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The use of computer games as foreign language learning tasks for digital natives



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ABSTRACT

Although children's use of computer games as tools for learning foreign languages (FL) is on the rise, we know little about which game elements aid in the FL-learning process. Adhering to Pinter's (2014) call for conducting *research with children* as opposed to *research on children*, this study asked children working in groups to design computer games to help them learn FL vocabulary. Our aim was to better understand the elements and structures that, *from children's points of view*, are both attractive and effective for FL learning.

The participants were 82 sixth-grade students (11–12 year olds) enrolled in a public primary school in Japan. The children first discussed and identified game elements and vocabulary learning elements while examining existing games. Next, they worked in groups to design computer games based on the elements they identified, presented the game designs in class using storyboards, and evaluated their own game designs and those of their peers. The children identified 16 game elements and 8 learning elements. Among the learning elements the children identified were repeating/reviewing, using multiple modalities and means, and having control over their own learning. Game elements valued by the children included challenging, fantasies, self-control, instant feedback, and applause.

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1. Introduction

Computer games have gained attention in recent years as potentially effective learning tools. Games that are specifically designed for educational purposes are sometimes referred to as *serious games* or *instructional games*, and they are distinguished from games that are purely for entertainment (Ma, Oikonomou, & Jain, 2011; Sørensen & Meyer, 2007). The major potential benefits of using games for instruction include that (a) they can be adapted to meet the needs of learner-centered approaches to learning, where learners have greater autonomy over their own learning; (b) they can help learners understand complex subject matters; and (c) they can enhance the motivation for learning among intense computer users (Garris, Ahlers, & Driskell, 2002).

Computer-based instructional games (referred to as CBIGs hereafter) appear to be particularly promising for children who are familiar with computer games from an early age.¹ While CBIGs appear promising, we have limited knowledge about the extent to which and the ways in which they can assist children in their learning. What kinds of tasks in CBIGs can enhance student motivation and learning? What are the underlying game and learning elements in those tasks? Answers to these questions are particularly scarce in the context of foreign language (FL) education, despite the prevalence of various types of computer-game-based materials and tasks for FL learning among children.

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¹ Consistent with previous research, in this study the terms *children* and *young learners* refer to individuals who are still in primary school or are up to 12 years old.

In order to make CBIGs effective, it is critical to identify game features that promote learning. Indeed, almost 30 years ago [Lepper \(1985\)](#) noted the importance of identifying such game features. However, our current understanding of this topic remains limited. Existing empirical studies, mostly conducted in math and science education contexts, have shown inconsistent results, leading [Garris et al. \(2002\)](#) to state that “there is little consensus on game features that support learning, the process by which games engage learners or the types of learning outcomes that can be achieved through game play” (p. 442). In reality, many professional game makers seem to design “fun” and “effective” instructional games primarily based on their own intuitions and experiences, but the elements that they believe to be fun and effective may not necessarily be the same elements that digital-native children would identify as such.

Adhering to the call for conducting “research *with* children” as opposed to “research *on* children” ([Pinter, 2014](#)), this project asked children working in groups to develop computer game ideas for their effective FL vocabulary learning. Based on the game ideas that the children came up with, a professional game designer made a game, and another group of children evaluated its effectiveness. By examining the children’s negotiation processes and final proposed game plans as well as their evaluation results, the project aims to better understand the elements that are both attractive and effective for children’s FL learning—from the children’s point of view. Due to space constraints, this paper focuses on the analysis of the final game plans proposed by the children.

The present study targeted vocabulary learning because learning words for familiar objects and events as well as simple communicative expressions was a major component of the English lessons at the primary school where this study was conducted. Moreover, it has been suggested that vocabulary learning, which can easily become a boring rote memorization activity, should be a more enjoyable and effective activity through CBIGs ([Prensky, 2001](#)). Indeed, online tools for vocabulary learning are already relatively common among children, although they mostly consist of simple mechanical drills ([Wood, 2001](#)). [Sylvén and Sundqvist \(2012\)](#) reported that online game playing frequency correlated with higher vocabulary performance among Swedish children learning English (ages 11–12).

Although the task engaged in by the children in this project (i.e., designing computer games for FL vocabulary learning) was not directly intended to assist their learning of subject content (e.g., math and science) in the target FL, it was designed to help them to reflect on their own FL-learning strategies and to engineer the results of their reflections in a game format. This game development project was conducted during the “integrated study” portion of the Japanese national curriculum, which aims to deepen children’s understanding of topics (chosen by teachers) through experiential learning and using a multidisciplinary approach.

2. Literature review

2.1. The role of social interaction and play in children’s development

This study is based on [Vygotsky’s \(1978\)](#) sociocultural theory, which centralizes the role of social interaction in children’s mental development. Vygotsky proposed the concept of the *zone of proximal development* (ZPD), which he defined as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (p. 86). If a child is at his or her ZPD for a particular task and can receive appropriate assistance and feedback from capable others, the child can reflect the gaps in the current and potential conception levels and advance to achieve the task; learning through guided social interaction triggers one’s internal mental development.

Play is an important part of children’s development of mental representation because, according to [Vygotsky \(1978\)](#), it creates the ZPD for the child. Vygotsky indicated that “play contains all developmental tendencies in a condensed form and is itself a major source of development” (p. 102). Play in young children is a response to their desires that cannot be realized; children start with creating imaginary situations where they can be free from perceptual realities that limit their behaviors. By playing in an imaginary situation and being mediated by rules in play, children can go beyond their daily behaviors, and they can develop abstract understandings of behaviors and develop self-regulation of their behaviors.

2.2. Elements of computer games that are attractive to people

Games, which can be considered organized play, have been part of people’s lives since ancient times. However, what accounts for “games” is not totally clear. [Wittgenstein \(1953\)](#) argued that there is no single feature that is common to all games. Among various definitions and conceptualizations of games that have appeared in previous research, I adopt [Hays’s \(2005\)](#) definition of *game*—“an artificially constructed, competitive activity with a specific goal, a set of rules and constraints that is located in a specific context” (p. 15)—due to its comprehensiveness.

According to [Prensky \(2001\)](#), games attract players because they are “a form of fun and play” (p. 118), and they also have the following basic structural elements (p. 119–24):

- **Rules:** Having rules is the most fundamental element distinguishing games from free play. Rules give players certain limits and directions, ensuring fairness as well as excitement.
- **Goals and objectives:** Clear goals and objectives are a source of motivation because players enjoy the process of achieving the defined future state.

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