from the International Computer and Information Literacy Study (ICILS) (Bos et al., 2014) were adapted and elaborated to enquire into the informants' use of DGBLL in their own pre-university schooling. While the ICILS is much broader, measuring for example the competencies of teachers and secondary-level learners regarding ICT, one component focuses on the frequency of usage in educational settings for specific tasks (Eickelmann, Schaumburg, Drossel, & Lorenz, 2014, pp. 214–226). Since the exact wording of the ICILS items is not available, the underlying concepts served as the basis for the development of comparable queries. Given that the ICILS does not focus on subject-specific items in terms of frequency of usage, additional items were generated to reflect activities specific to EFL, as derived from the literature on CALL and DGBLL. These 11 items were presented in a 4-point Likert scale that, despite the variety of activities, had a Cronbach's alpha of .778.

A subsequent set of nine questions focused on the PSTs' current use of digital technologies for educational and leisure activities. These queries, distributed in a 5-point Likert scale, repeated some items from the previous scale, but eliminated many activities that would take place solely within the confines of a formal educational setting (e.g., “completing Web quests”). On the other hand, parallel inquiries compared the informants' German-language (as the assumed L1 of the majority of the respondents) and English-language behaviors. Thus, the respondents indicated their gameplaying behaviors both in German and in English. Analyses of responses here demonstrated little consistency, but rather, typologies of usage, as discussed in the results in detail.

A further section of the survey addressed the informants' beliefs about DGBLL. Items from instruments that rely on constructs from the Technology Acceptance Model (TAM) were used as the basis for these ten questions, also measured with a Likert scale. Given the paucity of available tools, with the exception of one survey by De Grove et al. (2013), existing

questions from more generic TAM or game-based learning surveys were modified to reflect the specific focus on DGBLL (cf. Can & Cagiltay, 2006; Ibrahim et al., 2011; Teo, 2008). In keeping with prior research regarding the TAM, the responses reflect a tripartite set of attitudes reflecting beliefs about perceived usefulness, perceived ease of use, and perceived contribution to the given skill, i.e., English language learning.

To assess self-perceived English language skills and English language learning strategies, 20 items were adapted from the Common European Framework of Reference (CEFR) (Council of Europe, 2001) at the B2 level and eight items from the Strategic Inventory of Language Learning (SILL) (Oxford, 1986). While statistical validation of the CEFR for this purpose does not exist, Cronbach's alpha of .921 indicates it may be appropriate to use in this way. The reduction of the SILL to eight items led to an adequate Cronbach's alpha of .694. Despite their rudimentary nature, implementing these facilitated an analysis of the relationship between digital behaviors and beliefs and self-perceived skills and strategy usage. An important caveat is that the informants are assumed to have English skills at a minimum of the B2 level, given the prerequisites for admission to the TEFL course of study. Conclusions drawn from this cohort, especially in terms of items that related to English ability and English language learning strategies, are not necessarily applicable to EFL learners with more or less advanced skills. Especially in terms of strategy usage, other research has shown significant interactions between proficiency and appropriate strategy application (Anderson, 2011, p. 762).

3.2.1.2 Data Collection

This study adopts a quantitative approach, using as a tool a survey administered to the entire cohort of pre-service teachers in EFL at Leuphana University Lüneburg in the fall of 2015. Far from being merely a convenience sample, the choice to focus on pre-service teachers (PSTs) stems from the understanding that digital “identities” can best be understood when the

population is seen in their dual roles as both “users” and teachers (cf. Graham, 2008). The informants are learners whose own experiences in pre-tertiary education have shaped their beliefs, without adequate opportunities to reflect on these in meaningful ways (cf. Legutke, 2003, p. 211; Legutke & Schocker-von Ditfurth, 2003, p. 20). At the same time, the informants are future teachers, who hold beliefs that will shape their students’ encounters with digital technologies for language learning. With a return rate of 68% (n = 150), the survey reflects the composition of the cohort as a whole, with a substantial preponderance of women (86%) enrolled directly or shortly after secondary school ($r(106) = .28, p < .003$), pursuing a course of study leading to certification as primary or early secondary teachers of EFL and an additional subject in general public schools (82%).

The survey, described in detail in the article, consists of eight components, including one on demographic and background information (16 items). The remaining seven sections, with a total of 93 items, use Likert scales, multiple- and single-choice items, and short-answer questions, to pursue information about the PSTs’ past and present digital language learning usages, both curricular and extracurricular, both gamified and game-based, and non-playful. Further questions do not address ICT at all, but focus purely on the respondents’ self-assessed English language skills and language learning competencies. While it is assumed, based on enrollment requirements, that the respondents possess an advanced level of English language knowledge, asking them about their perception of both this knowledge and their use of language learning strategies allowed for a better data triangulation and an examination of the interplay of self-perception, use of digital tools, and attitudes towards these usages.

In order to ensure the validity of the data despite the length of the questionnaire and the myriad constructs addressed, most of the items were adapted from pre-existing instruments, as described in the previous section. Validity testing was carried out on these adapted items and abbreviated scales. Feedback during the piloting phase resulted in the reformulation of misleading items. Individual items were eliminated from the data analysis

when issues with validity post-implementation emerged, as described in the findings. Given the disproportionate number of females to males, analyses evaluated whether the gaming behavior of women is statistically discrepant from that of men, as has been documented to be the case in some studies. In this case, independent sample T-tests conducted on items related to gaming behavior found limited statistical difference in the responses of women to men among the informants. Further analyses in the future may examine this issue more precisely. What follows is a summary of those findings as discussed in the aforementioned article; further analysis of the remaining data will take place in the future.

3.2.2 Findings

3.2.2.1 Pre-Service Teachers as EFL Learners

Given the influence of prior experiences on teachers' pedagogical beliefs and practices, the survey began by examining the informants' own formal experience with digital media in EFL instruction. The results reflect other findings that indicate a comparative dearth of digital usages in German schools (Aufenanger, 2002; Eickelmann & Vennemann, 2017; Fraillon, Ainley, Schulz, Friedman, & Gebhardt; Lorenz, Endberg, & Eickelmann, 2016). The mean usage of 11 digitally-enhanced activities specifically identified for EFL learning purposes ranged from 1.14 (SD = .349) to 1.93 (SD = .563) on 4-point Likert scale (1 = "never;" 4 = "frequently"). Listening and viewing activities, which are generally more receptive skills, had higher mean usage than activities that included writing or research-related components that rely on productive skills, although the items were not all specific enough to identify precisely the role of each in a given activity, such as "use educational software" or "play English-language games." Differences were also found between students enrolled in an earlier semester of study and students with more postsecondary education, potentially indicating a trend toward more digitally-infused EFL in grades 1 through 13.

Recognizing the role of PSTs' personal digital usages in influencing their beliefs and behaviors as teachers, the survey also examined the informants' current EFL-related digital activities and their playful digital activities in both English and German (data regarding other languages was not systematically collected). Although only a few items were included, a principal components factor analysis using Varimax rotation revealed that the responses could be categorized as one of three types of EFL-related digital usage. A comparison of mean frequencies revealed that "reactive" usages were undertaken most frequently, followed by "proactive usages" and "playful usages." This suggests that the informants utilize digital EFL tools to accommodate specific needs but do not systematically engage with digital EFL activities for either educational or leisure purposes, findings that echo research by Hlas, Conroy, and Hildebrandt (2015).

In order to contextualize the informants' playful usage of digital tools for EFL, a comparison with their digital gameplaying activities in German was undertaken. The data reveal differences in frequency both in terms of language (English or German) and as regards device (computer or cell phone), which lends support to research that indicates there are substantial differences in beliefs and behaviors according to ICT type (cf. Šumak, Heričko, & Pušnik, 2011). While the informants are more likely to play digital games on the computer in English than in German, they are less likely to play English-language games on their cell phones than they are to play German-language games on their mobile devices. These findings highlight the need for further research that delves more closely into both the question of which language is preferred, for which activities, and how the affordances of various types of hardware mediate these decisions. Finally, an analysis of the nature of the games played and participation in game-related activities would better illuminate what factors contribute to these differential patterns, as well as how they shape the informants' beliefs regarding DGBLL.

3.2.2.2 Pre-Service Teachers as EFL Teachers

Informants' beliefs regarding the use of DGBLL reflect the triadic model of the adapted TAM, distinguishable according to their perceived usefulness, perceived ease of use, and the learning opportunities they potentially provide, in this case, *vis-à-vis* EFL. These findings align with those regarding non-subject-specific DGBL (cf. Bourgonjon et al., 2013). They do not support hypotheses regarding subject-specific DGBL, which some studies anticipate (cf. Eickelmann & Vennemann, 2017). However, these queries do not specify platform, game type, activities, nor specific skills. Thus, further research might reveal how the nature of specific applications could shape beliefs in various subjects.

Informants' beliefs regarding DGBLL correlate with the other constructs in the survey. There are significant positive correlations between their DGBLL beliefs and their self-assessed EFL skills, language learning strategies, and current gaming behaviors. These are critical findings when considering the role of DGBLL as one component of EFL teacher preparation. A positive relationship between perceived EFL competencies and receptivity towards DGBLL, for example, may help illuminate the heterogeneity of pre-service teachers' EFL skills and learning strategies. Moreover, PSTs' receptivity towards DGBLL gains in significance if a positive attitude towards DGBLL supports (perceived or actual) EFL competencies.

A negative correlation between prior EFL with digital media and current DGBLL beliefs also raises significant issues that necessitate further research. The reasons for the significant negative correlation ($p < .05$) can only be hypothesized, based on existing theoretical and empirical literature. One reason for the negative correlation could be related to their teachers' inadequate TPACK, which itself might possibly be related to the overall low level of digital usage in formal school settings in Germany. Teachers who initiate digital learning in these circumstances represent outliers of some sort, either as innovators or non-traditionally trained educators, for example. This state of affairs could limit their ability to

utilize digital technologies in pedagogically sound and motivational ways. They may have limited access to professional learning communities or efficacious hardware or software. Given the paucity of DGBLL practiced in this context, it is also plausible that the findings are not directly relevant for attitudes towards DGBLL, since one type of digital tool does not necessarily reflect attitudes towards other types of digital tools (Šumak et al., 2011, p. 2076). All of these potential explanations, as well as others, necessitate further research.

3.2.3 Conclusions

Although many of the findings of this study echo previous studies regarding PSTs' beliefs and beliefs about DGBL, especially as they relate to permutations of the TAM, other aspects of the survey highlight important distinctions that require further exploration. The data suggest that the TAM is an appropriate approach for understanding German EFL PSTs' attitudes towards DGBLL. Moreover, the findings establish significant relationships between gameplaying behaviors and beliefs, and EFL skills and strategies. Despite the fact that this data relies on self-assessments subject to different kinds of bias (cf. Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), it nevertheless adds to the emerging understanding of affordances of DGBLL, at least as regards self-efficacy, if not actual competency.

At the same time, the results raise new questions that require more specific inquiries and other types of studies. While the study contributes to an understanding of the types of digital activities German PSTs engage in, the lack of specificity regarding game types and game-related activities makes it difficult to draw conclusions about a variety of issues. A more detailed analysis of the types of games played – both past and present – , ancillary activities engaged in, and the inclusion of other types of hardware would paint a fuller picture of how DGBLL-related beliefs and behaviors are shaped by school experience, influence perceptions of competency, and mediate other digital and EFL-related patterns. Such knowledge not only would contribute to a better understanding of the factors that affect

teachers' adoption of these technologies, but would also contribute to an understanding of the types of PST education needed to cultivate efficacious practices for both their own knowledge development regarding language and language learning, and that of their future learners.

3.3 Study 3: Blume, C. (2019). Playing by their rules: Why issues of capital (should) influence digital game-based language learning in schools. *CALICO Journal*, 36(1).

The third study focuses on the learners, rather than the products or the teachers, although the role of the teachers is critical in this analysis. In this article, the focus is on a theoretical analysis of the foregoing findings. The article pursues the question that emerges from an analysis of dedicated DGBLL and of EFL PSTs' low levels of gameplaying behavior paired with measurable linguistic and metacognitive outcomes among gameplayers. The analysis thus asks what the implications of differential DGBLL adoption might be in terms of access and equity for learners of EFL. Rather than collecting further empirical data, an initial answer to this question emerges from existing frameworks and research. The resulting analysis concludes that (1) habitus informs differential enactments of school-based DGBLL, (2) this differential usage is one component of a digital divide that perpetuates existing inequalities in opportunity and outcomes, and (3) EFL instruction should incorporate gameplay activities to mitigate such inequities.

3.3.1 Methodology: The Evidence for Discrepant Gaming Patterns

The article begins by reviewing the evidence of differential uptake of digital gaming. The empirical data here is unevenly developed. Substantial attention has been directed towards the ways structural hindrances, such as linguisticism, ableism, racism, gender, heteronormativity, and inequalities in wealth, mediate digital access, participation, and outcomes (Ortega, 2017; van Dijk, 2012; Warschauer, 2003). Other than issues of gender, less attention has been paid to digital games and gameplaying in relation to digital equity, but examinations of relevant

aspects are beginning to emerge. Recent literature on the subject focuses on how access and participation to meaningful gameplaying opportunities are shaped by disparities in wealth and education (Koivusilta, Lintonen, & Rimpelä, 2007; Seiter, 2008; Seufert, 2017), ethnicity (Green & McNeese, 2008; Nakamura, 2012; Warschauer & Matuchniak, 2010), sexuality (Nakamura, 2012; Shaw & Friesem, 2016), and special cognitive, sensorial, or physical needs (Bierre, 2004; Bunce, Herbert, & Collins, 2007). Despite increasing attention to these issues, however, research has not as of yet focused on how foreign language learning through, with, and in digital games is an important aspect of digital equity.

Many studies addressing differential digital patterns consider gameplaying to be a primarily leisure activity (cf. Fraillon, Ainley, Schulz, Friedman, & Gebhardt, 2014, p. 22; Li & Ranieri, 2013, p. 205; van Deursen & van Dijk, 2014). That is, when digital usage is examined, gameplaying is distinguished from “capital-enhancing” online activities such as information-seeking, civic participation, social engagement, or training and learning (cf. Hargittai & Hinnant, 2008; Shah, Kwak, & Holbert, 2001). Such approaches demonstrate a lack of awareness of how gameplaying can potentially bridge all of these types of usage. Those authors who do consider the potentially positive contribution of digital gameplaying to the development of various forms of capital in the context of digital divides do not generally focus on foreign language learning (cf. Delamere, 2011; Huvila, Ek, & Widén, 2013; Walsh & Apperley, 2008; Williams, 2006). Researchers who emphasize the potential of digital gameplaying to facilitate the development of multiliteracies, of which multilingualism is a component (cf. Lo Bianco, 2000), only limitedly address issues of access and equity, although they are in some ways implicit in their reasoning (cf. Beavis et al., 2015; Malaby, 2006; Squire, 2008).

Other studies that exist in the context of inequities in gameplaying access and participation do not distinguish among the many types of games, and game-related activities that have potentially differential effects on student learning in formal educational settings.

While some researchers differentiate between, for example, school-based gaming as a reward and gaming as an integral learning activity, most analyses of learning with games are typically absent such details as to which games are used in instruction, for which purposes, and in which ways (cf. Schrader et al., 2005; Takeuchi & Vaala, 2014). Given the evidence in chapter 3.1 regarding the linguistic, pedagogic, and ludic features of dedicated language learning applications, significant differences between these programs and serious games or COTS, in terms of potential educational effects, could be anticipated. Thus, knowing which games are played, and how will contribute to understanding precisely how DGBLL mediates inequities in formal language learning settings.

Case studies of gameplaying often do provide significant information about how specific games are used in instructional settings. However, while cultural attitudes towards DGBLL are often thematized (cf. Chik, 2014, p. 86; Koh et al., 2012, p. 52; Park & Wen, 2016, p. 145; Reinhardt & Zander, 2011, p. 338), only a few studies consider additional sociodemographic factors at subnational levels. Those studies that do take these variables into account have found discrepant play behaviors and attitudes towards gameplay attributable to race, economic status, community wealth, and parental levels of education, but again do not focus on DGBLL (cf. Duggan, 2015; Gurung & Rutledge, 2014; Squire & Barab, 2004). They thus provide an emergent, albeit apparently consistent, empirical basis to assert that gameplaying's fault lines echo the disparities documented in many other educational, digital, and leisure contexts.

In sum, there is increasing research on digital gameplaying and digital divides, but a focus on DGBLL in this context has not yet occurred. Equally absent are examinations of teachers' attitudes and beliefs towards DGBLL. There is a great deal of research on teachers and issues of equity, but analyses of teachers' attitudes and behaviors *vis-à-vis* digital equity are limited. The topic is touched upon by several authors (cf. Dholakia, 2013; Rowan, 2016; Voithofer, 2009; Warschauer & Matuchniak, 2010), but is only addressed peripherally.

Instead, as described in chapter 3.2, most analyses of teachers' attitudes towards digital game-based learning focus on constructs described by the TAM or in light of their TPACK or pedagogical beliefs. Analyses that root these attitudes in teachers' sociocultural milieus are rare, with Kommer and Biermann (2012), Voithofer (2009), and Friedrichs (2015) doing so for generic digital media attitudes for (pre-service) teachers, but not for game-based learning. Yet given the deep-seated nature of such beliefs, understanding their role towards framing DGBLL is critical. As Legutke (1996) points out, teachers are quick to overestimate institutionalized and enculturated restrictions on their teaching practices. However, they are probably likely to underestimate their own cultural biases that contribute to perpetuating traditional practices, to the potential detriment of some groups of learners.

3.3.2 The Role of Habitus and Capital in Attitudes towards DGBLL: Perpetuating Inequities

Bourdieu's notion of habitus serves to explain PSTs' discrepant gaming behavior and their disinclination to value the linguistic capital derived from digital games. According to Bourdieu, habitus refers to individuals' socially and culturally acquired and ingrained behaviors and sensibilities that explain their behavior (Grenfell, 2014). Linguistic capital (among other forms of capital) – encompassing vocabulary, grammar, register, and pragmatic knowledge – is transmitted in, and is necessary for, successful participation in these habitus.

The evidence that the PSTs in question come from a non-gaming habitus derives from their professional, academic, and sociocultural milieus. In Germany, the majority of PSTs (and subsequently, teachers) are from families that have upper-to-middle class social status (Kühne 2006)⁵. Emerging evidence from Germany (Kommer & Biermann, 2012) and the

⁵ Kühne (2006) makes the point that, compared to other academic careers such as medicine and law, teaching is more receptive to entry from working class milieus. However, he concludes that the social background of the majority of pre-service teachers, as well as the perception that a teaching career is an opportunity for upward mobility, perpetuates a middle-class habitus in German schools that actively distances itself from other milieus.

Netherlands (Nikken, 2017) indicates that members of this socioeconomic group, who enjoy comparatively high levels of education, are skeptical of digital media for leisure purposes, which in most superficial analyses, would include digital games.

This reticence towards digital media overall has also been documented among tertiary students, as a group, in Germany. While the acceptance of digital tools (attitudes towards games are not specifically delineated) is generally surprisingly low among this population (surprising in the context of debates regarding “digital natives” and thoroughgoing digital infiltration), PSTs have the second-least favorable attitudes towards digital tools when compared with college students in other courses of study (Schmid et al., 2017, p. 38). Similar results have been reported by Anderson (2001), Cockerline and Nantais (2009), and Kammerl and Pannarale (2007), although none as starkly discrepant as the ones reported most recently.

International data specifically regarding gameplaying among this cohort reinforces the national picture regarding digital media more generally; studies in Singapore (cf. Chen, Lim, & Tan) and the United States (cf. Hayes & Ohrnberger, 2013; Kenny & McDaniel, 2011) attest to the relative disinterest of PSTs to engage in gaming behaviors. Why this pattern persists internationally despite the varying familial and professional status of PSTs in these countries is unclear and requires further analysis. However, the evidence from familial and pre-professional contexts suggests that there is a mismatch between mean national gameplaying rates and the rate of gameplaying among PSTs and practicing teachers. It follows that attitudes towards these activities are equally misaligned, with significant consequences in terms of equity.

3.3.3 DGBLL for Educational Equity

While issues of educational equity have long been a focus of policy and research, a focus on digital equity in educational contexts has only recently emerged in response to rapidly evolving patterns of digital access and usage. According to Gorski (2009), digital educational

equity implies pedagogy that incorporates digital tools in meaningful ways. That this is often not the case is shown by studies (all from the United States) that document the disparate ways in which educators are prepared for, and enact, digital pedagogies in differently resourced instructional environments (cf. Dolan, 2015; Rafalow, 2014; Warschauer & Matuchniak, 2010). Lotherington and Jenson (2011, p. 232) point out that especially in L2 learning, teachers often reject meaningful approaches, including digital ludic ones that reflect authenticity, engagement, and language learning. Yet language instruction oblivious to learners' extramural English language usage invalidates the linguistic capital learners bring to the classroom, excluding them from discourses that provide participatory potential. Teaching English detached from its situated usages, including playful ones, diminishes its authenticity and thus, its ability to contribute to learners' discursive, digital competencies (cf. Kurek & Hauck, 2014).

Given the preeminence of English as a global language and digital media as a communicative mode, foreign language competence and digital access are inextricably intertwined. As Gorski (2005) points out, "current or potential Internet users who do not speak English, or for whom English is not a native language, may find the Web to be a very lonely place" (p. 30). Likewise, according to Hallet and Legutke (2013), foreign language competence is necessary for "full social and cultural participation" as one of those "competencies and skills that have value in a culture, and at the same time provide the basis for critical change" (p. 9). While Hallet and Legutke do not explicitly address digitally-mediated language learning, access to such language learning opportunities as described in chapter 2.2.2 and 2.2.3, and in the article *Playing by their rules: Why issues of capital (should) influence digital game-based language learning in schools*, illustrates how DGBLL can significantly contribute to the development of such competencies and skills.

In contrast, evidence from the first study in this triad demonstrates the limited ability of dedicated language learning applications to foster these outcomes. Juxtaposing their limited

pedagogic, linguistic, and ludic efficacy, as described in chapter 3.1.2, with the wealth of evidence with regard to COTS in these domains makes it clear that limited access to the latter applications limits learners' equitable language learning opportunities. Likewise, the positive interactions between gameplaying and EFL knowledge and metacognitive self-assessment are, not for the first time, highlighted by the results of the second study in this undertaking. The analysis summarized in chapter 3.2.2 shows a measurable, significant difference in these areas of linguistic knowledge between gameplayers and non-gameplayers. These findings reinforce other research that indicates formal DGBLL can lead to better EFL and language learning outcomes for all learners.

3.3.4 Conclusion

The conclusions drawn in this article are necessarily tentative. Complicating the argumentation is the rapidly changing nature and breadth of digital tools and their usages, both in terms of hardware and software. Moreover, shifting notions of class and status are, for the purpose of analysis, oversimplified. Finally, international differences in how these notions of class and status are constructed, and their attitudes towards DGBLL, are minimized. Emerging anecdotal evidence suggests that attitudes towards DGBLL are shifting, with rejection among elites in some Anglo-American settings gaining traction (cf. Jenkin, 2015). Competing influences in Germany, on the other hand, contribute to an unclear picture necessitating complex empirical study. Both of these trajectories are apparently developing independently of emerging trends in other countries, where both EFL and digital competence enjoy radically different status, and where habitus is constructed differently.

Nevertheless, this study illuminates under-examined aspects of both digital equity and DGBLL. While various existing studies attest to the scope and nature of various "digital divides," few have considered DGBLL as a significant opportunity for the development of linguistic capital in this context. Equally limited are studies that consider the role of habitus in

shaping the technology acceptance of PSTs in EFL. This research focuses on DGBLL, not as a leisure activity, but rather, as a significant source of language learning. Moreover, it uses the notion of habitus to contextualize the lack of DGBLL among PSTs among a specific population. Finally, this study argues that these issues, both as regards language learning and digital participation in the twenty-first century, are critically relevant to fundamental questions of educational equity.

4 Discussion and Future Research

While the three studies summarized in the preceding chapter contribute to a better understanding of the products and practices surrounding DGBLL, they also highlight both the limitations of current enactments of DGBLL and the research itself. By utilizing unique methodologies (e.g., playing-research and expert review) on the one hand, and focusing on a unique population (PSTs in EFL in Germany) on the other, the articles shed light on issues that significantly shape both the potential efficacy of DGBLL and its potential adoption in schools.

Given the findings in the first study that highlight the pedagogical, linguistic, and ludic limitations of dedicated language learning games, it becomes clear that further research and development must focus on addressing “the labor intensiveness of content authoring [and] the complexity of linguistic/didactic functionalities” (Colpaert, 2006, p. 479). The discrepancy between current dedicated language learning products and COTS in all of these areas suggests that alternate models that seek to combine educational and commercial approaches may be more successful in addressing these challenges. Moreover, it is apparent that meaningful teacher education for efficacious implementation of DGBLL needs to pay careful attention to developing teachers’ competence in judiciously selecting the appropriate DGBLL tool for

specific audiences and purposes. As one component of TPACK, this skill will be critical in developing equitable DGBLL opportunities in formal educational settings.

It is worth pursuing the question as to whether the limitations inherent in existing dedicated language learning applications have contributed to the behavior and attitudes regarding DGBLL of the PSTs queried in the second study. Experiences with such products, for example, may inform the negative correlation between school-based digital EFL learning and attitudes towards future DGBLL as discussed in chapter 3.2.2. Comparatively positive attitudes towards the implementation of DGBLL in their own instruction in the future is noteworthy in this regard, and is consistent with research that has found differentials between PSTs' knowledge of CALL and their attitudes towards it (cf. Başöz & Çubukçu, 2014; Hlas et al., 2015). An examination of the specific applications the PSTs utilize on a regular basis may provide further insights into the results that suggest a lack of gameplaying behavior on the one hand and a general receptivity towards DGBLL on the other. Likewise, qualitative approaches that incorporate observation of gameplaying processes and reflective occasions might clarify some of the tensions that emerge in the existing data.

The third study in this project uses the lens of habitus and capital to focus on issues of equity in DGBLL. While the initial two explorations do not explicitly contextualize the findings in these terms, it is clear that they contribute to an assessment of how DGBLL may mediate equity. While a comprehensive examination would warrant a re-analysis of the existing data, initial conclusions can be drawn by examining the findings in the aforementioned areas. Lacking pedagogic, linguistic, or ludic sophistication, it is unlikely that the dedicated language learning applications analyzed in this research can adequately supplement or supplant the well-designed instruction available to learners who are more privileged. Taking into consideration the substantial theoretical and empirical research regarding the role of “situated-sociocultural learning” in DGBLL (Gee, 2010), such products in their current iterations are unlikely to generate the foreign language discourse competence

necessary for equitable participation. Here again, it becomes apparent that teacher education must address issues of both practical implementation and critical pedagogy.

Further nuances emerge when the data regarding the PSTs' gameplaying behaviors and language (learning) skills are considered. Here, the evidence is clear that gameplaying of some kind contributes, at the least, to self-perceived competency in both language skills and strategic learning. While testing this self-assessment was beyond the scope of this study, such self-efficacy beliefs are themselves significant. Given the indications that those who do play digital games benefit linguistically and affectively, DGBLL, if instituted differentially, could widen gaps between privileged and marginalized learners. What remains unclear, however, is how these outcomes are mitigated by the platform, application, and language utilized for gameplay.

5 Conclusion

The three studies summarized above and appended as published articles below illuminate various aspects of DGBLL in relation to formal language learning, focusing on applications, attitudes surrounding usage, and issues of access. Driven by an agnostic approach to DGBLL, the studies attempt to dismantle the disciplinary silos that frequently divide DGBLL research theoretically and methodologically. By adapting methodologies commonly used in connection with game design and combining them with approaches to CALL evaluation; by examining the interaction of behaviors and beliefs among a specific population of PSTs in EFL; and by focusing on the implications of differential access on issues of equity, the research extends current findings in DGBLL. Going beyond efficacy studies, the studies contribute to extending research in the area of affordances, considering the applications, the actors, and the access both of these (fail to) provide to learners of EFL.

All three studies generate questions for further research, focusing on additional applications (and types), other populations, and empirical studies regarding access. Even before further research is undertaken, existing data from the first two studies remains to be analyzed. Subsequently, alternative research and analytic methodologies could illuminate issues left underexplored in these articles. Juxtaposed with the dynamic nature of both products and PSTs' understandings of them are the entrenched practices of school-based language learning. Examining these dichotomies in relation to one another can provide more nuanced understandings of how EFL learners and teachers negotiate these virtual and embodied worlds, and allow for a consideration of the implications for teacher preparation.

The three studies, moreover, examine to a greater or lesser degree *English* as a foreign language without addressing the implications of such as foregrounding. While the first study included applications that offered languages other than English, the vast majority offered EFL either optionally or solely. The subsequent examination of PSTs focused specifically on future EFL teachers and their English language learning, knowledge, strategy, and media usage. While individual respondents could identify additional languages of use, the focus was on their prior EFL instruction, their use of digital media in either English or German, and their status as future teachers of EFL. Only in the third study is the centrality of English problematized, and this takes place, even there, peripherally. This is problematic, for both methodological and ethical reasons. CALL research, of which a focus on DGBLL is one component, that trivializes the products and processes of multilingual learners cannot come to understand their cognitive and situated language learning (Sauro, 2016). Ortega (2017) argues that the absence of an ethical-axiological perspective to paradigmatic research on CALL and second language acquisition ignores the critical relationships that exist between language knowledge, digital literacies, and inequities in the “pervasively multilingual” digital world (p. 296). Given the myriad ways in which this bias both reflects and reinforces the centrality of EFL in both digital and analog settings, a future focus must consider the ways in which such a

focus on English in DGBLL mediates the autonomy, agency, and identity of multilingual speakers and learners.

The foregoing research is designed to inform conversations about teacher education without proselytizing about DGBLL. The intention is to provide empirical data and theoretical examinations that contribute to the development of effective approaches to teacher education for contemporary foreign language learning as a necessary competence for social, civic, political, and economic participation. The somewhat sobering conclusions of the first study, coupled with the complexities generated by the data of the second study, and explicated through the lens of equity in the third study, illustrate both the urgency of, and challenges inherent in, developing appropriate content and methods for future EFL educators, regardless of the medium.

In light of the rapidly evolving technological and pedagogical usage of digital media in general and digital gaming in particular, this research contributes to a better understanding of both the potentials and challenges facing both teacher educators and teachers of foreign languages in the coming years. Far from being an addendum to CALL, DGBLL – through ever-greater immersive experiences, the sustained interest in gamification in virtually all areas of daily life, and its alignment with contemporary understandings of language learning – is growing in significance. Language learners with extensive access to, and ever-greater familiarity with, the target language outside the classroom will have substantially different attitudes and instructional needs than those whose primary language contact is mediated by the classroom teacher. The implications necessitate a thoroughgoing assessment of what future language teachers need to be able to accomplish and how they might best acquire these skills. Understanding teacher knowledge of DGBLL through the lens of TPACK provides a focus, but the model requires more illumination in all of its dimensions.

Over thirty years ago, Pederson (1987) implored researchers to stop conducting comparative studies to prove the benefit of CALL over non-technologically-mediated

language learning approaches. Garrett, a decade later (1991), urged practitioners to stop harboring the “fear that the path into the technological jungle is steep and slippery and thus it is difficult to explore it without becoming entrapped” (p. 92). Both of these approaches can be observed in relation to DGBLL. Instead of cultivating these tendencies through deficit-oriented models that capitalize on inadequate knowledge and infrastructure, or through exuberant praise for futuristic capabilities, the emphasis should be on developing and researching effective foreign language teacher preparation that enables educators to select applications appropriately, based on an understanding of specific affordances and an informed diagnosis of learners’ needs, to fulfill specific pedagogic goals that enable the meaningful participation of foreign language learners in the classroom, in the game, and beyond. Achieving this will be the real game-changer.

6 References

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7 Articles

7.1 Blume, C., Schmidt, T., & Schmidt, I. (2017). An imperfect union? Enacting an analytic and evaluative framework for digital games for language learning. *Zeitschrift für Fremdsprachenforschung*, 28(2), 209–231.

An imperfect union?

Enacting an analytic and evaluative framework for digital games for language learning

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Begriffe wie Gamification und Serious Games für computerbasierte Lernanwendungen einerseits, sowie die Einbindung von Unterhaltungsspielen in Wissens- und Kompetenzerwerbsprozesse andererseits stehen exemplarisch für disziplinenübergreifende Ansätze, durch die Nutzung von Spielmechaniken das Lernen zu optimieren. Auch für den Bereich des *Computer-Assisted Language Learnings (CALL)* ist dies festzustellen. Während die bisherige Forschung sich insbesondere mit theoretischen Aspekten einzelner Anwendungen befasste oder in empirischen Analysen sich den (fremdsprachen-)förderlichen Elementen bezüglich einzelner Kompetenzbereiche widmete, stellen Untersuchungen der Charakteristika der Programme sowie Ansätze zur Evaluierung ein Forschungsdesiderat dar. Der vorliegende Beitrag stellt die Prozesse der Entwicklung und Implementierung eines Test- und Prüfinstruments⁴ in den Fokus, das Programme u.a. hinsichtlich ihrer lerntheoretischen Fundierung, ihrer didaktischen Merkmale, der genutzten Spielmechaniken sowie der multi-medialen Gestaltung analysiert. Anschließend folgt die Vorstellung und Diskussion zentraler Ergebnisse der Analyse von 50 gegenwärtig erhältlichen Programmen. Der Beitrag schließt mit Betrachtungen zur Weiterentwicklung des Test- und Prüfinstruments sowie Empfehlungen zur Gestaltung zukünftiger Lernprogramme.

1. Introduction

Despite the fact that digital game-based language learning (DGBLL) has recently emerged as a substantial area of interest in educational research and practice, fueled by a range of pedagogical and pragmatic interests, a significant hindrance to the instructional use of applications results from the extensive range of games available, and the language educator's need to select games consistent with his or her pedagogical aims and the target population's developmental stages, academic skills, attitudinal biases, and available technological resources (cf. Burston 2003). In the absence of explicit information regarding applications' underlying didactic⁵ models, educators and learners are given little guidance regarding the degree to

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4 <http://ludicall.de/sites/default/files/pruefbogen.pdf>. Last accessed 04.09.2017.

5 "Didactic" is utilized throughout this article to describe the "design science" of determining "what to teach and how to teach" (Reusser 1996: 83).

which principles of foreign language learning, as delineated by Ellis (2005), inform the available tools. Moreover, while there has been relatively substantial research on commercial, off the shelf games (COTS) utilized for language learning purposes, there are few outcome-related analyses for dedicated applications. In addition to lingering questions regarding efficacy (Chiu, Kao & Reynolds 2012: E106), the complexity of identifying and evaluating appropriate applications for language learning make it challenging for educators to take full advantage of the range of available game-like programs with potentially significant affordances.

In order to support educators and researchers in appropriately selecting from among the many language learning games currently available, an evaluation framework that includes elements from the fields of foreign language learning theory, media pedagogy, computer-assisted language learning (CALL), digital game-based learning (DGBL), and game design was constructed. The purposes of this tool are to (1) provide guidance to potential users in selecting games that best meet their – or, their language learners' – needs and to (2) enable a systematic evaluation of available digital games for foreign language learning. Hence, this work finds itself in the "research-evaluation nexus" (Levy & Stockwell 2006: 41). It provides a set of descriptive criteria that enable a substantial number of applications to be analyzed with respect to a variety of pedagogical and multi-medial elements. While it does not attempt to determine the quality of the individual programs under review, it lays the foundation for such subsequent examinations.

This paper introduces the tool, and outlines the results of the initial analysis conducted using it, in order to illuminate the educational and gameplay-specific features of available DGBLL. Following a description of the existing research in evaluating CALL and DGBLL, a methodological overview of the evaluation instrument's conception, development, and implementation is presented. The article then presents an analysis of selected results. This data-based analysis facilitates a critical examination of the tool's efficacy and utility for the study of DGBLL.

2. Literature review

Whereas introspective evaluation of CALL programs dates back to the 1980s, research in DGBLL has focused on efficacy evaluation rather than pre-use analysis (cf. Hwang & Wu 2012; McMurry, West, Rich, Williams, Anderson & Hartshorn 2016). As a result, there is, on the one hand, a body of literature that supports methodological and pedagogical analyses of CALL that does not focus on game-based features (cf. Leakey 2011). On the other hand, there are numerous studies examining the acquisition of language knowledge through the use of digital game-

to be broadened to include, for example, autonomous language learning activities. These criticisms echo the concerns of those who focus on DGBL (without the language specification) and who cite the lack of empirically grounded and validated models as a hindrance to meaningful analysis (Mayer, Bekebrede, Hartevelde, Warmelink, Zhou, van Ruijven, Lo, Kortmann & Wenzler 2014: 509). Reeder, Heift, Roche, Tabyanian, Schlickau & Gölz (2004: 256) do not focus specifically on games, but allude to them in their description of more recent generations of CALL software, positing that existing evaluative criteria are inadequate for these newer products designed around contemporary understandings of both language pedagogy and technical design.

2.2 Evaluation of DGB(L)L

Although evaluative tools exist for DGBL, their emphasis differs from those available for CALL in both intent and focus. The construction of evaluation tools for DGBL has focused primarily on identifying relevant design principles (cf. Moreno-Ger, Burgos, Martínez-Ortiz, Sierra & Fernández-Manjón 2008) and on outcome-oriented instruments designed to measure efficacy (cf. Mayer et al: 503).

There are a few models that attempt to provide an evaluative framework for game-based learning (cf. Freitas & Oliver 2006; Carvalho, Bellotti, Berta, Gloria, Sedano, Hauge, Hu & Rauterberg 2015). Designed to be applicable for a variety of subjects and levels, these tools do not focus specifically on the unique features of DGBLL. Sykes & Reinhardt (2013: 150-152) provide a framework for evaluating commercial off-the-shelf games COTS repurposed for language learning. Given that their focus is on commercial games repurposed for learning, underlying language learning theories and principles are not examined. Moreover, the open-ended formulation of the questions lends itself to the in-depth examination of one, but not a range of, potential tools.

Without developing a specific framework, Hubbard (1991: 221) early on identifies two critical issues in analyzing computer games for language learning. Grappling with the question as to what constitutes a game, he advances the notion that a program could be considered a game on the basis of students' intrinsic desire to engage with it. The motivational benefits ascribed to gaming have, in subsequent years, led to substantial theoretical and empirical analysis designed to illuminate this field (cf. Henry 2013; Schmidt, Schmidt & Schmidt 2016). While each of these approaches contributes to a better understanding of "ludic engagement" (Cornillie, Thorne & Desmet 2012: 243), no unifying model exists.

Hubbard's second question is whether the activity in question truly promotes language learning. It is not enough for an activity to be engaging; a "ludic methodology" must incorporate meaningful learning (Lombardi 2012). While issues of learner and teacher fit, as well as appropriateness judgments, play as much of a role as they do in evaluating non-game-based CALL programs, Hubbard emphasizes that the value of language learning activity presented in a game-like manner requires its own analysis of the language skill, content, or competence pursued in the game context.

The evaluation tool presented herein thus seeks to provide guidance as regards these two criteria. The questions in focus here assess the presence of game-like features that, according to existing literature from game studies, facilitate engagement (Arnab, Lim, Carvalho, Bellotti, Freitas, Louchart, Suttie, Berta & Gloria 2015: 397). Moreover, the ways in which the applications facilitate language learning are analyzed in terms of language learning theories and instructional approaches. The tool seeks to provide information about preponderant elements found in these applications. Such a foundation is necessary prior to assessing the quality of specific programs or genres, which has, as of yet, only rarely taken place, although there are exceptions (cf. Feist 2008; Kerres & Bormann 2009; Anyaegbu, Ting & Li 2012; Vesselinov & Grego 2012; Kober, Paland-Riedmüller & Hafner 2015, Vesselinov & Grego 2016a, 2016b; Chalak & Ahmadi 2017). Before the tool itself and the evaluation of games using it are addressed, the research design is described.

3. Research design

This section summarizes both phases of the study, namely the design of a tool for DGBLL evaluation and the application of said tool to existing programs. First, it summarizes the criteria by which tested applications were defined and identified. It then describes the constructs from existing principles and frameworks for evaluating CALL and DGBL that have been adapted to develop a comprehensive tool for DGBLL evaluation. Given space limitations, the focus in both describing the evaluation tool and the empirical results is on the defining characteristics for DGBLL, with a focus on foreign language learning theories and didactic and medial interactivity. The purpose of applying the tool in this study is not to evaluate individual products, but to examine the utility of the tool in use. Moreover, it facilitates the examination of widely implemented features of existing applications, in order to provide some initial conclusions about the characteristics of these programs in light of CALL and DGBL theory.

3.1 Application definition

In selecting applications, the researchers included programs, platforms, and applications that either define themselves as games or that use gamified elements to promote language learning. In the DGBL literature, a variety of terms are used. While commercial games (COTs) are generally considered to be distinct from serious games, games for learning, and synthetic immersive environments (cf. Breuer & Bente 2010; Sykes 2013), virtual worlds may be either commercial products adapted for learning or purpose-built environments (Peachey & Childs 2011: 2). The "use of game design elements in non-game contexts", known as gamification (Deterding, Dixon, Khaled & Nacke 2011: 10), may refer to either commercial or educational applications. While there is thus no consensus regarding what constitutes a "game" (Crookall 2010: 904), or even what to call DGBLL applications (Cornillie et al. 2012: 246), including all of these items assumes that products that identify themselves as games could be evaluated within those parameters and in light of what Deterding et al. (2011: 13) describe as the "socio-cultural trend of ludification."

Recognizing that the boundaries between the programs and their ancillary chats, blogs, discussion forums, walkthroughs, and websites are often nebulous (Karppi & Sotamaa 2012: 414), analysis of the applications includes examinations of these elements as well. This is what, to varying degrees, Consalvo (2007: 21) refers to as "paratexts", Salen & Zimmerman (2003: 431) as the "meta-game", and Gee & Hayes (2012: 130) as "Game". By adopting this approach, a wide net was cast to include a range of learning objects.

3.2 Application selection

The first step involved creating a database of relevant programs. In addition to engaging in Google-based searches, the researchers identified titles based on reviews from generic (i.e. "App store") and specialized DGBL (i.e. www.dji.de/; www.gamesforchange.org/learn/game-databases) websites. Also included were the offerings of language education institutes such as the *Goethe-Institut* and British Council. Despite the lack of verifiability regarding usage statistics, a program's popularity, based on downloads (i.e. www.appannie.com), was considered as one criterion for inclusion. In this initial step, a list of approximately 150 applications was compiled.

It was the goal to survey a range of applications, games, and programs, in order to examine a cross-section of tools on a variety of platforms, and therefore purposive sampling (cf. Teddlie & Yu 2007: 80-81) was utilized. At the same time, it

became clear that there is an uneven distribution of language learning applications among platforms, monetization models, and languages. For example, the most popular delivery method continues to be via browser. Based on these criteria of popularity, language-learning focus, and availability to the public, 50 applications that represented all major platforms, monetization models, game types, and developers were selected.

3.3 Evaluation tool development

Prior to analyzing the existing digital games for language learning, an appropriate evaluative tool reflecting, as per Hubbard (2006: 5), both methodological frameworks and aspects of instructed SLA theory was constructed in a four-phase, recursive process, with special attention given to Chapelle's principles for designing meaningful CALL evaluation (see 2.1 above).

Whenever possible, complex pedagogical or design principles have been operationalized as quantifiable variables. Thus, Hubbard's (1987: 236) descriptor, "provides comprehensible input at a level just beyond that currently acquired by the learner," is concretized in items that analyze the ability of the given program to adapt to a learner's level. However, the complexity of DGBLL cannot be fully captured by unitary measures. Where possible, scales of multiple items generate numeric or averaged values. In cases where this is too reductive, narrative descriptions describe the unique elements of the various applications.

These aspects serve as components of a comprehensive tool that ultimately considers 25 separate elements of DGBLL with 80 items. Complexity can be accounted for by the ability to assign multiple codes and through the provision of open-ended response fields. In some instances, Likert scales with five-point response items are used to evaluate constructs, especially when subjective analysis seems called for, i.e. in determining the degree of immersion or the quality of multimodal elements in individual applications. In this way, both quantitative and qualitative findings could be incorporated into what Hubbard terms a "principled checklist" (Hubbard 2006: 6). The final tool incorporates five categories, three of which are described more fully below. Given that the reported results do not address items in the two remaining categories (background information and user experience), these will be mentioned only briefly in terms of their function in the evaluative tool.

3.3.1 Didactic analysis

Bopp (2006: 10) points out that analyses of DGBL must examine the explicit and implicit learning goals, content, and didactic methods of the application. These items, alongside an examination of the activities, exercises and tasks that contribute to a focus on form, meaning, or both (cf. Chapelle 2001) and feedback types and timing (cf. Shute 2008; Conati & Manske 2009) facilitate an analysis of the underlying pedagogical theory and instructional model (cf. Bopp 2006: 21). While a listing of the content, competencies, and activities of the applications was undertaken before being subsequently coded and categorized, other aspects of the didactic analysis require a more integrated approach. Determining, for example, whether an application is largely behaviorist, cognitivist, or constructivist requires an analysis of multiple items that must take into account not only what is presented, but the ways in which it is presented.

Table 1: Didactic analysis

Didactic analysis	Subcategory questions
Proficiency level	- To what degree does the given proficiency level reflect the actual level?
Pre-test	- Is a pre-test available or required? - Do the results of the pre-test affect the content, sequence, or presentation of material within the application?
Competencies	- Which competencies and skills are addressed?
Content	- What is the content and what themes are found in the application? - In what ways is there an integration of language and content (CLIL)?
Instructional approach	- Is the language conveyed primarily implicitly or explicitly?
Additional support	- What opportunities are there for teachers/parents to adapt content or skill levels; see results; obtain off-line materials; engage simultaneously in the application?
Learning theories	- To what degree are behaviorist, cognitivist, and/or constructivist elements present in the application?
Activity/exercise/task types	- To what degree are closed, semi-open, or open-ended activities integrated in the application? - To what degree are there elements that focus on form and/or on meaning?
Feedback	- What forms of feedback are utilized in the application? - To what extent can the user modify the feedback options?
Quality	- Are errors in content, explanations, language use, or feedback present?

3.3.2 Didactic interactivity

The concept of didactic interactivity draws on the definition of Strzebkowski & Kleeberg (2002: 232), who refer to it as those active interactions in educational software that directly support cognitive processes. Strzebkowski and Kleeberg differentiate between interactivity of design elements (*Steuerungsinteraktivität*) and didactic interactivity (*didaktische Interaktivität*), giving as examples of the latter the ability to influence animations, models, and simulations; input complex responses to complex queries; modify the content or progression; create new multimedia objects; utilize an electronic notebook; take advantage of adaptive feedback and help (ibid.). Macro- and micro-adaptations based on the proficiency level of the user and customized with the appropriate amount of scaffolding an individual learner requires create personalization (cf. Leutner 2002), evaluated by queries that examine how the application changes based on the apparent proficiency of the user.

Table 2: Didactic interactivity

Subcategory	Question(s)
Customization	<ul style="list-style-type: none"> - How does the application adapt to the user, either through active selection or passively through user behavior? - How does the application adapt to the user in terms of content, level of difficulty, learning style, or other characteristics?
Personal profile	- How is data about the user utilized to adapt the application in terms of content, presentation, or gameplay?
Scaffolding	- What is the nature of support to users in terms of content and gameplay?
User-created material	- To what extent does the application facilitate the integration of user-created material?

While the notion of what constitutes adequate adaptivity is based on a subjective determination, multi-layered analyses of how an application accommodates the users generates a descriptive measure of the application. Thus, while one application might incorporate a pre-test that affects the subsequent level of the material to be learned, another might automatically adapt to the user's behavior to alter the content presented to the learner.

3.3.3 Game-based characteristics

In this category, the examination of game-based features is brought into focus. While Sicart (2008) defines game mechanics as "methods invoked by agents for

interacting with the game world", giving as examples "climbing, jumping, stabbing and shooting", Arnab et al. (2015: 397) list both the aforementioned as well as more concrete and bounded items as tokens, rewards, and goods, and furthermore *gameplay* mechanics, such as levels, competition, and infinite play. The questions in this category accommodate both definitions.

Queries were generated to determine whether learners have the opportunity or are required to utilize critical thinking skills, based on a revised Bloom's Taxonomy that adapts the original hierarchical model of cognitive activities to reflect their process-oriented nature (cf. Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths & Wittrock 2001); whether the application's language learning activities are wholly or partially embedded in a narrative environment (cf. Ritterfeld & Weber 2006); and the nature of the generated outcomes. This is further delineated into subqueries, i.e. in the case of higher-order thinking skills, it is necessary to assess the degree to which activities potentially facilitate critical thinking as previously defined; to distinguish whether they are thoroughgoing, partially present, or absent; and to determine the degree to which the user is required, encouraged, or enabled to engage in these activities. A similar process is then necessary for the other elements, i.e. regarding the degree to which a narrative exists and the extent to which the narrative is integral to the language learning activities and goals. Finally, the rewards and goals require definition, and an analysis of their relevance towards the thinking skills, narrative, and language learning activities and goals is necessary (cf. Arnab et al. 2015).

Table 3: Game-based characteristics

Subcategory	Question(s)
Game genres	- Is there a narrative (story) underlying the application? - What game genre does the application belong to?
Game mechanics	- What game mechanics are present?
Game elements	- What game elements are present? - What do the users "do" in the application?
Social mechanics	- What social mechanics are present? - What are the functions of the existing social mechanics?
Real-world connections	- To what extent does the application make connections to the real world?

Evidence that both narrative and interaction, and especially their interaction, facilitate language learning informs both sociocultural theories of language learning and analysis of DGBL, highlighting the significance of social mechanics in DGBLL (cf. Reinders & Wattana 2011). The evaluation thus further includes items that address the question posed by Consalvo (2011: 188): how do games implement social interactions into their gameplay, to what purpose?

3.3.4 Background and user experience

While data regarding program specifications (version, platforms, monetization model) and user experience are gathered, these are not discussed further in this article. Although these categories are important, they are not examined for two different reasons. On the one hand, the collected background information, with one exception, does not provide further information that helps evaluate the pedagogic usefulness of the applications. On the other hand, in its role in shaping the user's options for interacting with the interface and the game world (Saltzman 2000: 261), user experience is closely related to the adaptivity required for effective didactic interactivity (Hochleitner, Hochleitner, Graf & Tscheligi 2015: 199), so that there exists overlap in these categories. It was thus decided to avoid repetition by focusing on those elements most closely related to issues of DGBLL (i.e. didactic analysis, didactic interactivity, and game-based mechanics).

Given the complexity of analyzing the effective utilization of multimedia elements for language learning, a substantial number of individual items in the remaining three categories – didactics analysis, didactic interactivity, and game-based characteristics – are addressed via Likert scales. This allows for analysis of the topic's breadth and the evaluative stance necessary for a meaningful analysis.

3.4 Implementation processes

In the second phase of development, the survey's reliability was tested. While the large number of qualitative items in the survey made a global correlation of inter-rater reliability impractical, collaborative coding of various game elements facilitated consistent analysis. To more adequately address the transdisciplinary nature of the tool, a manual was designed to accompany the checklist, elaborating on the underlying constructs and providing selected examples. A recursive dialogue further clarified queries and responses to heighten consistency among raters. In the final pilot phase, the testers completed game tests together, subsequently acting as "critical player-theorists", as described by Aarseth (2014: 181), as a form of action research (cf. Karppi & Sotamaa 2012).

Hubbard (2006: 1) notes that one obstacle to evaluating early CALL software arises from the fact that these applications do not generally enable the evaluator to "skim" the program, but rather, necessitate the application to be tested in its entirety, a challenging task given the complexity and number of available options in these programs. This is even more so the case with digital games, with their multiply branching options (Burston 2003: 35) Thus, the selected digital applications were "played" several times, in order to reveal the affordances the program offered for various learning pathways. This approach simultaneously offered the

opportunity for multiple testers to analyze each application and thus enhance inter-rater reliability.

In the following section, selected results derived from the implementation of this evaluation tool for these 50 items are presented. While substantially more data was collected, the focus on these aspects allows for initial conclusions to be drawn about these features of DGBLL as well as the evaluation framework's usage and limitations. Both of these outcomes will be discussed in the subsequent discussion, leading ultimately to the identification of areas for further research.

4. Results

Based on the evaluation tool that was developed and implemented as described above, the analysis of 50 language learning applications was able to highlight common patterns and structures. While this examination is not comprehensive in terms of available applications, the trends identified in the aforementioned areas are indicative of the types of gamified educational programs currently available for language learning purposes. Given the relatively small sample size, numerical and correlational data are tentative, requiring further exploration, and are thus not reported here. The results do not encompass all of the collected data, but rather, focus on those items that are most pertinent for understanding the potential and limitations of current DGBLL. In particular, the selected results included here focus on the degree to which theories of DGBL, CALL, or language learning acquisition inform these applications.

4.1 Didactic analysis

The data suggests that the majority of DGBLL utilize behaviorist techniques to facilitate the acquisition and reinforcement of receptive competencies for learners who are beginning learners. The determination as to whether an application incorporates largely behaviorist or constructivist methods is not made on the basis of any one element, but rather, reflects an analysis of a variety of features regarding content, feedback, collaborative and cooperative opportunities, use of multimedia and authentic materials, and scaffolding.

Notable is the emphasis on receptive, over productive, skills, as indicated in Figure 1.

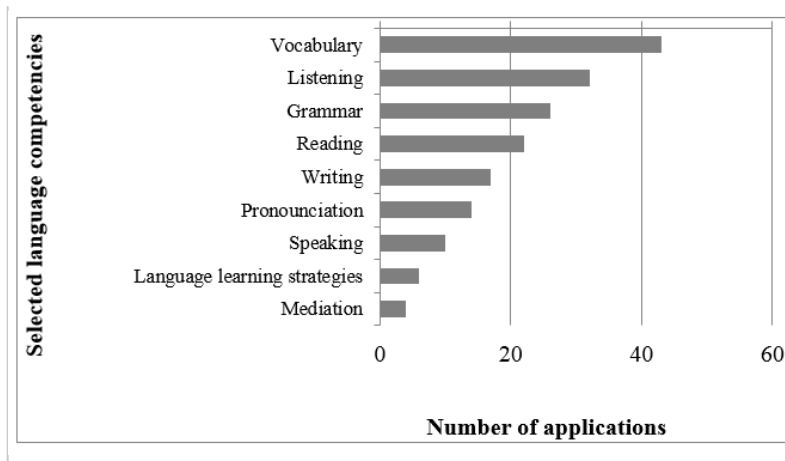


Figure 1: Language competencies

Of the 50 programs, 86% (43) incorporate or focus exclusively on the acquisition or recall of lexical items. These are most frequently proffered explicitly, as discrete terms with limited contextual embedding. While 64% (32) of the programs incorporate listening tasks, none enable learners to submit a free response in response to an audio prompt. Instead, comprehension of audio input is evaluated through closed items. Likewise, there are no applications that incorporate both speaking activities and constructivist elements. In the majority of applications, exercise-like activities predominate, as indicated in Figure 2.

The majority (86%) of applications utilize closed formats, although some construct these in ways that mimic open-ended activities by requiring learners to carry out a command or complete a task. In the application *Islands*, learners practice prepositions of place, moving a character *in front of*, *behind*, or *next to* a given object. Such tasks integrate the primarily behaviorist learning task into the game world. Other programs, however, do not achieve this interplay. *English Attack* is an example of such a program.

By typing in the correct forms of irregular verbs, players are able to have their character, a comic-type animal, win a race. The connection between the content and the game is not evident.

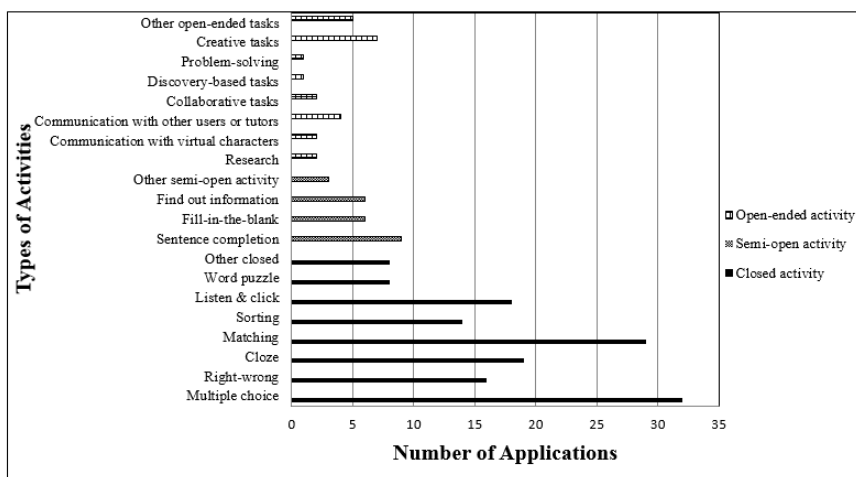


Figure 2: Activity types

Although half of the applications allow the user to choose the order in which to complete the given exercises, other elements that consider the program’s adaptivity demonstrate that the majority of the language learning programs favor behaviorist instructional methods.

Table 4: Behaviorist elements

Element	Drill & practice	Pre-determined order	Pre-determined content	Immediate feedback	Repetition until correct
Percent	86%	50%	82%	86%	84%
Number of appl.	43	25	41	43	42

These elements are strongly informed by game mechanics. In all of the aforementioned cases, learners receive points, move up on a leaderboard, collect a bonus, or receive praise for correct responses, while incorrect responses are penalized accordingly.

The preeminence of behaviorist elements, while potentially a result of game design issues, is likely further influenced by the absence of foreign language learning specialists in the design and evaluation of the given programs. Given how much theoretical and empirical data exists regarding language learning and acquisition, an assessment of the degree to which this existing research informs available applications provides some indication of their alignment with these research-based principles.

The majority of the reviewed applications do not indicate any formal or informal associations with researchers or institutions of language learning. 42% (21) of the applications were developed with apparent input from experts in the fields of second language education, emerging from a cooperation with an academic institution, such as the *Goethe-Institut* (6%), as products of textbook companies (8%), or in collaboration with an academic in linguistics or a related field as a primary author (6%). This is not to say that the remaining 58% (29) do not reflect the expertise of academics in language acquisition, but their input in these cases is not apparent or cannot be ascertained. While the presence or absence of academic input or reviews does not, in itself, determine the nature of these products, it does suggest that knowledge of language pedagogy may be constrained. This assessment is reinforced by the apparent finite language knowledge of the producers, with 32% (16) of the applications revealing linguistic errors.

4.2 Didactic interactivity

While an analysis of the underlying didactic method overlaps to some degree with the concept of didactic interactivity, the focus in the former case is on using the presence or absence of interactive elements to form a description of the underlying learning theory. The emphasis in examining the latter case is on the ways in which the application facilitates learner autonomy (cf. Jones, Stuhlmann & Zeyer 2016).

Only 12% (6) of the applications collect data or conduct a pre-test to assess users' pre-existing language skills and adapt instruction targeted to their level of ability. Of these 6 applications, half (3) automatically select a level for learners to begin within the program. For the remainder, the learner is directed to make a selection regarding the subsequent level of difficulty based on these results, but is free to choose otherwise. None of the applications automatically change the level of difficulty based on the user's responses; repeated playing results in the same set of items. While the sequence of items might vary through repeated attempts, there is no indication that this correlates to an analysis of the item's difficulty for the individual user or to a standardized assessment of the item's level of challenge (i.e. via word lists or order of introduction for grammar items).

In addition to selecting the level of difficulty, users can select, in 30% (15) of the applications, from several available topics or create their own input. For those applications in which the content is predetermined, the topics are arranged according to the level of difficulty, so that a beginning learner, for example, who chooses to focus on content related to "dining out" will necessarily have to select more challenging input, at least based on the application's assumption of what consti-

tutes more sophisticated language. Despite branding the levels in terms of increasing difficulty, in many cases, what changes are simply the vocabulary words; other linguistic competencies and activities and tasks do not noticeably change to reflect greater facility with either the language or the gameplay. None of the applications have the ability to accommodate individual preferences regarding learning styles, prior gameplay experience, or personal interests.

Feedback in the majority of applications is focused on closed or semi-closed items. While users can select, 16% (8) of the time, whether they want acoustic signals (available in a total of 50% of the programs) in addition to visual reactions (80% of the programs), they cannot otherwise adapt the type, depth, or timing of the feedback. In 10% (5) of the applications, learners can click on the feedback to indicate they want more information. However, in none of the cases does the elaborated feedback address learner errors beyond a standard correction (i.e. "Here is how to spell brother ") or statement of a rule (i.e. "The present participle is created with a form of *to be* + *-ing*").

The few programs (8%; 4) that provide feedback to open-ended items do so either through peer-learning structures or with the help of human tutors; in these cases, input and feedback are asynchronous. Despite the fact that one program advertises large user communities who can respond to requests for feedback virtually instantaneously, requests for feedback from multiple peers were ultimately left unanswered in 80% of the cases.

4.3 Game-based characteristics

The majority of the tested applications utilize a narrow range of common game mechanics and attributes. These most frequently found elements tend to emphasize discrete units of achievement with limited interactional quality.

The most commonly utilized mechanic is the use of points that are accumulated over the course of play. Also frequently found are progression indicators, status rankings, or opportunities to "level up". One or more of these mechanics could be found in 90% of the programs examined, as indicated in Figure 3.

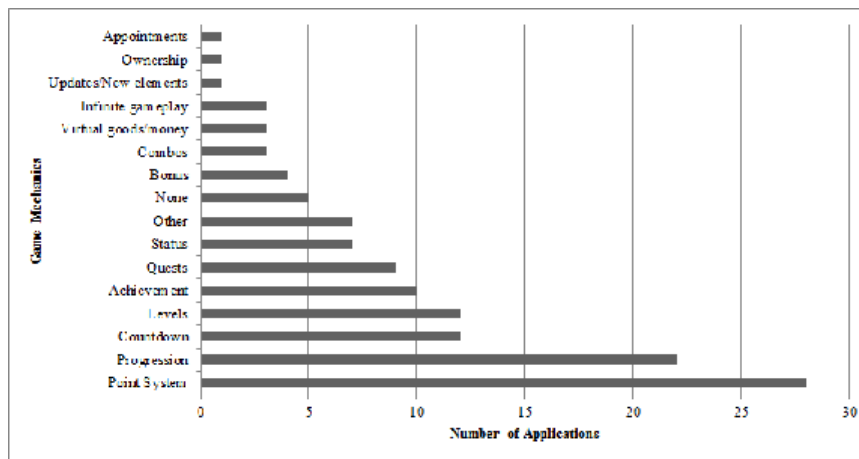


Figure 3: Game mechanics

These game-based rewards are used to both frame feedback and, theoretically, enhance learning, despite the questionable efficacy of doing so (cf. Abramovich, Schunn & Higashi 2013; Hughes & Lacy 2016)

Applications that utilize implicit rewards as a means of giving feedback are much less common, present in only 10% (5) of the applications. In these cases, the learner is not given an indicator of "right" or "wrong," but rather, consequences that indicate the (in)accuracy of the given response. In *Daumerlings Wanderschaft (Tom Thumb's Journey)*, for example, the character's rapid demise suggests a false choice has been made.

5. Discussion

The proliferation of DGBLL would suggest that there is a wide variety of available applications that meet the varying needs of different types of learners. While the data indicates that there is, indeed, substantial variety among applications as regards, for example, narrative development, other indicators of variety and thus, appropriateness for unique learners, are largely absent.

The majority of DGBLL in the sample share common features that belie the impression of variety created by the sheer number of available applications. The vast majority consist of simplistic content, behaviorist methods, and straightforward game mechanics, which reinforce one another to construct programs that largely target the receptive, lexical proficiencies of beginning language learners. Combined with straightforward rewards systems and intuitive gameplay, these programs are promising as tools for engaging students in opportunities to practice.

However, programs that combine complex linguistic content and simulation-like play, narrative or inquiry that stimulate exploration or creative application are found infrequently (cf. Göbel, Wendel, Ritter & Steinmetz 2010).

Although the accumulating evidence suggests that those applications that create flow are most effective in terms of both affective and cognitive gains (Kiili, Freitas, Arnab & Lainema 2012), it apparently remains a design challenge to achieve this interplay. Many of the DGBLL address the challenge of incorporating academic content with gamification by, simply, not connecting them. Instead, the gamified aspects of the program serve as a reward for skills achieved, or as an incentive to practice a skill, regardless of the fact that such mechanics may be counterproductive in certain contexts (Landers 2014: 753).

6. Conclusion

The goal of this study was twofold. Initially, the aim was to develop a tool that could be utilized to evaluate dedicated DGBLL applications. Subsequently, the tool was applied to evaluate existing DGBLL. Conclusions from both components of this undertaking highlight the challenges with evaluating and designing DGBLL.

Despite a relatively narrow focus on games and gamified learning programs designed specifically for CALL, innumerable variations in design and pedagogy, and the interaction between the two, highlight the complexity of analyzing these products. While this evaluation tool offers a framework for considerations of DGBLL applications, more work needs to be done in order to guide potential users more precisely in their selection of appropriate tools. The tool itself likewise requires further testing and implementation, both to more fully assess its validity and to test its conclusions with a larger sample. Narrowing the focus, on the one hand, to certain types of applications, will validate trends already described here. Expanding the focus, on the other hand, and utilizing the tool with, for example, commercial products (COTS) will facilitate comparative analyses.

Despite the development of CALL theory from behavioristic to more integrative approaches, the majority of available games reflect the same activities and formats found in early CALL. Roche's (2003) analysis that technological advancement has led to pedagogical regression continues to be borne out. These dressed-up drills have many advantages for autonomous learning. What they cannot do is simulate the dense intertwining of linguistic and pedagogical knowledge of effective language educators in interactive, communicative language classrooms.

Ultimately, applications that emphasize authentic skills over isolated ones and

that embed tasks in sophisticated game structures and enable collaborative game-play will be better able to engage both serious learners and enthusiastic gamers. Going forward, the goal for language learning games is to find the skilled match-makers who can marry these complex language tasks with such sophisticated game mechanics.

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7.2 Blume, C. (2019). Games people (don't) play: An analysis of pre-service EFL teachers' behaviors and beliefs regarding digital game-based language learning. *Computer Assisted Language Learning*, 32(1), nn.



Games people (don't) play: An analysis of pre-service EFL teachers' behaviors and beliefs regarding digital game-based language learning

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ABSTRACT

Despite the prevalence of digital gaming as a leisure activity and research attesting to the affordances of digital game-based language learning (DGBLL) for English as a foreign language (EFL), the use of DGBLL remains low, especially outside the United States. A survey was carried out in order to understand both the beliefs and behaviors of pre-service EFL teachers in Germany regarding DGBLL. Utilizing constructs from a variety of instruments, students were asked about their prior experience with digital media for language learning, their perceived language skills and language learning strategies, their digital game playing behaviors, their digital language learning behaviors, and their beliefs regarding DGBLL. The results demonstrate that the cohort engages in limited DGBLL despite holding generally positive beliefs about the activity. While favorable beliefs were found to be inversely related to prior experience in formal school settings, current engagement in game playing affects perceived English language skills and language learning strategies positively. These findings have significant implications for EFL teacher education as regards DGBLL and further illuminate the habits and attitudes of so-called "digital natives."

KEYWORDS

Digital game-based language learning (DGBLL); computer-assisted language learning (CALL); pre-service teachers; beliefs

Introduction

With the popularity of digital gaming documented across virtually all sociodemographic subgroups (ESA, 2015; Feierabend, Plankenhorn, & Rathgeb, 2016), the potential of digital game-based language learning (DGBLL) has been an increasing focus of research. This interest can be attributed in part to the prevalence of English, both in online and offline contexts (Bruthiaux, 2003), and especially, in the area of digital gaming (Chik, 2012, 2013; Sylvén & Sundqvist, 2012). However, despite the

substantial body of literature attesting to the affordances of DGBLL (Chen, Tseng, & Hsiao, 2018; Kao, 2014; Reinhardt, 2017), there has not been a parallel uptake of digital gaming activities in formal language learning settings, and digital game playing remains virtually unknown in public schools in Germany (Bos et al., 2014; Grüling, 2016). Although the reluctance of EFL teachers to adopt digital technology has already been explored (Burston, 2014b; Gilakjani & Leong, 2012), an explicit focus on their use of, and beliefs regarding, DGBLL is largely underrepresented.

In light of both the popularity of digital games, and the promise they hold for learning, the focus of this study is on EFL pre-service teachers (PSTs), who not only serve as gatekeepers to technological educational change (Hubbard, 2008), but who are themselves also so-called “digital natives” (Prensky, 2001) and, moreover, EFL learners. This survey of their behaviors sheds light on how they use digital media, and specifically DGBLL, for language learning. This examination of their behavior in terms of digital media usage for their own language learning, their beliefs regarding DGBLL for future instruction, and the ways in which these inform their perceptions regarding their English language competencies and language learning strategies, will contribute to the research into acceptance of DGB(L)L and identify issues for teacher education. This research thus addresses the following questions:

- What beliefs do EFL PSTs hold regarding DGBLL?
- What are the pre-tertiary digital language learning experiences of current EFL PSTs, and how do these shape their beliefs regarding DGBLL?
- In what ways do EFL PSTs utilize digital media for their own language learning?
- How does EFL PSTs’ game playing behavior shape their perceived language skills and language learning strategies?

The article begins by reviewing existing research into EFL (pre-service) teacher acceptance of information and communications technologies (ICT) and DGBLL before examining the research on computer-assisted language learning (CALL) in terms of language skills and language learning strategies. After describing the instrument and population that are the focus of this survey, selected results examining behaviors, beliefs, and the interaction of DGBLL and perceived English and language learning skills will be presented before being considered in relation to one another. The article will conclude by identifying necessary next steps, in

light of both the survey's limitations and the presented findings, as regards EFL teacher education.

Literature review

EFL teachers' beliefs regarding ICT

Despite research documenting the affordances of CALL (Grgurović, Chapelle, & Shelley, 2013), technology uptake in EFL appears to be slower than in other subject areas (Eickelmann & Vennemann, 2017). In order to understand this discrepancy, Ertmer (2005, p. 28) argues, it is imperative to understand how teachers believe technology will facilitate the translation of their pedagogical beliefs into classroom practice. While this has been done for other areas of ICT uptake in relation to EFL, such as computers and the Internet in general (Albirini, 2006b; Aydin, 2013; Li & Walsh, 2010; Nim Park & Son, 2009), interactive whiteboards (Schmid, 2006), mobile assisted language learning (Burston, 2014a; Hsu, 2013), and extracurricular CALL (Lai & Gu, 2011), there are few examinations of teachers' receptivity towards DGBLL.

Technology Acceptance Model (TAM)

One of the most widespread approaches to understanding teachers' beliefs regarding ICT has emerged from prior research into activity theory, most notably the Technology Acceptance Model (TAM) (Davis, 1989; Teo, Lee, & Chai, 2007), which has also been utilized as the basis of several studies focusing on educators' attitudes towards non-subject specific digital game-based learning (DGBL) (Bourgonjon et al., 2013; Ibrahim, Khalil, & Jaafar, 2011; Idris, Sin, & Ya'u, 2015). Only recently, however, has the TAM been applied to try to understand EFL teachers' beliefs. Liu, Lin, and Zhang (2017) found differences in attitudes towards ICT usage among Chinese EFL teachers based on pre-existing constructivist or transmissive beliefs regarding student learning. Hsu (2016) ascertained, using a subject-specific tool developed by Baser, Kopcha, and Ozden (2016), that technological pedagogic content knowledge (TPACK) significantly affects EFL teachers' perceptions regarding ease of use and usefulness, two key constructs of the TAM, for mobile assisted language learning. Given that knowledge is distinct from beliefs (Calderhead, 1996), and that attitudes towards use vary by technology type and language competency (Jin, 2017; King & He, 2006; Lai, Hu, & Lyu, 2017), it remains to be seen as to whether the same relation between knowledge and beliefs exists as regards DGBLL.

While the TAM, which sees perceived complexity, perceived usefulness, and learning opportunities as mediators of behavioral intent (Bourgonjon et al., 2013), has been applied in a range of settings, its predictive value has not gone unquestioned. Although Eickelmann and Vennemann (2017) conclude that the TAM is valid in three European countries, other researchers (McCoy, Everard, & Jones, 2005) question implicitly or explicitly whether this approach adequately takes into account existing beliefs that inform technology-related behaviors in specific sociocultural (Albirini, 2006a; Beavis et al., 2014; Belland, 2009; Hsu, 2013; Morton & Jack, 2010) and educational settings (Ertmer, 2005; Windschitl & Sahl, 2002).

EFL PSTs' beliefs towards DGBLL

Although there is substantial research that focuses on the factors influencing EFL teachers' attitudes towards technology, as previously described, studies with a focus on the beliefs of EFL PSTs and teachers towards DGBLL are less common. De Grove, Mechant, and van Looy (2010) focus on experts of e-learning, a subset of whom identify specifically as experts in CALL, to examine receptivity towards serious games for DGBLL. The authors found generally positive attitudes towards DGBLL, but substantial disagreement as to what receptive competencies or skills can best be targeted in DGBLL, whether serious games can provide appropriate complexity and feedback, and whether productive speech can be trained in light of current automatic speech recognition technologies.

These findings presage the few studies that have been conducted with PSTs and teachers of EFL. Foreign language PSTs indicate general receptivity towards DGBLL usage in their own classrooms after game-based interventions, citing both linguistic and motivational aspects of games (Alyaz, Spaniel-Weise, & Gursoy, 2017; Chen, Chen, Chen, & Yang, 2012; Kruk, 2017). However, the participants continue to hold reservations regarding the use of DGBLL, questioning the ability of learners to balance their engagement with their language learning aims, the challenge of selecting linguistically appropriate games, and the limitations of games in terms of productive skills.

Similarly, additional studies have determined that EFL instructors' receptivity towards DGBLL is shaped by their prior experience with gaming. Demirbilek, Yilmaz, and Tamer (2010) found current use and game-based features mediate usage to inform attitudes towards pedagogical implementation among post-graduate level second language educators. Chik (2012) focused on the ways in which gamers (both teachers and non-teachers) identify the learning that takes place during English

language gameplay. While the majority of the teachers in her sample reject DGBLL, the attitudes of those teachers who have prior experience with commercial games more closely reflect the opinions of the gaming students. They identify potential language learning affordances, although their understanding of multimodal gaming practices in English is limited. Chik (2011) points out that prior personal experience alone is thus helpful, but often inadequate, to cultivate teacher receptivity towards DGBLL.

Language skills and language learning strategies

A number of studies have documented the impact of DGBLL on language skill and language learning strategy development in foreign language learning. Given the difficulty and complexity in measuring linguistic competence, a myriad of approaches and foci, both quantitative and qualitative, have been undertaken (Neville, Shelton, & McInnis, 2009; Peterson, 2016; Ranalli, 2008). However, it is less clear whether EFL learners' *perceptions* of their skills are shaped by, or shape, their ICT usage, with the few available studies employing the concept of self-efficacy (Rachels & Rockinson-Szapkiw, 2017) or attitudes towards foreign language learning (Öz, 2015; Rahimi & Yadollahi, 2011) to analyze this relationship. Zheng, Young, Brewer, and Wagner (2009) found that students who played an interactive educational game had higher self-efficacy for EFL in relation to non-players. Several researchers have demonstrated that there is a correlation between non-native speakers' perceptions of their language skills, and the types of language technologies they utilize, and how they use them (Jin, 2017; Li, Snow, Jiang, & Edwards, 2015). While these populations differ from those of EFL learners, it is likely that there is a similar relationship between self-perceived English skills and types or purposes of technology usage.

Various studies have examined the way in which CALL can enhance strategic language learning, focusing on the use of specific behaviors (Park, 2012) or specific tools (Bull, 1997). Respondents in Lai and Gu's (2011) survey, for example, indicated using a range of ICT to regulate and monitor their language learning, and ESL and EFL learners in Anderson's (2003) survey engage in a range of metacognitive strategies to enhance comprehension of online texts. Hung and Higgins (2016) illustrated how learners used different communicative strategies in text-based vs. video-based synchronous computer mediated communication. While Vinther (2005) finds that the use of CALL contributes to enhanced strategy application, other studies have focused on the positive relationship between strategy usage and both proficiency and self-efficacy (Forbes & Fisher, 2018; Rao, 2016). Increasingly, educational games and

gamified applications have been included in these analyses of strategic learning. Peterson (2006, 2012) and Schwienhorst (2002) found that learners used a variety of interactional strategies in their chats in a virtual world and in a massively multiplayer online role-playing game. While research in the context of DGBLL is just beginning to emerge, the given findings provide further indications for a positive relationship between language learning strategies and proficiency.

The study described below focuses on PSTs' beliefs regarding DGBLL. While the survey in this study draws on concepts from the TAM, it also integrates queries relating to EFL teachers' perceived language knowledge, language learning strategies, and prior and current experience as learners with ICT for language learning in order to identify relationships among these constructs. As described in the following methodology, it thus both extends previous studies regarding teachers' acceptance of DGBLL and narrows it down to focus on a specific school subject. Finally, it looks at these constructs in relation to the situation regarding digital integration in German schools, thus establishing a cultural context for the experiences and beliefs of the aforementioned population.

Methodology

The survey, designed to capture EFL PSTs' behaviors and beliefs regarding both language learning and DGBLL, draws on constructs and questions from several previously validated surveys on these topics, in order to explore possible relations between them (see Table 1). At the same time, adaptations to these instruments facilitate a focus specifically on English, EFL, and DGBLL. Using these pre-existing items allows for the incorporation of a range of items on all of these topics to enhance reliability, despite the disparate concepts that are incorporated.

Sample

The survey was administered to a convenience sample of all 220 students studying Teaching English as a Foreign Language at the Leuphana University in Lüneburg, Germany. With the option of submitting the responses either online or via an identical paper-pencil version, a return rate of 68% ($n = 150$) was achieved. The majority of respondents indicated pursuance of an undergraduate degree for teaching general primary or secondary school (82%) and the remainder (16%) vocational school. It is important to note in the context of the highly stratified, yet rapidly

Table 1. Instruments, constructs, adaptation, and question types.

Instrument/Authors	Construct(s)	Adaptation	Question type
International Computer and Information Literacy Study (Bos et al., 2014)	Digital media usage	Focus on usage in EFL class pre-tertiary (13 items)	Likert scale measuring frequency (1–4)
Strategy Inventory for Language Learning (Hsiao & Oxford, 2002)	Language learning strategies	Memory (1), Meta-cognitive (3), Social (3), Compensatory (1) Strategies	Likert scale measuring frequency (1–4)
Common European Framework of Reference (Council of Europe, 2001)	Language competency	Descriptors at the B2-C1 level (20 items)	Likert scale measuring agreement (1–5)
Technology Acceptance Model/Unified Theory of Technology Acceptance & Use of Technology (Bourgonjon et al., 2010; Davis, 1989; Venkatesh, 2000)	Perceived usefulness; perceived ease of use; learning opportunities	Reworded to focus only on DGBLL (10 items)	Likert scale measuring agreement (1–5)
Technological Use Profile (Author)	Current digital usages related to EFL and/or DGBLL	(12 items)	Likert scale measuring frequency; open-ended items to name specific applications and devices
Demographic information (Author)	Age; semester of study; prior language and teaching experiences	(20 items)	Single and multiple-choice items; open-ended responses

changing German educational system, that the cohort does not include future teachers of college-preparatory *Gymnasien*.¹ The majority of participants (86%) are female. This is a higher percentage than in German public schools in total, in which 72% of the teachers identify as female (Statistisches Bundesamt, 2018a). It is also higher than the national distribution of students studying English, which is 71% female (Statistisches Bundesamt, 2018b).

Instrument

Given the influence of prior educational experiences in shaping the behaviors of teachers (Borg, 2003), the cohort was asked about the frequency of digital media usage for language learning in their own schooling, with 11 items modeled on those of the International Computer & Informational Literacy Study (ICILS) (Bos et al., 2014). Both tools and activities were listed on a 4-point Likert scale ranging from 4 = “Frequently” to 1 = “Never.”

While measuring the participants’ actual English language skills was beyond the scope of this study, the informants were asked to evaluate their own perception of both their skills and strategy usage. For the former, a Likert scale (5 = “strongly agree;” 1 = “strongly disagree”) with 20 items was developed utilizing descriptors taken from the B2–C1 level of the Common European Framework of Reference for Languages (Council of Europe, 2001) and thus reflecting the expected language level of incoming students according to the admissions requirements of the university. For the latter, a selection of items from the Strategy Inventory of Language Learning (Hsiao & Oxford, 2002) was utilized to evaluate the cohort’s knowledge and use of language learning strategies. Length constraints indicated a reduction of the entire inventory to 8 items and the same Likert scale.

A subsequent section constructed a “technological profile” of the respondents. Given the myriad ways in which digital games, game elements, and gamification are defined, asking respondents about their digital game playing behaviors is challenging. In keeping with Groh’s (2012) analysis that definitions of gamification and games depend in part on individual interpretation, the informants were enjoined to employ their own understanding of games. In open-ended questions, respondents identified both the hardware and applications they use while frequency scales (5 = “frequently;” 1 = “never”) were utilized to elicit information regarding specific behaviors.

As indicated previously, subsequent items sought to establish the informants’ attitudes towards DGBLL by adapting items from the TAM (Davis, 1989; Teo et al., 2007). In all cases where generic items referred

to “information technology” or “computer usage,” questions were reframed to focus on digital gaming. Ten items focused on perceived ease of use, perceived usefulness (Davis, 1989), and learning opportunities (Bourgonjon, Valcke, Soetaert, & Schellens, 2010). Because items from the EGAM (Ibrahim et al., 2011) are not available, existing items from the TAM were adapted to address issues related specifically to utilizing digital games for English language learning. Likewise, more nuanced items were constructed to assess PSTs’ beliefs that reflect issues in DGBLL that address language learning methodology and purposes (i.e. “allow for authentic language usage” and “focus on vocabulary and grammar”). The instrument is summarized in Table 1.

Results

Pre-university experience with digital media

As regards their experience as students with digital media in their pre-tertiary schooling, the PSTs indicate that they had limited experience with most digital applications. As indicated in Table 2, while up to a quarter of PSTs indicate that they had used computers in their own schooling (grades 1 through 13) for various receptive purposes (i.e. listening and viewing English-language resources using the computer), only two activities that reached this 25% threshold (“used educational software” and “corresponded with e-penpals”) are associated, at least potentially, with productive skills or interactivity. In this context, it is unsurprising that 63% of the informants here responded that they had “never” played English computer games in the classroom, and that an additional 18% did so “rarely.”

In addition to differences in media usage that likely stem from the various schools that students attended prior to university, a significant difference in utilization could be traced to how recently the respondents had finished their secondary schooling, as indicated in Figure 1. Using semester of study as a measure, the data reveal a significant difference in media usage in EFL classes in relation to respondents’ semester of study. Given the traditional composition of this cohort, with few mature students ($n = 3$), semester of study is an adequate measure of recency of schooling in this sample. The data show that students in their first semester described substantially more digital media usage in their own schooling prior to attending university than all other semesters. Determining whether this outcome is a result of a rapidly-changing landscape, the result of fresher recall among younger students, or a statistical anomaly requires further exploration.

Table 2. Media usage in school (grades 1–13).

Descriptor ... How often did you do the following in your English class (grades 1 through 13)?	Mean	SD
We used educational software on CD Rom or on the Internet to learn English (e.g. Phase 6, English Coach).	1.68	.624
We listened to English-language podcasts or streamed spoken-word material (e.g. lectures or interviews).	1.93	.563
We listened to English-language music or watched music videos (e.g. using YouTube or Spotify).	1.79	.466
We conducted Internet-based research or completed research projects using web-based resources.	1.68	.610
We completed Webquests.	1.18	.389
We had email/chat/social media “e-pals” in English class (native speakers or other English learners).	1.26	.443
We watched English language videos or movies with an Internet service (e.g. YouTube or Hulu).	1.76	.569
We made our own English language videos for the Internet as a class assignment.	1.14	.349
We researched English grammar and vocabulary using online reference sites in class.	1.51	.601
We played English-language games using CD-ROMs or the Internet in class.	1.32	.507
We wrote English-language texts using text-based programs (e.g. Word).	1.68	.650

$n = 150$. The table shows the frequency of usage of specific digital media in German PSTs' classroom experience, grades 1–13 (mean and standard deviation) (never =1; rarely =2; regularly =3; frequently =4).

Digital application usage

A principal components factor analysis of seven items, using Varimax rotation in order to conduct exploratory analysis on uncorrelated factors, was applied, with three factors explaining 66.5% of the variance in usage types. All items in this analysis had primary loadings over .5, with six out of seven with a loading over .7. While two items had a cross-loading above .3, these items had strong primary loading. The usage of digital applications for English loads on three distinct components with adequate discriminatory power, as reflected in Table 3, reflecting three types of usage. Proactive utilization of applications for systematic language learning (I) can thus be distinguished from reactive uses for need-driven queries (II) and from playful usages (III) in the form of games.

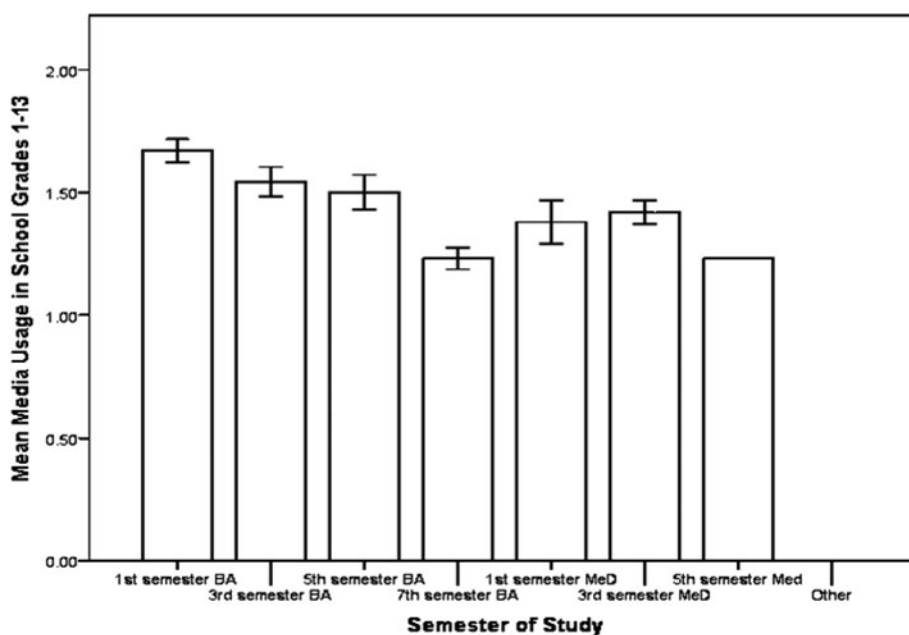


Figure 1. Mean media usage in school grades 1–13 by semester of study. Students’ use of digital media in their own primary and secondary education according to their current semester of study.

In this query, “digital games” are identified explicitly as distinct from other applications, although the argument can certainly be made that some of the aforementioned illustrations are gamified in one or more ways.

The majority of respondents do not indicate that they incorporate digital tools to systematically improve their English language skills on either the computer or the cell phone. However, the more frequently respondents in this study utilize any digital applications in English, the more likely they are to assess their use of language learning strategies highly ($r = .183$, $p < .05$). This is in contrast to respondents’ assessment of their English skills, as there was a nonsignificant correlation of $-.008$ ($p = \text{n.s.}$) between English skills and digital application usage.

Digital game playing frequency

A scale of four items to establish gaming behaviors was constructed, with an acceptable Cronbach’s α of $.737$ (George & Mallery, 2003, p. 231). Results indicate digital gaming habits are not widespread among this population, with 70% indicating that they “never,” “rarely,” or “occasionally” play digital games.

Table 3. Digital English applications.

	Proactive usages (I)	Reactive usages (II)	Playful usages (III)
I use the computer to look up English grammar, vocabulary, or spelling.	.736	.046	.218
I use the computer to play English-language games on CD-ROM or with a browser (e.g. Minecraft, The Sims).	-.036	.312	.753
I use educational programs on the computer to improve my English (e.g. Phase 6, Duolingo).	-.060	.849	.288
I use my cell phone to look things up on grammar sites or dictionaries.	.834	-.001	.041
I use an educational app on my cell phone to improve my English (e.g. Duolingo, Mindsnacks, Rosetta Stone).	.230	.849	-.050
I use an automatic translator app on my cell phone.	.556	.193	-.308
I play games in English on my cell phone.	.108	-.027	.817

Factor loadings based on a principal components analysis with Varimax rotation for seven items pertaining to frequency of selected digital usages in English.

In light of the infrequency of gameplaying reported by the informants, an assessment was undertaken to evaluate whether the disproportionate number of females in the cohort impacts the results, as some studies have suggested (Borgonovi, 2016; Miller, 2013). A *t*-test was carried out to compare gender and digital gameplaying. After all assumptions were resolved, an unpaired *t*-test at the .05 confidence level revealed no significant difference in the gameplaying behaviors between males and females ($t_{(109)} = 1.50, p > .05$).

While the majority of the respondents rate their perceived English language skills and language learning strategies highly, those who play digital games, regardless of language, tend to rate their skills slightly higher than those who do not play. While there is no significant correlation between digital gameplaying frequency and perceived English language skills, there is a significant correlation between gameplaying frequency and perceived usage of language learning strategies ($r = .246; p < .01$).

Beliefs

A scale of 10 items was constructed to examine respondents' beliefs regarding the use of DGBLL. Due to poor discriminatory power (.015),

Table 4. Factor analysis DGBLL beliefs.

	Perceived usefulness (I)	Perceived ease of use (II)	Learning opportunity (III)
Computer games can teach students authentic English language usage.	.519	-.129	.565
Using computer games in class would be motivating to my students.	.679	.331	.084
Learning to play and playing computer games in English class is too time-consuming. ^a	.322	.681	-.073
There are no good computer games for teaching English. ^a	.214	-.016	.797
Using computer games would make students think that learning should be fun.	.674	-.057	.178
The financial cost of incorporating computer games and apps in English class will cause problems. ^a	-.006	.790	-.008
Incorporating computer games and apps with improve my English instruction.	.747	.149	.090
It is too complicated to make sure the technology will work right to use computer games in the English classroom. ^a	.044	.592	.429
Computer games in English class are only good for drilling vocabulary or grammar rules. ^a	.009	.516	.638

Factor loadings based on a principal components analysis with Varimax rotation for nine items regarding DGBLL-related beliefs.

^aIndicates items were reverse-coded.

one item was removed. The resulting 9-item scale had a Cronbach's $\alpha = .724$. A principal components factor analysis of the nine items using Varimax rotation was conducted here as well, with three factors explaining 59.3% of the variance in respondents' beliefs regarding DGBLL. Eight of the nine items in this analysis had primary loadings over .6, as indicated in Table 4. Two items had a high cross-loading (.519 and .429), raising some questions about their discriminatory value. However, the beliefs regarding DGBLL load on three distinct components, as reflected in Table 4, reflecting three types of beliefs. Beliefs regarding the perceived usefulness (I), issues of ease of use (II) and relating to the value for English language learning (III) can be distinguished from one another.

Table 5. Correlations between PSTs' Beliefs and Other Scales.

Variables	1	2	3	4	5	6
1. Media usage in School (grades 1–13)	-					
2. English skills (self-assessment)	.017	-				
3. English language learning strategies	.047	.414**	-			
4. Digital English applications	.235*	-.008	.183*	-		
5. Gaming behaviors	.165	.116	.246**	.594**	-	
6. DGBLL Beliefs	-.185*	.191*	.254**	.098	.335**	-
Variables	1	2	3	4	5	6
M	1.53	4.0	3.9	2.57	1.8	3.5
SD	.29	.44	.42	.56	.93	.46
Range	1–2.23	3–5	2.6–4.9	1.43–4.29	1–4.5	2.3–4.7
α	.79	.92	.69	.51	.73	.72

PSTs' Beliefs Regarding DGBLL and Gaming, Media Usage, English Skills & Language Learning Strategies, and Gaming Behaviors: Correlations and Descriptive Statistics (n = 150).

*p < .05.

**p < .01.

These results parallel those found in other studies examining teacher adoption of DGBL without a focus on DGBLL (De Grove, Bourgonjon, & van Looy, 2012).

Correlational analyses

As indicated in Table 5, experience with digital game playing and positive beliefs towards DGBLL are significantly correlated. There are also positive correlations between PSTs' assessment of their own English skills, language learning strategies, and beliefs regarding DGBLL. There is a significant negative correlation between beliefs and media usage in school (grades 1–13).

The correlation between prior experience and behavioral intention has been previously explored in relation to DGBL (c.f. De Grove et al., 2012). The fact that actual gaming behaviors correlates with perceived language learning strategies, but not perceived English language skills, while beliefs positively correlate with both, suggests mediatory factors that necessitate further exploration. The negative relationship between prior school-based experience and current beliefs towards DGBLL is suggestive of a causative path.

Discussion

At first glance, the lack of gameplaying behavior among the respondents runs contrary to accepted wisdom about the prevalence of digital gaming and gamification across demographic subgroups. Compared with a variety of studies regarding digital gameplay in a variety of contexts (Corrin, Bennett, & Lockyar, 2010; Feierabend et al., 2016; Takeuchi & Vaala, 2014), the data found in this cohort indicate a gameplaying rate

below that of any other population. While a *t*-test did not find support for an argument based on the disproportionate gender distribution, both national and subgroup cultural norms might illuminate these reported outcomes, as discussed below.

The relative lack of digital experiences in respondents' own pre-university educational careers reflects the situation in Germany as a whole, with digital integration in school settings comparatively meagre. The ICILS study (Bos et al., 2014, p. 203) concludes that that "in no other country of the [21 nations included in the] study were computers less frequently used in instruction than in Germany." Digital literacy skills and leisure game playing are likewise below average (Frailon, Ainley, Schulz, Friedman, & Gebhardt, 2014).² As a result, it is not surprising that use of DGBLL remains negligible; the influence of thirteen years of formal education in Germany is likely a significant factor in shaping PSTs' behaviors. In contrast to their behaviors, it is actually surprising how many of the PSTs hold positive beliefs regarding DGBLL. Equally surprising is the fact that what little prior educational experience exists apparently affects attitudes negatively.

A closer look at comparable data, moreover, suggests that the PSTs' lack of game playing behavior is aberrant only when compared to the general population. Both national data in Germany and international data have detected a difference among PSTs and their peers, with PSTs engaging in substantially less digital behavior of all kinds than others in their age group. This trend was noticed internationally by Kenny and McDaniel (2011) and Hayes and Ohrnberger (2013), and has been validated in Germany in studies by Kommer and Biermann (2012) and by Schmid, Goertz, Radomski, Thom, and Behrens (2017), who conclude that PSTs use digital media least of all university students, and show the least motivation to acquire digital expertise. These findings shed further light on the contested notion of the "digital native." Along with other data that indicate limited overall usage and minimal adaptive or innovative pedagogic usage (Corrin, Bennett, & Lockyer, 2010; Margaryan, Littlejohn, & Vojt, 2011; Thompson, 2013), ambiguous attitudes towards digital media reinforce the fact that overarching generationally-based ascriptions may obscure relevant nuances and critical analyses (c.f. Bennett & Maton, 2010).

Another facet that might illuminate these usage patterns is the nature of the applications themselves. In this survey, all forms of DGBLL were considered without distinguishing among, e.g. serious games, commercial off-the-shelf games (COTs) and gamified language learning programs. This may be especially relevant as regards the population in question, which has comparatively advanced EFL skills.

Although a number of specific applications named in the survey as illustrative examples advertise their appropriateness for comparatively advanced language learners, a survey of popular language learning products found that most of these products cater to learners at the A1–B2 level (Blume, Schmidt & Schmidt, 2018), below this target group's identified proficiency levels. On the other hand, advanced language proficiency might make COTs more attractive, at least in theory. These, however, are not utilized as dedicated language learning applications. Moreover, the fact that these are also played infrequently requires explanations that go beyond those of proficiency.

Nonetheless, some students in this study do engage in gaming, with a measurable relationship to their perception of their English language learning strategies. The nature of this interaction remains unclear and bears further examination in future studies. There appears to be an indirect relationship whereby gameplaying interacts with language strategy self-efficacy, which in turn interacts with perceived language competence. However, the data here relies on self-reporting and perception; it does not necessarily reflect actual language (learning) ability.

The negative correlation between digital media usage in one's own schooling and beliefs regarding DGBLL raises new questions and refines existing findings about the role of prior experience. It is possible that students who were exposed to EFL digital media usage during their own schooling had negative experiences attributable to a range of potential factors. It might be that these prior usages, due to a general lack of interactivity, do not reveal the potential of digital media for productive language learning. Students may have also encountered educators who, as pioneers in this area, struggled to integrate these tools effectively, either as a result of inadequate technological pedagogical content knowledge (TPACK) or due to limited sophistication of the available digital tools. Ultimately, it might be that some kinds of media usage do not translate into receptivity towards other kinds of media usage (Šumak, Heričko, & Pušnik, 2011).

Conclusions

Although the foregoing results may appear surprising, in that they call into question existing assumptions about the prevalence of digital gameplaying, the real surprise lies in the relative receptivity of PSTs towards DGBLL despite a general lack of personal experience. These findings complicate the results of recent studies that suggest that German PSTs lack the inclination to utilize digital tools for teaching and learning purposes. It appears that, not only is there a discrepancy between personal

and pedagogical media usage, including gaming, but that existing models positing the importance of prior experience in shaping attitudes are insufficient. In this analysis, the lack of prior experience is juxtaposed with a general receptivity towards utilizing DGBLL. Moreover, the prior educational experiences that do exist have a negative impact on beliefs regarding DGBLL, intimating that no media usage might be better than poor media integration.

The study has several limitations. Survey responses can be affected by common rater effects, and item context and characteristics effects (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Despite the fact that other studies reinforce the findings regarding digital media usage among this population (Fraillon et al., 2014; Schmid et al., 2017), the relatively small sample size drawn from one university raises questions as to whether the population is representative in its beliefs towards DGBLL. Thus, the findings described here requires both larger replication studies as well as other research methods that enable data triangulation. Moreover, the results generated from a university population with relatively advanced EFL skills do not necessarily apply to other populations with less advanced EFL skills or who are learning an L2 other than English. Given its preeminence in digital worlds, the relationship of DGBLL in English to language skills and strategies, as well as beliefs, may differ substantially from that of the relationships of these constructs to other languages.

The respondents indicate generally positive beliefs regarding DGBLL. This has significant implications in terms of teacher preparation, which needs to provide adequate initial training, especially in light of limited role models in practice (Hammond et al., 2009). Given the relationship between digital gaming and English language learning strategies, doing so could potentially improve future teachers' ability to strengthen strategic language learning.

Notes

1. For more information about the German school system, see Kultusministerkonferenz (2017).
2. In recognition of these issues, the German government in 2016 announced a substantial "digital education initiative," with the goals of promoting digital competencies and researching digital educational processes (Bundesministerium für Bildung und Forschung, 2016).

Disclosure statement

No potential conflict of interest was reported by the author.

Notes on Contributor

Carolyn Blume is a doctoral candidate at the Leuphana University in Lüneburg, Germany. Her interests are in the areas of computer-assisted language learning, digital game-based language learning, special educational needs in EFL, teacher education for inclusive education, and issues of social justice in EFL.

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7.3 Blume, C. (2019). Playing by their rules: Why issues of capital (should) influence digital game-based language learning in schools. *CALICO Journal*, 36(1), 19-38.

Playing By Their Rules: Why Issues of Capital (Should) Influence Digital Game-Based Language Learning in Schools

Carolyn Blume

Abstract

While digital gaming is increasingly recognized for its potential for language learning, its use among English as a foreign language (EFL) teachers in both leisure and pedagogical contexts is comparatively meagre. Assumptions regarding the appropriate nature of schooling on the one hand and appropriate leisure pursuits on the other mediate beliefs about digital gaming to generate skepticism of gaming among many educators. Their devaluation of digital game-based language learning (DGBLL) has implications for language learning, not just in terms of skills and attitudes, but in regard to the development of linguistic capital. The purpose of this article is to use the concept of habitus to examine the reasons why educators marginalize DGBLL and the implications of such pedagogic decisions on the development of linguistic capital. Given the emergent empirical base, this contribution adopts a theoretical approach to contextualize observed trends. The article concludes by discussing the importance of teacher-mediated DGBLL for reasons of access and equity before recommending ways of integrating DGBLL to achieve these goals.

KEYWORDS: DIGITAL GAME-BASED LANGUAGE LEARNING; LINGUISTIC CAPITAL; DIGITAL INEQUALITY; DIGITAL DIVIDE; HABITUS

Introduction

Despite the supposed universality of digital gaming (ESA, 2015), emerging evidence suggests that, as a group, pre-service and in-service teachers engage in

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less gameplay than their peers. As Kenny and McDaniel (2011) point out, this trend challenges the assumption that “just because up-and-coming teachers have been brought up in the digital age, they are automatically familiar with, disposed to using, and have positive ideas about ... games” (p. 200). Instead, the accumulating evidence suggests just the opposite—namely, that future and beginning teachers are disinclined to utilize digital games. A new type of “digital divide” is emerging, predicated not on material access as it is meant in the original sense, but on attitudes (cf. Selwyn, 2004). Where the lines of this divide stretch is not entirely clear, but digital gaming—a category that includes an array of objects and activities¹—seems to fall on one side of this fault.

The role of English both on- and offline makes this state of affairs particularly relevant for teaching EFL. There is substantial research documenting the salutary effects of digital game-based language learning (DGBLL) in terms of language skills, motivation, and opportunities for meaningful interaction (Peterson, 2013). Moreover, utilizing DGBLL could enable access not just to a body of knowledge and favorable attitudes; it could facilitate the development of cultural capital more generally, and linguistic capital, i.e., knowledge of language that mediates access to symbolic power (Bourdieu, 2011), more specifically. However, without guidance by educators as informed practitioners, a lack of gameplaying literacy creates a new kind of digital divide that has the potential to deepen socioeconomic disparities by limiting the acquisition of legitimized linguistic capital and devaluing learners’ extramurally acquired linguistic capital.

Drawing on themes already under consideration in foreign language pedagogy, research on game-based learning, and studies of access and equity, this contribution proposes that DGBLL is an essential element of K-12 EFL instruction in high income countries (cf. Fantom & Serajuddin, 2016) because of its potential to mediate differentials in students’ linguistic capital. The article discusses the emerging evidence surrounding teachers’ gameplaying behavior before examining factors that account for these patterns. It relies in part on Bourdieu’s conceptions of *habitus*, i.e. individuals’ socially and culturally acquired and ingrained behaviors and sensibilities (Grenfell, 2014) to explain this behavior. The argument will subsequently be made that these non-playing tendencies disenfranchise these teachers’ students by perpetuating their exclusion from certain *habitus*. Building on the concept of “gaming capital” (Walsh & Apperley, 2008), the focus is on research that establishes DGBLL’s multiple benefits in developing linguistic capital in terms of motivation, language acquisition via sociocultural processes, and identity construction. Thus, the notion of capital is a pivot for both understanding why these patterns exist and why they are problematic. The paper concludes by considering implications for instruction.

Given the dearth of empirical data, the arguments rely primarily on theoretical and conceptual work. This contribution is part of a larger project that analyzes pre-service teachers' gaming behavior, informing the theoretical assertions made here. The limited data set is employed, alongside related studies, to indicate this is an area necessitating further study. The emphasis is on seeking explanatory models for this apparent state of affairs, as well as highlighting why it is of concern.

Teachers' Digital Gaming and DGBLL

Digital Gaming Practices among Teachers

Literature attesting to "the socio-cultural trend of ludification" (Groh, 2012, p. 41) has masked significant subgroup distinctions. While culture, gender, and age-related differences have been thoroughly examined in this regard (Iversen, 2015; Park & Wen, 2016; Williams, Consalvo, Caplan, & Yee, 2009), only limited research has focused on other distinctions, including those of race and class (Jackson et al., 2008; Koivusilta, Lintonen, & Rimpelä, 2007). Whereas qualitative studies have identified significant differences in gaming behaviors among these groups, the findings of initial quantitative analyses tend to be contradictory.

The degree to which teachers present a unique subgroup also remains unclear, although the data suggest their behavior is atypical. Shaffer, Squire, Halverson, and Gee (2005) intimate low usage of digital games among teachers without providing specific data. Kenny and McDaniel's (2011) analysis indicates that 42% of the pre-service teachers they surveyed in a small sample regularly engage in digital gameplay, compared with 80% of that age group among the general population. Of the 76.4% of the pre-service teachers who indicated that they played video games in a survey by Schrader, Zheng, and Young (2005), almost half played for less than an hour per week, suggesting a comparatively low rate of play. More recently, similar results have been reported by Wu (2015) and Hayes and Ohrnberger (2013). However, Takeuchi and Vaala (2014) found widespread extracurricular play among the teachers they surveyed. Such discrepant results suggest the need for further studies, including ones that take into account potential subgroup differences, such as those related to the target teaching population (e.g., early childhood, secondary school, or adult education professionals) or subject area.

Descriptive and quantitative data from outside the United States, but from other high income countries, suggest low rates of play among teachers and future teachers, although these data remain inconclusive given the various ways in which "regular play" and "games" are defined (Alqurashi & Williams, 2017; Chik, 2011; Martín del Pozo, Basilotta Gómez-Pablos, & García-Valcárcel Muñoz-Repiso, 2017; Sundqvist & Sylvén, 2012). In one recent

sample in Germany, only 30% of pre-service teachers indicated regular digital gameplay (Blume, 2019). This compares to a digital gameplaying rate of approximately 42% among the population as a whole (ISFE, 2012) and a rate of 68% among German youth (Feierabend, Plankenhorn, & Rathgeb, 2016). Data about media attitudes in general (and not specifically regarding gaming) come to the same conclusion: pre-service teachers in Germany are disinclined to utilize digital media (Schmid, Goertz, Radomski, Thom, & Behrens, 2017).

Explaining Teachers' Digital Gaming Behavior

Researchers have adopted and adapted a number of paradigms to explain the reluctance of educators to utilize game-based learning in general (cf. Sánchez-Mena & Martí-Parreño, 2017, for a partial review), and, in initial studies, DGBLL specifically (Chen, Chen, Chen, & Yang, 2012; Chik, 2011). The Technology Acceptance Model (Bourgonjon et al., 2013), Educational Game Acceptance Model (Ibrahim, Khalil, & Jaafar, 2011), TPACK-G (Hsu, 2013), and pedagogical beliefs (Ertmer, 2005) are some of the theoretical constructs utilized to explain teachers' attitudes towards game usage. A recurring focus is accorded to the role of personal gameplaying experience, with most studies concluding that it is a determining factor regarding teachers' adoption intention. Thus, what happens in teachers' milieus prior to, and outside of, the classroom is critical for understanding their gameplaying behaviors in the classroom.

Although gender and age continue to be examined as explanatory categories for differential play, the evidence is contradictory (Williams et al., 2009). With socioeconomic status (SES), education levels, and race accounting for some of these discrepancies in the general population, what is emerging as an area of focus is differential acceptance informed by sociocultural attitudes. For teachers raised within *habitus* that question both "playful learning" and digital leisure activities, the result is a denigration of the value of digital gaming in any context.

Attitudes About Schooling

Attitudes regarding the proper nature of education inform acceptance of game-based learning. The notion that school should be "fun" is not universally accepted (Prensky, 2007). More frequently, education is seen as "hard work" and games are therefore inappropriate (Chik, 2014; Stewart et al., 2013). In the case of EFL, the fear of playful approaches might be stronger than in other domains; Thomas (2012) theorizes that opposition specifically to DGBLL may come from EFL academics, who fear that language learning already suffers from an unserious image.

There is moreover a general skepticism towards incorporating students' "lifeworlds" (Beavis et al., 2015) into instruction. Not only are teachers frequently

less skilled gamers than their students (Sundqvist & Sylvén, 2012); digital games forefront students' interests (Grau & Legutke, 2015), thus implicitly challenging educators' assessment of what is worth knowing and, concomitantly, relationships of power and authority (Hill, 2008). This reluctance to include "popular" culture exists not just on the part of educators, but also among some students who question teachers' intentions (Jones, 2017; Sauro, 2017). In EFL, this tension is exacerbated by contested notions of what constitutes "proper" English (Tollefson, 2007).

Attitudes Towards Gaming

While Thomas (2012) asserts that gaming has contributed to "overturning ... the assumptions that popular culture and its artefacts are always antithetical to serious learning" (p. 19), others are not as sanguine. Eklund (2015) points out that "an enduring moral panic still clings to the medium ..." (p. 276). Even when digital gaming is not seen as somehow dangerous, its inherent value is questioned (Friedrichs, von Gross, Herde, & Sander, 2016). Reinhardt and Zander's (2011) experiences revealed tensions over tertiary students' assessments of DGBLL's relevance, which the authors attribute to the students' *habitus* and, specifically, to a "utilitarian home discourse" (p. 338). This devaluing of gaming mirrors the institutional denigration of other popular culture forms that often simultaneously comprise students' lifeworlds and their capital (cf. Hill, 2008).

Kommer and Biermann (2012) rely on a notion of an unwelcoming *medial Habitus* arising from a traditional middle-class skepticism of mass media to explain the rejection of digital games among pre-service teachers in Germany. This critical view of media, held by the middle class from which teacher candidates in Germany are heavily drawn (Kühne, 2006), persists despite the penetration of digital tools for professional and communicative purposes. These pre-service teachers possess material access, but the motivational desire for access among these "want nots" (van Dijk, 2012) is absent.

While the explanations for these attitudes are manifold, there is increasing evidence that various SES groups engage in differential patterns of digital media usage (Hollingworth, Mansaray, Allen, & Rose, 2011). Data regarding gaming specifically is meagre, but Goldfarb and Prince (2008) conclude that, among those who go online, individuals with lower SES are more likely to play games. Likewise, Graham (2017) and Koivusilta et al. (2007) establish a correlation between parental levels of education and adolescents' leisure gaming in the United States and Finland respectively. Although some data suggest attitudes towards gaming are evolving, (not) playing games remains an expression of *habitus*.

Teachers as (Problematic) Gatekeepers

The dilemma is that teachers, who potentially have access to linguistic capital thanks to their *habitus*, choose to withhold access due to attitudes stemming from that *habitus*. This reinforces what Kvasny (2006) refers to as “digital inequality,” i.e., a differential ability to benefit from digital access. By not valuing gaming, educators reject the notion that game discourse is legitimate linguistic capital, thereby undermining the validity of games and the skills of those who play them. Mediated access to digital games could provide access to discursive knowledge that could enable players to both take advantage of the opportunities it offers and challenge its unwitting, inequitable reproduction.

DGBLL and Linguistic Capital Creation

English as Linguistic Capital

Bourdieu and Wacquant (1992) describe linguistic capital as an ability, shaped by one’s *habitus*, to employ utterances that wield symbolic power; it is an embodied form of cultural capital (Bourdieu, 2011). In the formal language learning setting, learners from less privileged *habitus* are at a disadvantage academically, although the explanations as to why this is differ (cf. Gayton, 2010). While Gee (2004, p. 83) maintains that linguistic capital is acquired primarily in school and in select homes, creating for its adopters a type of school-oriented consciousness akin to a *habitus*, Pishghadam and Khajavy (2013) use sequential equation modeling to emphasize how cultural capital in turn shapes psychological factors that influence language learning. Regardless of the mechanisms, the relationship between various forms of capital and academic success is well-documented, albeit inadequately considered in the EFL classroom (cf. Vandrick, 2014).

The ability to communicate in English is a form of linguistic capital both on- and offline. While Phillipson (2008) questions the degree to which English is a universal language, he suggests that the actual quantification of its usage is secondary to how it is perceived as such. Despite recent attempts to validate varieties of English (cf. Tollefson, 2007), certain kinds of English, with particular pronunciation, dialect, and narrative structures, continue to serve as symbols of power and status (Block, 2012). Access and aspiration reinforce one another; those who have the ability to pursue English instruction (both in terms of quantity or perceived quality) do so by a variety of means (Waters, 2005).

Access to online content is mediated by linguistic knowledge. Whereas at the turn of the century it was estimated that 80% of web pages were in English, more recent data suggest that this figure has fallen to 45% (Pimienta, Prado, & Blanco, 2009). Yet English still represents the single most popular language on the Internet. In the United States, monolingual websites for public services

illustrate how digital illiteracy emerges from intersectional inequities of migration, poverty, and language (Warschauer, 2003). Gameplaying itself is equally shaped by the domination of English-language applications and, given the linguistic sophistication of many applications (Thorne, Fischer, & Lu, 2012), only players with an adequate degree of English knowledge are able to meaningfully participate.

DGBLL's Motivational Contributions to Linguistic Capital

The ability of DGBLL to develop positive attitudes towards language learning has been examined from a variety of perspectives, with the consensus emerging that flow creates intrinsic motivation and encourages further interaction with the medium itself. Flow, as conceptualized by Csikszentmihalyi (1990), emerges when individuals experience a perceived balance between their abilities and the presented challenge. In addition to receiving positive reinforcement, gameplayers (in this case) enjoy a sense of control and a lack of self-consciousness, facilitating intense concentration and goal-orientation (Sykes & Reinhardt, 2013). Research has focused on various elements of DGBLL that ostensibly contribute to flow, including immersion, narrative, interactivity, social interaction, autonomy, and achievement (Dickey, 2007; Yee, 2006). Although the findings regarding the role of these elements for language acquisition are inconclusive (deHaan, Reed, & Kuwada, 2010), evidence for their effect on attitudes is substantial (Peterson, 2010).

Other explanations of how digital gaming enhances language learning motivation focus on its authenticity, although the notion of authenticity in digital environments is contentious (cf. Buendgens-Kosten, 2013). While it is debatable whether educational games are authentic language usage situations, given their lack of socially constructed validity and distance from real-world encounters, authentic gaming offers meaningful opportunities to use the target language in situated contexts (Gee, 2004). Even more important than being authentic artifacts, digital games allow students to be their authentic selves, i.e., the games reflect their core values and interests (Henry, 2013, p. 139). This congruence generates engagement (cf. Thorne & Reinhardt, 2008).

Motivation is further enhanced through the playful feedback inherent in digital games. In contrast to other online activities, where errors can lead to embarrassment and thus discourage use among less-resourced users (Kvasny, 2006), the incorporation of “fail states” into well-constructed digital games generates a safe space wherein mistakes (whether they result from miscommunication or not) form part of an enjoyable learning curve (Cornillie, Clarebout, & Desmet, 2012; Prensky, 2007). Neither traditional classrooms nor other “offline” interactions, where learning and communication are fraught with communicative pressures, can afford the safety of games regarding errors.

The “low stakes” structure of games, along with an acceptance of imperfect or colloquial language in interactions in and around games, leads to salutary effects on students’ anxiety and willingness to communicate (Reinders & Watanana, 2015).

DGBLL’s Sociocultural Contributions to Linguistic Capital

The research that DGBLL provides numerous affordances for processes of sociocultural language acquisition is convincing. These affordances emerge through the relationship between the medium and its multiple users (cf. Blin, 2016). Not only is the language utilized in many games sophisticated and authentic, it also frequently takes place within a network of social exchanges that persist beyond the gameplay itself (Black & Steinkuehler, 2009). These exchanges facilitate attempts to acquire game-based skills and introduce players to new *habitus* and, in doing so, provide players with the skills to query not just the game, but also the world around them.

While several studies have identified ways in which language learning occurs through self-directed digital gameplaying (Rama, Black, Van Es, & Warschauer, 2012; Sylvén & Sundqvist, 2012), Chik (2014) focuses on how gameplayers use their gameplay communities to manage their DGBLL practices. She argues that, “when digital gaming is a community-based activity, the autonomous learning involved will inevitably be community-based as well” (Chik, 2014, p. 87). In the absence of a gaming community, either due to the (limited) choice of games or lack of game literacy skills, some gameplayers will proactively construct them (Chik, 2014). Individuals without the linguistic or structural ability to access such a community miss out both on the opportunity to direct their learning and on the affordances that emerge from collaborative gameplaying. The practice of learner autonomy within a sociocultural learning model is thus closely aligned with the presence and accumulation of linguistic capital.

Narrowing in on collaborative game play in massive multiplayer online role-playing games (MMORPGs), Steinkuehler and Williams (2006) demonstrate that online gaming takes place in “social third spaces” that expose players to a diversity of perspectives. The games serve as “trajectories for participation in social systems” (Squire, 2008, p. 653) that are otherwise foreign to many players. They resemble online “communities of practice” (cf. Stewart et al., 2013) that introduce learners to specific discourses and ways of thinking (Shaffer, 2006). The ability to participate in such “semiotic domains” (Gee, 2008) is dependent not just on specific language skills, but on possession of linguistic capital endemic to these communities (cf. Jenkins, 2009).

This participative process challenges accepted notions about existing institutional and social structures. Steinkuehler (2008), referring to MMORPGs, posits that

through participation in and reflection on such worlds, we are better able to understand how it is that the sense we make of events, contexts, and other people are not fixed and inevitable “truths” out in the world but interpretations that are created, maintained, and transformed by specific groups of people at specific historical times for specific reasons. (p. 626)

Rather than being passive subjects of realities constructed around them, linguistic capital enables individuals to co-construct these realities. This may help explain teachers’ reluctance to incorporate games in the curriculum, especially in poorer schools, where authority is enacted most stringently (cf. Warschauer, 2003).

Linguistic Capital, Identity, and DGBLL

Participation in alternative realities provides players with opportunities to experiment not just with language, but also with identity (cf. Jenkins, 2009). This is evident in a game when the player constructs an avatar or joins a guild (Cheong & Gray, 2011) and beyond in fan fiction, forums, code alterations, and self-organized learning communities (Black, 2009; Squire, 2012). Squire (2008) highlights the fact that “games’ most potent social value may be their *liminality*, their capacity to function as contexts within which participants can play with new identities and ideologies” (p. 651). These “projective identities” (Gee, 2004, p. 102), in turn, allow players to perform different *habitus*.

Beyond embodiment as avatars or playing characters, players engage in identity construction through interaction. Zheng, Wagner, Young, and Brewer (2009) show how contribution to chats in an MMORPG provide substantial opportunities for both language development and identity construction. Similar findings have been documented in relation to bridging activities (Reinhardt & Zander, 2011). As Thorne, Sauro, and Smith (2015) summarize,

[f]or L2 learners, ... learning involves developing new, or enhancing existing, performative repertoires. In this sense, notions of ‘learning’ and ‘identity’ are dialectically bound to one another and are emergent of, as well as contribute to, the ongoing formation and organization of social conditions. (p. 217)

Just as language is closely linked to the formation and construction of identity, so too is participation in digital gaming communities fundamentally connected to identity development, (re-)imagination, and social change.

DGBLL as a Tool for Equity and Access

It is in regards to DGBLL that the gap between digital “haves” and “have-lessers” has the potential to develop into a chasm. The popularity of digital gaming serves to exclude those who do not or cannot participate adequately.

What is important, moreover, is not just access to digital games, but access to understanding games as a type of literacy. Without guided support, players of digital games are “mere” consumers without the opportunity to be “prosumers” (Thomas, 2012, p. 18) who can create not just alternate game paths, but alternate realities.

Not only do games give rise to various types of capital, but the games themselves also embody cultural capital (Seufert, 2017; Stewart et al., 2013) and are critical to identity development in relation to that capital (Bartlett, 2008). Their sheer popularity makes them an integral part of general mainstream culture, such that lack of knowledge of (specific) games or game activities can contribute to exclusion (BMFSFJ, 2016). As references to games proliferate in wider cultural settings, adolescents with limited qualitative or quantifiable access are faced with gaps in their linguistic capital and an increasingly circumscribed ability to infer these meanings without critical literacy skills.

It may seem that digital games are ubiquitous among adolescents, furthering the impression that access to games is not an issue of equity. However, emerging data suggest that gameplaying is most frequent among youth from working-class backgrounds, with those from both poorer and wealthier families playing less frequently (Graham, 2017). It is the poorest adolescents for whom gameplaying, and the acquisition of related capital, may be far from reach.

What is also unclear are the ways in which *differential* access to games affects the accumulation of capital. Thus, while children from less-resourced environments are playing games, it remains unclear what kinds of games they play, in what contexts, and with what kind of guidance and meaning-making opportunities (cf. Li & Ranieri, 2013; Seiter, 2008). Gameplayers who rely on public institutions for access have to contend with slower speeds, limited length of use, constraints on storage capacities, and censorship (Seufert, 2017). Opportunity cost and access to leisure time are also significant considerations; gaming of the kind that can contribute to the aforementioned possibilities may be an “investment” beyond the typical reach of many youth.

Game type may also be affected by a variety of these factors. Graham (2017) shows that those games preferred by working-class adolescents are what he labels “male genre” with limited narrative, and which may not be equally conducive to the generation of linguistic capital. Although Graham describes these games as peculiarly male, other researchers have focused, conversely, on the limited opportunities for linguistic development among females *vis-à-vis* digital gameplay. While there is continuing disagreement regarding the amount of gameplaying women engage in, there are indications that, for those females who do play, opportunities for sociocultural interaction or identification are shaped by the nature of the games they play and by how games

construct female characters (Eklund, 2011; Sylvén & Sundqvist, 2012). While these analyses are still being contested (cf. Williams et al., 2009), they suggest additional types of disenfranchisement that may occur when gameplaying is relegated to extramural usages.

These findings reiterate the fact that physical access to games is inadequate without game literacy skills. Jenkins (2009, p. 15) describes how participation, analysis, and ethical evaluation represent three different levels of access that are left to chance when educators marginalize digital media. While participation relates to physical access, the ability to analyze games and act accordingly relies on digital literacy skills (Walsh & Apperley, 2008). Warschauer (2003, p. 27) predicts that such differential access will distinguish between those who act and those who are acted upon in the future.

The potential of DGBLL to enhance learner autonomy, a key factor in the ability to shape one's environment, is likewise dependent on the existence of certain attitudes, skills, and capital. As Reinders and Hubbard (2013) paradoxically point out, "technology often requires precisely those self-directed learning skills it is intended to help develop" (p. 359). Assuming all learners are capable of autonomous knowledge acquisition is detrimental especially to those learners who have not had the opportunity to develop autonomous learning skills. Studies of autonomy conducted in relation to varying *habitus* demonstrate the variation of learner autonomy in various sociocultural milieus (Bremer, 2009; Hollingworth et al., 2011).

Similarly, there are indications that there is a potentially powerful relationship among SES, learner autonomy, and DGBLL. First, children from lower SES settings are more likely to engage in directive, authority-driven learning and computer use (Warschauer, 2003). Thus, they have fewer opportunities to engage in the kinds of computer-based activity that foster autonomy. Secondly, their limited extracurricular use of sophisticated digital applications further thwarts their access to opportunities for generating learner autonomy.

Discussion and Conclusions

It is important to recognize that using digital games in the classroom does not automatically promote equity. School-based usage differs by SES, with educators in less-resourced schools less likely to enact digital practices that support critical digital literacy (Reinhart, Thomas, & Toriskie, 2011; Wood & Howley, 2012). Moreover, the continued privileging of English in games, foreign language pedagogy, and research of these issues, needs to be more substantially problematized (cf. Sauro, 2016).

Even when integrated into a critical media literacy approach, digital games remain products conveying implicit and explicit ideologies. Digital game

environments can as easily reinforce disempowerment as they can empower (Stewart et al., 2013). Gaming in the classroom will only mediate inequity if the pedagogy around them is designed to do so (Apperley & Beavis, 2014). One illustration of how this can be done is described by Squire and Barab (2004). In their study of an urban, African-American class' use of *Civilization*, students wrestled with issues of identity, authenticity, agency, and equity. Although this example does not explicitly address the issue of language learning, the authors' descriptions yield promising instances of how this could be addressed.

Their approach is illustrative as well, because critical approaches to game literacy may backfire if games are merely problematized as potentially dangerous or meaningless pursuits. Such an approach diminishes not just the games, but also the cultural capital they represent to players and the linguistic capital they generate (cf. Jones, 2018). It furthermore significantly diminishes their cultural and functional authenticity (cf. Buendgens-Kosten, 2013), weakening their potential impact as socially validated activities. While all didactization erases some authenticity, "bridging activities," as described by Thorne and Reinhardt (2008), minimize this loss by celebrating students' leisure activities, knowledge, and capital.

Educators need to consider DGBLL in relation to their non-game pedagogical content knowledge (Shulman, 1986) and how their decision-making processes in this regard reflect milieu-specific assumptions. This can be done only with an understanding of *habitus* and capital, their own and their students', to comprehend "differences in gender, class, cultural background, all of which can have a profound impact upon how/when/why students would be engaged or motivated in working with specific games" (Beavis et al., 2014, p. 577). Given the potential of DGBLL to mitigate some of these aforementioned disparities by both developing capital and valuing students' pre-existing capital, renewed attention needs to be focused on these issues.

Notes

1. See Sykes and Reinhardt (2013) for one categorization of games, and Reinhardt and Sykes (2012) for gaming activities.

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8 Appendices

8.1 Appendix A: Prüfliste zur Analyse digitaler Fremdsprachenlernspiele [Evaluation tool to analyze digital foreign language learning games]

Prüfliste zur Analyse digitaler Fremdsprachenlernspiele

1 Allgemeine Produktbeschreibung I

- Wie heißt die Anwendung? _____
- Wann ist die Anwendung erschienen? _____
- URL der Anwendung _____
- Auf welchem System läuft die Anwendung? iOS Android Windows Web

2 Webunterstützung

Falls die Anwendung als App und als Webversion existiert, welchen Umfang hat sie im Vergleich?

- Anwendung ist lediglich als Webversion umgesetzt
- gleicher Umfang (Ausstattung in der App und Webversion)
- mehr Funktionen als in der App Version; bitte ausführen: _____
- weniger Funktionen als in der App Version; bitte ausführen: _____

3 Allgemeine Produktbeschreibung II

Welche Bezahlmodelle stehen für die Anwendung zur Verfügung?

- Free to Play
- Testversion + kostenpflichtige Vollversion
- kostenpflichtige Vollversion
- kostenloser Anfang, weitere Lektionen/Inhalte müssen erworben werden
- Lösungshilfen (Vokabellisten, Lernhilfen, Lösungshinweise etc.) können zugekauft werden
- Virtual Currency/Virtual Goods/Premium Items
- Sonstiges, bitte ausführen: _____

Wie hoch sind die Gesamtkosten der Anwendung?

- kostenlos
- kostenpflichtig, Angabe in Euro: _____

In welcher Form wird die Anwendung distribuiert?

- AppStore

-
- Playstore
 - Website zu einer spezifischen Anwendung
 - Facebook
 - Metaplatform
 - sonstiges, bitte ausführen: _____

In welchen Lebensbereichen wird die Anwendung eingesetzt?

- Familie
- Schule
- Ausbildung
- Studium
- Beruf
- sonstiges, bitte ausführen: _____

Gibt es Lehrwerkbezug?

- nein
- ja, bitte ausführen: _____

4 Zielgruppe und fremdsprachendidaktischer Einsatzbereich

Gibt es Herstellerangaben zur Zielgruppe?

- Kinder (bis 11 Jahre)
- Jugendliche (12-17 Jahre)
- junge Erwachsene (18-25 Jahre)
- Erwachsene (über 25 Jahre)
- bestimmte Zielgruppen, bitte ausführen: _____
- keine Herstellerangabe

Welche Fremdsprache soll gelernt werden?

- Englisch
- Deutsch
- Französisch

-
- Spanisch
 - Italienisch
 - Russisch
 - sonstige, bitte ausführen: _____

Wird zur Vermittlung eine andere Sprache als die Zielsprache entwickelt?

- Englisch
- Deutsch
- Französisch
- Spanisch
- Italienisch
- Russisch
- sonstige, bitte ausführen: _____
- nein

Können die Nutzer die Programmsprache bei Bedarf ändern?

- nein
- ja, bitte ausführen: _____

Wird ein Lernniveau genannt?

- CEF
- ILR
- Bezug zu sonstigen Niveaustufen, bitte ausführen: _____
- nein

5 CEF Lernniveau

Welche(s) CEF Niveau(s) ist (sind) angegeben?

- A1
- A2
- B1
- B2
- C1
- C2

6 ILR Niveau

Welche(s) ILR Niveau(s) ist (sind) angegeben?

- Level 1
- Level 2
- Level 3
- Level 4
- Level 5

7 Didaktische Analyse

Entspricht das angegebene Lernniveau dem tatsächlichen Lernniveau (nach Erfahrungsgemäßer Einschätzung)?

- ja
- nein, bitte ausführen: _____
- keine Angabe

Welche sprachlichen Kompetenzbereiche werden gefördert?

- folgende Wortschatzthemen: _____
- folgende Grammatikthemen: _____
- Leseverstehen: _____
- Hörverstehen: _____
- Schreiben: _____
- Sprechen: _____
- Aussprache: _____
- Sprachmittlung: _____
- interkulturelle Kompetenz: _____
- Sprachlernkompetenz: _____

Welche inhaltlichen Schwerpunkte und Themen sind in der Anwendung zu finden? _____

Findet in der Anwendung eine integrierte Vermittlung der Sach-Fach-Inhalte und des Fremdsprachenlernens statt (CLIL)?

- ja, durch Aufgabenstellung

ja, durch Integration in das Curriculum

ja, bitte ausführen: _____

nein

Wie findet die Sprachvermittlung statt?

überwiegend didaktisch aufbereitet (z.B. explizite Vokabel- und Grammatikübungen)

überwiegend inzidentell (z.B. entdeckendes Lernen, echtes Interagieren)

Sind die Herstellerangaben zu Zielgruppen, Inhalten und Einsatzbereichen insgesamt zutreffend?

ja

nein, bitte ausführen: _____

keine Angabe

Sofern andere Adressaten/Multiplikatoren mit einbezogen werden, bitte genaue Angaben hierzu machen.

(z.B. Möglichkeit für Lehrkräfte oder Eltern, Inhalte und Schwierigkeitsgrad für den Schüler anzupassen, Ergebnisse einzusehen oder selbst aktiv in einer Rolle mit zu spielen; offline Begleitmaterialien für Lehrkräfte für die Arbeit mit dem Spiel etc.): _____

8 Behavioristische Elemente

Haben die fremdsprachlichen Übungen innerhalb der Anwendung insgesamt einen Drill & Practice-Charakter (z.B. Multiple-Choice und Lückentextaufgaben, Fokus auf wiederholendes Üben, ohne Möglichkeiten der Anpassung etc.)?

ja, bitte ausführen: _____

nein

Werden die Übungen in der Anwendung überwiegend in einer festgelegten Reihenfolge präsentiert?

ja

nein, bitte ausführen: _____

Werden zu erlernende Inhalte ohne eigenen Einfluss des Nutzers vorgegeben (z.B. Grammatiklernen, Wortfelder etc.)?

ja

nein, bitte ausführen: _____

Werden überwiegend unmittelbare Feedbackformen eingesetzt?

-
- ja
 - nein

Werden bzw. können Inhalte (ohne weitere hinführende Hilfe, erklärendes Feedback o.ä.) so lange wiederholt/geübt werden, bis sie korrekt wiedergegeben werden?

- ja, bitte ausführen: _____
- nein

9 Kognitivistische Elemente

Bietet die Anwendung Lerninhalte, die Verbindungen zu bereits vorhandenen Wissens- und Erfahrungsstrukturen herstellen?

- ja, bitte ausführen: _____
- nein

Sind abgestufte Hilfsangebote verfügbar, die den Nutzern genau das Maß an Hilfe bieten, das sie zum Zeitpunkt des jeweiligen Lernprozesses benötigen?

- ja, bitte ausführen: _____
- nein

Besitzt die Anwendung die Fähigkeit, das Lernverhalten und den Wissensstand des Lernenden zu analysieren und sich darauf basierend optimal den Lernbedürfnissen anzupassen?

- ja, bitte ausführen: _____
- nein

Können aufgaben mittels unterschiedlicher Strategien und Wege bearbeitet werden?

- ja, bitte ausführen: _____
- nein

Werden die Nutzer zum eigenständigen Vertiefen der Lerninhalte angeregt?

- ja, bitte ausführen: _____
- nein

Gibt es aufgaben oder Programmelemente, die explizit zur Entwicklung von Sprachlernbewusstsein oder Sprachlernstrategien anregen?

- ja, bitte ausführen: _____
- nein

10 Konstruktivistische Elemente

Wird insgesamt ein selbstbestimmtes, eigenverantwortliches Lernen durch ausreichende Anpassungsfunktionen der Anwendung ermöglicht? (z.B. durch Möglichkeit der Auswahl eigener Lernziele, Auswahl von Inhalten, Lernwegen und Schwierigkeitsgrad etc.)

ja, bitte ausführen: _____

nein

Werden die Anwendungsinhalte möglichst authentisch bzw. realitätsbezogen dargestellt?

ja, bitte ausführen: _____

nein

Gibt es Elemente, die die Nutzer zur aktiven Lösung von Problemen unter Anwendung des individuellen Wissens bewegen? (z.B. bei der Lösung von Lernabenteuern)

ja, bitte ausführen: _____

nein

Ermöglicht die Anwendung insgesamt formen entdeckenden Lernens in einem „rich learning environment“ (fremdsprachlich reichhaltige Umgebung mit zahlreichen Gelegenheiten zur Nutzung und Entdeckung verschiedener Informationsangebote, Lernressourcen oder Werkzeuge)

ja, bitte ausführen: _____

nein

11 Analyse von Anwendungseigenschaften I

Wie lassen sich die Inhalte der Anwendung beschreiben? _____

12 Analyse von Anwendungseigenschaften: Narrative Struktur

Gibt es insgesamt eine Story, die der Anwendung zugrunde liegt und in der sich der Nutzer bewegt? (z.B. Ritter, der die Prinzessin befreien muss und dabei verschiedene Abenteuer bestehen muss)

ja, bitte ausführen: _____

nein

Handelt es sich um eine Casual-Anwendung?

ja

-
- nein

Welchem Spielgenre kann die Anwendung zugeordnet werden?

Action

- Jump'n'Run
- Ego-/Taktik-/Third-Person-Shooter
- Geschicklichkeitsspiele
- Multiplayer Online Battle Arena (MOBA)
- Hack'n'Slay
- Maze
- Shoot'em Up
- Beat'em Up
- anderes Actiongenre, bitte ausführen: _____

Strategie

- Aufbaustrategie/Wirtschaftssimulation
- Echtzeitstrategie
- Rundenbasiertes Strategiespiel
- anderes Strategiegenre, bitte ausführen: _____

Adventure

- Action-Adventure
- Action-Rollenspiel
- Text- und/oder Grafik-Adventure
- Rollenspiel
- Survival-Horror
- Simulation
- anderes Adventuregenre, bitte ausführen: _____

Andere Spielkategorien

- Bewegungsspiele
- Quiz

-
- Puzzle
 - Lernspiel
 - Wimmelbildspiel
 - sonstiges, bitte ausführen: _____

Welche allgemeinen Spielmechaniken kommen bei der Anwendung zum Einsatz?

- Achievements
- Boni
- Countdown
- Discovery (verborgene Schätze)
- Vielfalt/Updates/Neuerungen
- Levelsystem
- Ownership (Tamagotchi-Prinzip)
- Status (Rangsystem)
- Quests
- Lotterie (Zufallsprinzip)
- Appointments (zeitlich verpflichtende Logins)
- Combos
- Virtual Goods/Money
- Infinite Gameplay
- Punktesystem
- Progression
- Pacing
- sonstiges, bitte ausführen: _____
- keine

Welche sozialen Mechaniken kommen zum Einsatz?

- Freundschaften/Follower
- Nachrichtensysteme
- Möglichkeit, Lob und Anerkennung auszusprechen
- Gruppen

-
- Diskussionsforen
 - Community Collaboration
 - soziale Anbindung (Veröffentlichung von Erfolgen auf sozialen Plattformen)
 - sonstiges, bitte ausführen: _____
 - keine

Orientiert sich die Anwendung an einer fiktionalen oder realen Spielwelt?

- fiktional (Comicwelt etc.), bitte ausführen: _____
- realitätsbezogen (reale Stadt etc.), bitte ausführen: _____
- nicht relevant, da keine konkrete Spielwelt vorhanden ist

13 Analyse von Anwendungseigenschaften: Narrative Struktur II

Spielmodus

- Einzelspieler
- Mehrspieler (simultan)
- Mehrspieler (sukzedan)

Wird die reale Umgebung des Nutzers in die Anwendungshandlung mit eingeschlossen?

- Ja, durch Area-Based Gaming
- Ja, durch GPS-Daten
- Ja, durch Beschleunigungsdaten
- Ja, durch kartographische Daten
- Ja, durch Geocaching-Elemente
- Ja, und zwar durch: _____
- nein

Wie werden die Regeln/Anleitungen vermittelt?

- Textanleitung
- Anleitendes Tutorial/Vorlevel
- Sandkasten
- sonstiges, bitte ausführen: _____

-
- keine Regeln/Anleitungen

Was ist das Ziel der Anwendung?

- | | ja | nein |
|------------------------------------|--------------------------|--------------------------|
| Ist das Anwendungsziel vorgegeben? | <input type="checkbox"/> | <input type="checkbox"/> |
| Ist das Ziel modifizierbar? | <input type="checkbox"/> | <input type="checkbox"/> |
| Ist das Ziel frei wählbar? | <input type="checkbox"/> | <input type="checkbox"/> |

14 Anwendungsziel

Wie lassen sich die Ziele der Anwendung beschreiben? _____

15 Analyse von Anwendungseigenschaften: soziodemografischer Ausgang

Ist die Identifikationsfigur/der Avatar an die soziodemografische Ausgangssituation der Nutzer anpassbar?

- ja, an das Geschlecht
- ja, an das Alter
- ja, an den kulturellen Hintergrund
- ja, an gesundheitliche Beeinträchtigungen
- ja, an den sozioökonomischen Status
- nein
- nicht relevant, da kein Avatar vorgesehen ist

Ist die Benutzeroberfläche (Musik, Interface etc.) an die soziodemografische Ausgangssituation der Nutzer anpassbar?

- ja, an das Geschlecht
- ja, an das Alter
- ja, an den kulturellen Hintergrund
- ja, an gesundheitliche Beeinträchtigungen
- nein

Ist die Anwendungsumgebung (z.B. Welt, in der man sich bewegt) an die soziodemografische Ausgangssituation der Nutzer anpassbar?

- ja, an das Geschlecht
- ja, an das Alter

-
- ja, an den kulturellen Hintergrund
 - ja, an gesundheitliche Beeinträchtigungen
 - ja, an den sozioökonomischen Status
 - nein
 - nicht relevant, da keine Spielwelt vorhanden ist

Ist die Handlung an die soziodemografische Ausgangssituation der Nutzer anpassbar?

- ja, an das Geschlecht
- ja, an das Alter
- ja, an den kulturellen Hintergrund
- ja, an gesundheitliche Beeinträchtigungen
- ja, an den sozioökonomischen Status
- nein

16 Rolle der Nutzer

Welche Gimmicks/Sammelgegenstände sind unabhängig vom Anwendungsverlauf erhältlich?

- Kleidung
- Schmuck
- Waffen
- Bewegungen (Sprünge, Tanzschritte etc.)
- sonstige, bitte ausführen: _____
- keine

Welche Rolle haben die Nutzer in der Anwendung?

- keine definierte Rolle
- vorgegebene Spielfigur
- eigener Avatar

Werden die Nutzer durch entsprechende Aufgaben zur Nutzung kreativer Verfahren und Erstellung kreativer Produkte angeregt? (z.B. creative writing/speaking activities wie eigene Videos/Animationen/Fotostories erstellen etc.)

- ja, bitte ausführen: _____
- nein

17 Avatar

Welche Möglichkeiten haben die Nutzer mit dem Avatar?

- freie Gestaltung des Avatars
- erspielbare/käufliche Gegenstände für den Avatar
- sonstiges, bitte ausführen: _____

18 Multimediale Gestaltung I

Wie stark stimmen Sie den folgenden Einschätzungen zu?

	überhaupt nicht	eher nicht	teils-teils	eher ja	absolut	keine Angabe
Der Bildschirm- aufbau ist insge- samt übersicht- lich.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Die Grafiken sind verständ- lich.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Auditive Ele- mente sind verständlich.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Animationen sind verständ- lich.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verschiedene mediale For- men werden für Fremdsprachen- lernen sinnvoll in Kombination eingesetzt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Bitte beantworten Sie folgende Fragen:

	ja	nein
Nutzer können selbst eigene multimediale Inhalte in das Programm integrieren.	<input type="checkbox"/>	<input type="checkbox"/>
In die Anwendung sind authentische Internetmaterialien eingebaut.	<input type="checkbox"/>	<input type="checkbox"/>

Welche Maßnahmen zur Barrierefreiheit können genutzt werden?

- individuelle Anpassung von Schrift- und Bildgrößen
- individuelle Anpassung der Kontrastschärfe
- individuelle Anpassung der Lautstärke
- separate Anpassung der Hintergrundgeräusch-Lautstärke

-
- Informationsvermittlung nicht allein über Farben (z.B. für Menschen mit Rot-Grün-Sehschwäche sondern zusätzliche Symbole wie Häkchen und Kreuze)
 - Sprachausgabe von Texten
 - Untertitelung von Sprache
 - visuelle Unterstützung von Geräuschen
 - Deaktivierung von blinkenden/animierten Texten
 - Steuerung wahlweise über verschiedene Methoden
 - Nutzung technischer Standards zur fehlerfreien Darstellung auf verschiedenen Endgeräten und in verschiedenen Browsern
 - sonstiges, bitte ausführen: _____
 - keine

19 Didaktische Interaktion

Werden vor der Nutzung persönliche Daten erhoben, die für die dynamische Anpassung der Anwendung genutzt werden?

- ja, Alter
- ja, fremdsprachliche Kompetenzen
- ja, Lerngewohnheiten
- ja, Spielerfahrung
- ja, inhaltliches Interesse
- sonstiges, bitte ausführen: _____
- nein

Gibt es einen sprachlichen Einstufungstest zu Beginn?

- ja, bitte ausführen: _____
- nein

Passt sich die Anwendung den Nutzern an?

- ja, durch aktive Auswahl
- ja, indirekt im Anwendungsverlauf
- nein

20 Anwendungsanpassung

Wie passt sich die Anwendung an die Nutzer an?

- inhaltlich
- Schwierigkeitsgrad
- Lernstil
- sonstiges, bitte ausführen: _____

21 Didaktische Interaktion II

Sind die Aufgabenstellungen, Ziele der Übung und Aufgaben der Anwendung schnell verständlich?

- ja, bitte ausführen: _____
- nein

Welche geschlossenen Aufgaben-/Übungstypen werden angeboten?

- Multiple-Choice
- Richtig-Falsch Übungen
- Lückentexte oder allgemein Formate mit vorgegebenen Antwortmöglichkeiten
- Zuordnungsaufgaben (z.B. Drag and Drop, geschriebene Wörter Bildern zuordnen, Zuordnen zu einer bestimmten Kategorie wie „flüssig“ oder „gas“ etc.)
- Sortierübungen (z.B. Satzteile in die richtige Reihenfolge bringen)
- Listen & Click Übungen
- Worträtsel
- sonstiges, bitte ausführen: _____
- keine

Welche halboffenen fremdsprachlichen Aufgaben-/Übungstypen werden angeboten?

- Übungen mit freier Texteingabemöglichkeit (z.B. Sätze vervollständigen)
- Lückentexte oder allgemein Formate mit offener Texteingabemöglichkeit
- Informationen aus einem Text/Audio/Video ermitteln, ordnen und/oder vergleichen
- sonstiges, bitte ausführen: _____
- keine

Welche offenen fremdsprachlichen Aufgaben-/Übungstypen werden angeboten?

-
- Rechercheaufgaben (z.B. Internetrecherche etc.)
 - (handlungsorientierte) Kommunikation mit virtuellen Charakteren in der Spielwelt/dem Programm (z.B. über text- oder Spracheingabe)
 - (handlungsorientierte) Kommunikation mit anderen Nutzern oder Tutoren (z.B. über Text-/Audio- oder Videocharts)
 - Aufgaben für kollaboratives Arbeiten (z.B. gemeinsame Texte verfassen im Wiki)
 - Aufgaben im Bereich entdeckendes Lernen in einem rich learning environment (z.B. „Geh in der Supermarkt und hör dir an, worüber die Leute reden.“)
 - Aufgaben im Bereich des aktiven Problemlösens innerhalb der Spielhandlung unter Verwendung der Fremdsprache (z.B. ein Brief, der durch Regentropfen nicht mehr lesbar ist und rekonstruiert werden muss oder ein nur in Teilen verständliches Telefonat, das man inhaltlich rekonstruieren muss)
 - Erstellung kreativer Produkte (kreatives Schreiben, Video- und Animationserstellung etc.)
 - sonstiges, bitte ausführen: _____
 - keine

22 Didaktische Interaktion II

Welche Formen des Feedbacks bietet die Anwendung an?

- akustisches Feedback (z.B. Musik, Applaus etc.)
- visuelles Feedback (z.B. Häkchen, Bilder, Animationen etc.)
- schriftliches Feedback (z.B. „Richtig!“, „Sehr gut!“ etc.)
- durch Extras (z.B. Gimmicks, Freischalten von weiteren Levels)
- implizites Feedback (z.B. „Sieh dir noch einmal die Regeln zu Konditionalsätzen an.“)
- explizites Feedback (z.B. „So wird das Wort richtig geschrieben: ...“)
- Feedback nach jeder Antwort
- Feedback am Ende einer Antwortsequenz
- je nach Voreinstellung des Nutzers
- sonstiges, bitte ausführen: _____

Tauchen inhaltliche Probleme oder Fehler auf?

- ja, bitte ausführen: _____

nein

Wird der Bearbeitungsstand regelmäßig automatisch gespeichert?

ja

nein

Werden die Nutzer über ihren Lern-/Arbeitsfortschritt informiert bzw. können Informationen dazu abgerufen werden?

ja, bitte ausführen: _____

nein

Welche Hilfs- und Informationsangebote (bei auftauchenden sprachlichen Fragen und Problemen oder bei Fragen zur Gestaltung des Lernprozesses sind in die Anwendung integriert?

integriertes Wörterbuch

Grammatikerklärung

Beispiele

Tipps

Tutorials

sonstiges, bitte ausführen: _____

keine

Welche weiteren Hilfs-/Informationsangebote außerhalb der Anwendung können in Anspruch genommen werden?

Kontakt mit Lehrkraft/Tutor

Hilfeportal im Internet

Austausch in einer Nutzercommunity (z.B. Foren, Facebook etc.)

sonstiges, bitte ausführen: _____

keine

23 Steuerungsinteraktion

Welche Formen der Steuerung/Eingabe sind möglich?

- Tastatureingabe
- Berührungseingabe
- Steuerung mit Maus
- Sprachsteuerung
- Sensoren der Mobilgeräte (Beschleunigungssensor, GPS, Gyroskop, Helligkeit etc.)
- sonstiges, bitte ausführen: _____

Erlaubt die Anwendung schnelle und intuitive Navigation?

- ja, bitte ausführen: _____
- nein, bitte ausführen: _____

Können die Navigationselemente angepasst werden (z.B. Größe, Icons mit und ohne Text, komplett ausblenden, Platzierung selbst bestimmen)?

- ja, bitte ausführen
- nein

Gibt es Hilfsangebote für den Bereich Anwendungssteuerung? (z.B. Erklärvideos, Tool-Tips, Animationen, Intro-Levels etc.)

- ja, bitte ausführen: _____
- nein

Tauchen Steuerungs-/Bedienungsprobleme auf?

- ja, bitte ausführen: _____
- nein

24 Wissenschaftliche Fundierung

Basiert die Anwendung auf einer theoretischen Basis/einer Interventionstheorie?

- ja, bitte ausführen: _____
- nein

Wie ist die Anwendung entstanden (basierend auf Herstellerangaben und Recherche)?

- in Kooperation mit einem Wissenschaftspartner (z.B. Universität), bitte ausführen:
- alleine durch eine Anwendungsentwicklungsfirma, bitte ausführen: _____

sonstiges, bitte ausführen: _____

Existieren wissenschaftliche Publikationen zur Anwendung (peer received, Buchbeiträge, populärwissenschaftliche Beiträge)?

ja, bitte ausführen: _____

nein

Wurde eine Ergebnisevaluation zur Anwendung durchgeführt?

ja, bitte ausführen: _____

nein

Sind statistisch signifikante positive Effekte berichtet?

ja, bitte ausführen: _____

nein

Wurde ein Follow-up durchgeführt? Wenn ja, welche Effekte werden über einen längeren Zeitraum berichtet?

ja, bitte ausführen: _____

nein

25 Abschlussfrage

Gibt es zusätzliche Erkenntnisse zur Anwendung, welche an anderer Stelle nicht abgefragt wurden?

ja, bitte ausführen: _____

nein

8.2 Appendix B: Survey of pre-service EFL teachers' media-related attitudes and experiences

Survey of Pre-Service EFL Teachers' Media-Related Attitudes and Experience

Dear Student: As a doctoral student at Leuphana, I am studying the use of computers in EFL instruction. This survey is intended to gather information about teacher candidates' use of different media and how this relates to English language acquisition, knowledge, learning strategies, and use. The responses from the survey will be used to inform my research on this topic.

The survey should take you approximately 20 minutes to complete. Your responses are anonymous. Your participation is voluntary, but you might find that completing the survey will help you reflect on your own ideas about teaching and learning English. When the survey is completed, I will be happy to share the results with you if you are interested.

Thank you for taking the time to answer these questions thoughtfully! C. Blume

There are 37 questions in this survey.

While your responses are anonymous, a follow-up survey is anticipated. In order to compare your responses on the two surveys, you need to create an identifying code that is (1) unique to you and (2) that you can remember over the course of the semester. Please therefore fill in the code as follows:

MOTHER'S FIRST INITIAL/ YEAR YOUR BIRTH/ FIRST INITIAL OF YOUR BIRTHPLACE/ YOUR FIRST INITIAL

*

Please write your answer here:

e.g.

Mother's name: Heike/ Your birthyear: 1989/ Your place of birth: Lüneburg/ Your name: Jonas
H1989LJ

At what age did you begin learning English?

● Choose one of the following answers

Please choose **only one** of the following:

- Birth-5
 6-10
 11-15
 16 or older
 Other

If one or more of your parents are native English speakers and/or they spoke English to you most of the time, you would select "Birth- 5." Please also select this answer if you were born in an English-speaking country, and spent most of your first few years living there.

Have you lived in an English-speaking country?

Please choose **only one** of the following:

- Yes
 No

In this context, "English speaking" means a country where the primary daily means of communication is English, i.e. in schools, in public, in bureaucracies, on signs, in informal communication. It may be one of two or even three primary languages, but it should be spoken on a daily basis. Please answer "no" to this question if you were only there as a visitor, and "yes" if you lived there for school, work, etc.

Please indicate how long you lived in this country:

Only answer this question if the following conditions are met:

Answer was 'Yes' at question '3 [Country]' (Have you lived in an English-speaking country?)

● Choose one of the following answers

Please choose **only one** of the following:

- 5 months or less
 6 months - 1 year
 1-2 years
 3 years or more
 Other

If you lived in more than one English speaking country, or you lived in one intermittently, please add all of these instances together.

For example: Roger was born in the US, and returned to Germany when he was 4 months old. His parents moved to England when he was a year old, and then they moved to India when he was two. They lived there for a year before returning to Germany, where they still live. Roger went on an exchange program to Australia when he was 15 for one semester.

His total time in an English-speaking country was 3 years or more.

Do you speak any additional languages fluently?

Please choose **only one** of the following:

- Yes
 No

"Fluently" assumes knowledge beyond the B1 level. Some indicators of fluency might be that you can use the language in daily conversation; you can conduct a purchase in the language; you can read an age-appropriate book; you use the language outside of school.

Please indicate what other language(s), besides English and German, that you speak fluently.

Only answer this question if the following conditions are met:

Answer was 'Yes' at question '5 [Multilingual]' (Do you speak any additional languages fluently?)

In this case, "fluently" means that you use the language outside of school for regular activities, e.g. speaking with relatives or friends, reading, communicating with strangers, conducting work, etc.

Do you have previous teaching experience?

Please choose **only one** of the following:

- Yes
 No

Please indicate the type of teaching experience you have. Choose all that apply.

Only answer this question if the following conditions are met:

Answer was 'Yes' at question '7 [Experience]' (Do you have previous teaching experience?)

☛ Check all that apply

Please choose **all** that apply:

- pre-primary (nursery or kindergarten)
 primary school (Gr 1-4)
 secondary school (Gr 5-13)
 post-secondary school (college, technical college, university)
 adult education (VHS, Weiterbildungsinstitut)
 tutoring one-to-one (Einzelnachhilfe)
 tutoring in small groups (Nachhilfeunterricht)
 language school
 vocational school
 vacation camp

Other:

Please indicate the level(s) you taught. You may select more than one response.

Where did you teach English?

Only answer this question if the following conditions are met:

Answer was 'Yes' at question '7 [Experience]' (Do you have previous teaching experience?)

☛ Comment only when you choose an answer.

Please choose all that apply and provide a comment:

In Germany

In an English-speaking country

Other:

Which of the following practica have you completed in your teacher training program at Leuphana?

☛ Check all that apply

Please choose **all** that apply:

- Sozial- und Betriebspraktikum
 Schulpraktische Studien 1 (SPS1)
 Schulpraktische Studien 2 (SPS2)
 Praxisphase GHR300 (fünfmonatiges Praktikum im Masterstudium)
 Schulische Praxisstudien Bachelor LBS
 Schulische Praxisstudien Master LBS
 I have not yet completed any practica.
 I have completed teacher training/practica elsewhere.

Where did you complete your teacher training prior to your studies at Leuphana?

Only answer this question if the following conditions are met:

Answer was at question '10 [Teachertraining]' (Which of the following practica have you completed in your teacher training program at Leuphana?)

🗳️ Check all that apply

Please choose **all** that apply:

- In an English-speaking country.
- In a country other than Germany that did not have English as a primary language.
- At another location in Germany.

How would you characterize the type of teacher training you had?

Only answer this question if the following conditions are met:

Answer was at question '10 [Teachertraining]' (Which of the following practica have you completed in your teacher training program at Leuphana?)

🗳️ Check all that apply

Please choose **all** that apply:

- I was trained to teach English at another university.
- I was trained to teach English in a certificate program (CELTA, TEFL, TESOL, etc.)
- Other:

If you attended another college or university prior to Leuphana, and were enrolled in a teacher-training course of study there, please answer this question with the first answer choice. If you attended another type of training program, such as a training to earn a CELTA, TEFL or TESOL certificate, please select the second option. If you are a "Quereinsteiger" or have a different type of training, please select the third choice.

Please choose the option that best describes the type of teaching position you held.

🗳️ Check all that apply

Please choose **all** that apply:

- Regularly employed and salaried teacher (Regulär eingestellte und vergütete Lehrkraft)
- Substitute teacher (Vertretungslehrkraft)
- Trainee (Referendar o.ä.)
- Other:

If you were paid for your work, either with money or services (i.e. housing or food), please select the first option. If you only have teaching experience within the framework of your education to become a teacher, please select the third option.

In this question, please think back to your own experiences as a student in school before coming to university. Please consider grades 7 through 13.

Please choose the appropriate response for each item:

	Frequently. I did this over the course of several years in English class, every two or three weeks.	Regularly. I did this over the course of one or more years in English class, every few weeks, or at least once a month.	Rarely. I did this over the course of one or two years in English class, once every few months.	Never. I did this once or twice in my entire school career in English class.	I don't know/I can't remember
We used educational software on CD-ROM or on the Internet to learn English (e.g. Phase 6, English Coach)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We listened to English-language podcasts or streamed spoken-word material (e.g. lectures or interviews) in English class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We listened to English-language music or watched music videos (e.g. using YouTube or Spotify) in English class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We conducted Internet-based research or completed research projects using web-based resources in English class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We completed Webquests in English class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We had email/chat/social media "e-penpals" in English class (native speakers or other English students).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We watched English-language videos or movies with an Internet service (e.g. YouTube or Hulu) in English class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We made our own English-language videos for the Internet as a class assignment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We researched English grammar and vocabulary using online reference sites in English class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We played English-language games using CD-ROMs or the Internet in English class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We wrote English-language texts using text-based programs (e.g. Word) in English class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In what other way(s) did you use computers in your English class as a student?

Only answer this question if the following conditions are met:

Answer was 'Frequently, I did this over the course of several years in English class, every two or three weeks,' or 'Regularly, I did this over the course of one or more years in English class, every few weeks, or at least once a month,' or 'Rarely, I did this over the course of one or two years in English class, once every few months.' at question '14 [Student]' (In this question, please think back to your own experiences as a student in school before coming to university. Please consider grades 7 through 13.)

Please write your answer here:

If you used computers in your English classes for a purpose not described in the previous question, please describe briefly here.

Please assess your English skills as best you can.

Please choose the appropriate response for each item:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	I don't know/can't answer
I can interact with enough fluency and spontaneity that makes regular interaction with native speakers possible.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can express myself fluently and spontaneously without much obvious searching for expressions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can take part effortlessly in any conversation or discussion and have a good familiarity with idiomatic expressions and colloquialisms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can take an active part in discussion in familiar contexts, accounting for and sustaining my views.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can use language flexibly for social and professional purposes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can formulate ideas and opinions precisely and relate my contribution to those of other speakers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can express myself fluently and convey finer shades of meaning precisely.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can fill in different kinds of applications in English (e.g. credit card applications).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can understand when two English speakers talk at a normal speed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can understand a message in English on an answering machine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can understand the meaning of common idiomatic expressions used by English speakers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can talk in English about cultural themes and norms in the U.S., Great Britain, Australia, or other English-speaking countries.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can apply a grammatical rule to use a word or phrase correctly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can manage a situation like an undeserved traffic ticket or financial responsibility to damage to someone else's belongings, or discuss who is to blame regarding an accident.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can speak with a customer service representative about a problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can request a refund for a product or purchase.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can interact appropriately with authorities, such as police or immigration officers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can sustain relationships with native speakers without unintentionally amusing or irritating them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can make appropriate jokes and use humor appropriately.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can convey degrees of emotion and discuss the personal significance of events and interactions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What are three areas where you think your English skills need improvement?

Please feel free to address anything mentioned in the previous question, or write your own description based on competencies, key words, concepts, or areas of interest.

Please assess your strategies for learning English as best you can.

Please choose the appropriate response for each item:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	I don't know/can't answer
I have different ways to practice and improve my English skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to accurately assess my own strengths and weaknesses in English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use necessary strategies to help maintain a conversation with an English speaker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use different methods of memorizing words, phrases, or grammatical constructions or rules.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to figure out the meaning of unknown words in English from the context.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I ask for clarification or an example if I am not sure I understand something in English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I act appropriately in social English-speaking situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I correct myself or others when it is appropriate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In this question, you are being asked about the strategies you use to learn and improve your own English language skills.

What type of cell phone do you use most frequently?

Please choose all that apply:

- iOS
 Android
 Windows
 A phone that only makes calls/sends texts
 I don't own a cell phone.

Other:

If you use more than one cell phone type on a regular basis, you may check all that apply.

How often do you do the following?

Please choose the appropriate response for each item:

	Frequently (once or more a week)	Regularly (once every two or three weeks)	Occasionally (once or twice per month)	Rarely (less than once per month)	Never
I use the computer to look up English grammar, vocabulary, or spelling.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use the computer to play German-language games on CD-ROM or with a browser.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use the computer to play English-language games on CD-ROM or with a browser (e.g. Minecraft, The Sims).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use educational programs on the computer to improve my English (e.g. Phase 6, Duolingo).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use my cell phone to look things up on grammar sites or dictionaries.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use an educational app on my cell phone to improve my English (e.g. Duolingo, Mindsnacks, Rosetta Stone).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use an automatic translator app on my cell phone.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I play games in German on my cell phone.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I play games in English on my cell phone.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please list any educational apps, for any topic (not just English), that you have installed on your phone.

	App Name	App Name	App Name	App Name
I have used this app in the last month.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
I haven't used this app in the last month.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
It's on my cell phone, but I have never used this app.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

"Educational apps" are apps for learning or improving skills. You might have some apps to learn English or another language, like Duolingo or Busuu. Or maybe you have an app to help you learn math or science formulas. Maybe you have apps that help children learn to read and write. There are apps to teach speed reading, drawing, memorizing, astronomy, music, etc.

Please list any games installed on your phone (not just English language ones).

	Game name	Game name	Game name	Game name	Game name
I have played this game in the last month.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
I haven't played this game in the last month.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
I have never played this game.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

State the degree to which you agree or disagree with the following statements.

Please choose the appropriate response for each item:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	I don't know/can't answer.
Computer games can teach students authentic English language usage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using computer games in English class would be motivating to my students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning to play and playing computer games in English class is too time-consuming.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know about computer games I can use for teaching English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are no good computer games for teaching English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using computer games would make students think that learning should be fun, rather than hard work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The financial cost of incorporating computer games and apps in English class will cause problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incorporating computer games and apps will improve my English instruction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is too complicated to make sure the technology will work right to use computer games in the English classroom.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer games in English class are only good for drilling vocabulary or grammar rules.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Did you use technology in your classroom when teaching English?

Only answer this question if the following conditions are met:

Answer was 'Yes' at question '7 [Experience]' (Do you have previous teaching experience?)

Please choose **only one** of the following:

- Yes
 No

Please indicate which of the following you used in instruction.

Only answer this question if the following conditions are met:

Answer was 'Yes' at question '7 [Experience]' (Do you have previous teaching experience?) and Answer was 'Yes' at question '24 [Useoftech]' (Did you use technology in your classroom when teaching English?)

Please choose the appropriate response for each item:

	Frequently (more than three times during the semester).	Regularly (two or three times during the semester).	Rarely (once).	Never.	I don't know/I can't remember.
My students used educational software on CD-ROM or on the Internet to learn English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students listened to podcasts or streamed spoken-word material in English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students listened to English-language music or watched music videos with e.g. YouTube, Spotify.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students conducted Internet-based research/research projects using Web-based resources in English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students had email/chat/social media "e-penpals" in English (native speakers or other English-language learners).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students watched videos or movies with e.g. YouTube or Hulu or another Internet-based service (not DVDs).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students made their own videos and uploaded them to the Internet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students completed Webquests in English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students researched grammar and vocabulary online using reference sites in class or as directed by me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students played English-language games using CD-ROMs or the Internet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students wrote texts using text-based programs (e.g. Word) in English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students used concordance tools or corpora (e.g. AntConc, British National Corpus).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My students used the computer in other ways during English class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain why you did not use technology during your English teaching. Multiple responses are possible.

Only answer this question if the following conditions are met:

Answer was 'No' at question '7 [Experience]' (Do you have previous teaching experience?) and Answer was 'No' at question '24 [Useoftech]' (Did you use technology in your classroom when teaching English?)

Please choose all that apply:

- There were limited technology-based tools available (no laptops/desktops; equipment was broken or functioned poorly; Internet was slow or unavailable).
- Access to technology-based tools was too complicated (All computer rooms/laptop carts were occupied or hard to get to; log-ins were not made readily available; a technician or support person had to be present or was not present when required).
- The cooperating teacher/supervisor preferred that I following the textbook/existing curriculum.
- The students were too difficult to manage.
- The available programs and applications did not meet my curricular needs.
- I didn't have time to prepare technology-based lessons.
- I didn't feel confident enough using technology for instruction.
- I was concerned the technology would not work correctly.
- I didn't feel technology was helpful, useful, or necessary for what I wanted to teach.
- I'm not familiar with any relevant programs or applications for what I'm teaching.
- Other:

When you are a teacher, which of the following factors will you consider when choosing technology-based media to use in the classroom?

Please choose the appropriate response for each item:

	Strongly agree.	Agree.	Neither agree nor disagree.	Disagree.	Strongly disagree.	I don't know/can't answer.
It depends on the opinions of my future colleagues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It depends on the opinions of my future supervisor(s).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It depends on the preferences of my future students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It depends on the opinions of students' parents.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It depends on whether the activity is aligned to the Common European Framework.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It depends on whether the activity prepares students for leaving exams (e.g. Mittlere Reife).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It depends on whether the activity prepares students for comparative exams (e.g. VERA).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It depends on whether I enjoyed it as a student.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It depends on how much preparation it requires.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It depends on whether it motivates the students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It depends on whether the technology is available at the school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It depends on other factors.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain why you did not use technology in your classroom.

Only answer this question if the following conditions are met:

Answer was 'No' at question '24 [Useoftech]' (Did you use technology in your classroom when teaching English?)

Please write your answer here:

Please indicate what additional factors will determine whether or not you will use technology to teach English.

Only answer this question if the following conditions are met:

Answer was 'Strongly agree.' or 'Agree.' at question '27 [Techteacher]' (When you are a teacher, which of the following factors will you consider when choosing technology-based media to use in the classroom? (It depends on other factors.))

Please write your answer here:

If you indicated other factors would determine your use of technology to teach English when you become a teacher, please briefly describe or list what those factors might be.

Please describe any other ways you used the computer in teaching English classes.

Only answer this question if the following conditions are met:

Answer was 'Frequently (more than three times during the semester).' or 'Regularly (two or three times during the semester).' at question '25 [Techusage]' (Please indicate which of the following you used in instruction. (My students used the computer in other ways during English class.))

Please write your answer here:

If you used the computer with your students in ways not described in the previous question, please describe these briefly here.

Please briefly explain whether or not you would use computer games/apps to teach English in class. Please name any games and how/why you would use them. If you would not use any computer games/apps in English class, please explain why.

Please write your answer here:

Please identify your age range.

Please choose **only one** of the following:

18-22

23-29

30-35

Other

What is your gender?

Please choose **only one** of the following:

Male

Female

Other

What semester and course of study are you in?

Please choose **only one** of the following:

1st Semester B.A.

2nd Semester B.A.

3rd Semester B.A.

4th Semester B.A.

5th Semester B.A.

6th Semester B.A.

7th Semester B.A.

8th Semester B.A.

1st Semester M.Ed.

2nd Semester M.Ed.

3rd Semester M.Ed.

4th Semester M.Ed.

5th Semester M.Ed.

6th Semester M.Ed.

Other

Please list the semester you are in for this course of study. If you have a degree in another subject, or began studying another subject and later switched to this one, please do not consider that time for the this question.

What qualification are you pursuing?

Please choose **only one** of the following:

- Elementary or secondary education (Grund-, Haupt- und Realschullehramt)
- Vocational (Berufsschullehramt)
- Other

Please indicate what "Lehramt" you are studying for, if any. If you are not studying "auf Lehramt," please choose "other."

If you have any comments on any of the topics in this survey, information you think would be helpful, or need to clarify an answer you gave, please feel free to do so here.

Please write your answer here:

In future stages of this study, participants will have the opportunity to test a new language learning app and give feedback on it. If you are interested in testing the app, please supply an email address below. If you prefer not to give an email address, but you are interested in testing the app, you can send me an email at cblume@leuphana.de.

Please write your answer here:

Thank you for taking the time to complete this survey! Your cooperation is appreciated. If you are interested in the results of the survey, please contact me at cblume@leuphana.de.

Submit your survey.

Thank you for completing this survey.

8.3 Appendix C: Table of Articles

#	Publication	Status	Indicators of publication quality	Author's role	Conference presentations
An imperfect union? Enacting an analytic and evaluative framework for digital games for language learning					
1	<i>Zeitschrift für Fremdsprachenforschung</i>	Published 2017	<ul style="list-style-type: none"> - Double-blind peer review journal - Publication of the Deutsche Gesellschaft für Fremdsprachenforschung (DGFF), the primary professional organization of foreign language didactics in Germany <p>http://www.dgff.de/publikationen/zff/</p>	Initial (co-) author*	Schmidt, T., & Blume, C. (2015, September). <i>Learning through play? Evaluating digital games for language learning</i> . Deutsche Gesellschaft für Fremdsprachenforschung. 26. Kongress: Sprachen lehren, Ludwigsburg, Germany (CFP for 2019: http://kongress.dgff.de/call-for-papers/cfp/)
Games people (don't) play: An analysis of pre-service EFL teachers' behaviors and beliefs regarding digital game-based language learning					
2	<i>Computer Assisted Language Learning</i>	In press; January 2019	<ul style="list-style-type: none"> - Double-blind peer review journal - IJR Impact factor: 1.928 (2017) - Ranking: 20/181 (Linguistics) 58/238 (Education & Educational Research) - Computer science applications: best quartile (Q1) - SJR reported impact factor: 1.34 (2017) - No acceptance rate reported <p>https://www.tandfonline.com/action/journalInformation?show=aimsScope&journalCode=NCAL</p> <p>https://www.scimagojr.com/journalsearch.php?q=144747&tip=sid&clean=0</p>	Single author	Blume, C. (2017, March). <i>Pre-service language teachers as pre-digital learners in the context of DGBLL; A survey of digital tools and attitudes</i> . Department of English and American Studies of the LMU. Media Literacy in Foreign Language Education: Digital and Multimodal Perspectives, München, Germany (CFP for 2019: https://www.tefl.anglistik.uni-muenchen.de/conference-global-education/index.html#call-for-papers)

Playing by their rules: Why issues of capital (should) influence digital game-based language learning in schools					
3	<i>CALICO Journal</i>	Published January 2019	<ul style="list-style-type: none"> - Double-blind peer review journal - Article acceptance rate between 20%-30% - Referred to as a “major CALL journal,”^a one of the “Top 5”^b in English Foreign Language Research & Teaching - No impact factor reported <p>https://education.byu.edu/sites/default/files/EDLF/documents/EDLF_Journal_Tier_Ranking_Approved.pdf</p> <p>http://www.aritzhaupt.com/resources/academic-journals/</p> <p>^ahttps://www.cambridge.org/core/journals/recall/information/instructions-contributors</p> <p>^bhttps://eltjam.com/5-useful-online-journals-for-elt-professionals/</p>	Single author	Blume, C. (2018, October). <i>A reversal of fortunes; Digital game-based language learning as a social justice issue</i> . ACTA Australian Council for TESOL Associations. Annual Conference: English Language Learning in a Mobile World, Adelaide, Australia (https://www.conveneit.com/secure/onsite/acta_2018/)

*Elaboration regarding the role of the candidate for the co-authored article, “An imperfect union? Enacting an analytic and evaluative framework for digital games for language learning.”

Component of the article	Carolyn Blume	Co-author Torben Schmidt	Co-author Inke Schmidt
Conception of the research	30%	40%	30%
Development of the research methods	35%	30%	35%
Data collection and preparation	45%	10%	45%
Data analysis	60%	20%	20%
Article writing	90%	10%	-
Article submission, revision, and formatting	90%	-	10%