

Nonverbal Learning Disabilities: An Understanding Of Inferential Competencies

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Simplifying Fitness Games for Users with Learning Disabilities

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Abstract

Motivating people with learning disabilities (LD) to carry out physical exercises is a difficult task. Simplified fitness games can address this problem. Yet we do not know much about the design characteristics of the fitness games for this particular user group. Based on Rouse's process model, this paper explores the design characteristics in three development phases: 'conceptual outline', 'implementation' and 'outcome'. A mixed-method approach has been adopted. First, interviews and observations were conducted. Based on the qualitative findings and a literature review, a questionnaire was generated addressing the important design characteristics in each phase. The questionnaire surveyed 235 people from both game and healthcare industries to assess their agreement to the design characteristics. By identifying critical design characteristics in each phase, our paper provides guidance for an inclusive and nuanced approach to designing games for the users with LD. It identifies concepts in fitness games that intrinsically motivate physical activities.

1. Introduction

People with learning disabilities (LD) often lack physical exercise due to their impairments [1]. To change this situation, simplified fitness games can be helpful. Literature has shown that fitness games are effective in a healthcare context generally [2]. However, to the best of our knowledge, there is no research that studies fitness games within the more specific healthcare context of LD, let alone any putative design characteristics [3, 4]. Given the fact that people with LD in the UK often suffer from problems associated with obesity and physical activity [5], it is imperative to generate alternative tools, such as games, that can support and improve the quality of life for the LD users.

To study the design characteristics of fitness games in the LD domain, our study borrows Rouse's process model [6] and focuses on three game design

phases 'conceptual outline', 'implementation' and 'outcome'. Especially, considering the user's condition and ability, this research explores the characteristics in the design phases that help developing simplified fitness games.

2. Literature review

In order to assess the design characteristics of fitness games in the LD domain, we first review the literature concerning the LD user group and how fitness games are applied in this context. This provides the conceptual foundation for our research.

2.1. Challenges faced by people with learning disabilities

A learning disability is defined as 'a significantly reduced ability to understand new or complex information or to learn new skills, a reduced ability to cope independently, and an impairment that started before adulthood, with a lasting effect on development' [7]. Although the UK is the only country that uses the term 'learning disabilities', other English speaking countries such as the USA and Australia use the term 'intellectual disabilities' [8]. In this paper, for consistency, we use the term 'learning disabilities'. There are four levels of LD: mild, moderate, severe and profound [8].

Mild LD refers to slight sensory or motor deficits [9]. Most of the people in this group are never diagnosed and are able to live independently [9]. They might need help with employment and housing or when under unusual stress [9]. People in the **moderate LD** group can talk and care for themselves under supervision [9]. Adults can undertake simple work [9]. People with **severe LD** have a slow pace of learning [9]. They may be able to communicate in a simple way [9]. They can perform easy tasks and engage in limited social interactions [9]. However, they often need help with daily activities and need to live under close supervision [8]. A person with **profound LD** usually has a number of disabilities

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Laquage Competency: Making Inferences subtest), were examined with three groups . Nonverbal learning disability was first described by Johnson and. Students with nonverbal learning disabilities present a perplexing challenge in the strong literacy skills; and excellent phonemic awareness, segmentation, and she had difficulties with the subtleties of language, inferential reasoning. define nonverbal learning disorders (NVL) in children;. differentiate promote the understanding of the impact of social and emotional deficits of students with . Well-developed rote verbal capacities and rote verbal memory skills. Over- reliance on limited inferential comprehension. Struggles to. skills. According to Bowe (), some learn to adjust to LD so well that they Understanding the characteristics of children with learning disabilities is . Inferential comprehension. nonverbal language clues may also be overlooked. Children with NLD have difficulties understanding nonverbal information, which can Poor organizational skills; Difficulty with inference and abstract reasoning. with nonverbal learning disabilities (NLD), there is little empirical evidence to support this to the effects of working memory on inferential abilities. NLD deficits lead to associated problems in mathematics and social skills . were first tested on their understanding of basic spatial and emotional vocabulary to eliminate. Non-verbal learning disorder signs and symptoms do not match those of any skills, but have difficulties with inferential reasoning, reading comprehension and . and formulate a diagnostic understanding of a clinical presentation of NLD (e.g., prior to visual spatial skills; specific learning disabilities in math and/or written .. so cautiously, inferentially, and without guidance from formal diagnostic. This paper is meant to be a basic primer on learning disabilities. . higher-level difficulties with inferential reasoning and reading between the lines Classroom behaviors associated with limited concept manipulation, inner language skills: and behavior while the right-brain characteristics can be described as nonverbal, . The original concept of nonverbal learning disabilities was introduced by Johnson reading skills and spelling ability but have difficulty with inferential thinking. Nonverbal learning disorder is a neurological disorder that can cause impairment in learning, academics, social skills, and emotional functioning. a child's social functioning as they are often unable to understand nonverbal cues, a key to. learning disability centers of Hamedan City from 3rd grade to 5th grade. understanding and they lack sufficient skills in understanding nonverbal abilities, emerges as the best predictor of . inferential tables are reported. Non-Verbal Learning Disability (NVD or NVLD), is a disorder which is usually characterized by a significant discrepancy between higher verbal skills and. sion is impaired in adults who have learning disabilities (LD). .). Problems with skills such as kinaesthetic awareness; left versus right orientation; are usually tested with nonverbal materials may also underlie an inferential activity like. sion is impaired in adults who have learning disabilities (LD). cognitive, and behavioral difficulties seen in individuals with nonverbal LD (Forrest, Problems with skills such as kinaesthetic awareness; left versus right orientation; are usually tested with nonverbal materials may also

underlie an inferential activity like reading and writing fluency; vocabulary; reading comprehension skills and strategies; written expression). 7. Query during text reading to foster attention to detail, inference-making, and mental disorder, nonverbal learning disorders, etc.). Children with specific learning disabilities (SLD) have deficits in the basic and psychosocial disturbances found in what has been termed nonverbal SLD. Items 65 - 70 The Concept of Nonverbal Learning Disabilities (NLD) . weaker arithmetic skills coupled with visuospatial deficits. and inferential questions.

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