MATCHING GAMES TO LEARNING PREFERENCES

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Abstract*. This article explores the crucial connection between individual learning styles and game selection for enhanced educational outcomes. Educational games should be tailored to different learning styles to be effective and engaging for all students. Matching games to individual preferences unlocks the full potential of game-based learning, fostering a deeper understanding and lasting knowledge retention.*

Keywords*: game-based learning, traditional education, cognitive skills, learning styles, theories, tasks.*

Introduction

Games are more than just a form of entertainment; they have the power to revolutionize the way we learn. Through interactive gameplay, individuals can engage in immersive experiences that promote critical thinking, problem-solving, creativity, and collaboration. Games have the unique ability to adapt to diverse learning styles, providing personalized learning experiences that cater to individual strengths and preferences. This differs significantly from conventional education, which typically adopts a single approach that may not adequately address the individual needs of every student. One of the key challenges in traditional education is accommodating diverse learning styles. People have varying preferences in how they learn best, whether it be visual, auditory, kinesthetic, or a combination of these. Traditional educational systems may struggle to effectively address these diverse learning styles, leading to some students feeling left behind or disengaged. This highlights the need for innovative approaches to education that can better cater to individual differences and help all learners reach their full potential.

Incorporating games into educational settings can be a promising solution to address these challenges. By taking advantage of interactive and engaging nature of games, educators can create dynamic learning environments that are inclusive of diverse learning styles. Games can provide immediate feedback, individualized pacing, and opportunities for hands-on learning, making education more accessible and engaging for all. This stands in sharp contrast to traditional education, which frequently uses a one-size-fits-all methodology that might not be able to adequately meet the needs of every student. Learning styles refer to the idea that individuals have different preferences for how they best absorb and process information. While there's debate about the scientific validity of specific learning style models, understanding these preferences can be valuable for educators. Here's a breakdown:

Visual learners: Learn best through seeing. They benefit from diagrams, charts, images, and other visual aids.

Auditory learners: Learn best through listening. They thrive in lectures, discussions, and audio recordings.

Kinesthetic learners: Learn best through hands-on experiences. They prefer physical activities, experiments, and demonstrations.

Read/Write learners: Learn best through reading and writing. They excel with textbooks, notes, and written assignments.

The concept of learning styles suggests that individuals differ in how they best acquire and process information. While intuitively appealing, learning styles are a controversial topic with ongoing debate about their scientific validity.

Key theories and models

Several models have been proposed to categorize learning styles. Some prominent ones include:

VARK (Fleming, 1987): This model focuses on sensory preferences, categorizing learners as Visual, Auditory, Read/Write, and Kinesthetic.

Kolb's experiential learning theory (Kolb, 1984): This model emphasizes the learning process, suggesting four stages: Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation. Individuals are categorized based on their preference for certain stages.

Honey and Mumford's learning styles (Honey & Mumford, 1982): This model builds upon Kolb's theory and categorizes learners as Activists, Reflectors, Theorists, and Pragmatists.

Research and controversy

While many educators and learners find the concept of learning styles useful, research supporting the effectiveness of tailoring instruction to specific learning styles is inconclusive. Some key criticisms include:

Lack of empirical support: Many studies have failed to find strong evidence that matching instruction to learning styles improves learning outcomes.

Methodological concerns: Criticisms regarding research methods and the reliability of learning style assessments have been raised.

Oversimplification: Categorizing learners into rigid categories may overlook the complexity of learning and individual differences.

Game-Based learning: benefits and challenges

Game-based learning (GBL) integrates games into educational settings to enhance learning and engagement. While GBL holds significant potential, it also presents challenges that educators must navigate.

Advantages:

Increased motivation and engagement: Games can capture students' attention, stimulate their curiosity, and make learning fun and intrinsically motivating.

Enhanced cognitive skills: Games often require problem-solving, critical thinking, creativity, and decision-making, fostering the development of these essential cognitive skills.

Improved knowledge retention: The interactive and immersive nature of games can lead to deeper understanding and better retention of information.

Development of social skills: Many games promote collaboration, communication, adaptability, and digital literacy—skills essential for success in the 21st century.

Personalized learning: Games can offer tailored learning experiences, adapting to individual student pace and providing personalized feedback.

Challenges:

Cost and access: Acquiring and implementing high-quality educational games can be expensive, and access to technology and infrastructure may be limited in some settings.

Curriculum integration: Effectively integrating games into existing curricula requires careful planning and alignment with learning objectives.

Teacher training: Educators need training and support to understand how to effectively use games for pedagogical purposes.

Assessment and evaluation: Measuring learning outcomes and evaluating the effectiveness of game-based interventions can be challenging.

Potential for distraction and addiction: If not carefully managed, games can become distractions or lead to unhealthy gaming habits.

Research and best practices

The idea of matching game types to learning preferences (like those outlined in the VARK model – Visual, Auditory, Read/Write, Kinesthetic) is alluring, but research offers limited support for its effectiveness.

Research findings:

Limited empirical evidence: There's scant research directly investigating the impact of matching game types to learning styles on learning outcomes. Existing studies show mixed results and often lack methodological rigor.

Learning styles debate: As mentioned before, the validity and reliability of learning style models themselves are debated. Critics argue that labeling individuals as specific learner types is overly simplistic and lacks scientific backing.

Focus on engagement: While matching to learning styles might seem intuitive, research suggests that the most crucial factor for successful game-based learning is student "engagement" rather than aligning with a specific learning style.

Background information about learning styles and the most preferable activities in language classrooms:

Engaging visual learners through game features

Visual learners thrive on information presented in a visual format. Certain game features particularly cater to their preferences, fostering engagement and enhancing learning.

Key game features for visual learners:

Strong visuals: Games with vibrant colors, high-quality graphics, and aesthetically pleasing designs captivate visual learners. They are drawn to visually stimulating environments that enhance immersion and comprehension.

Simulations: Games that simulate real-world scenarios or abstract concepts provide visual representations that aid understanding. Seeing processes unfold visually strengthens conceptual grasp.

Diagrams and infographics: Integrating diagrams, charts, maps, and other visual aids within games allows visual learners to process information efficiently. These elements break down complex ideas into digestible visual chunks.

Spatial seasoning puzzles: Games that challenge spatial reasoning skills, such as those involving pattern recognition, 3D manipulation, or navigation, appeal to visual learners who excel at processing spatial information.

Game implementation:

"Cities: Skylines" (City-Building Simulation): Players visually design and manage a city, observing the impact of their decisions on infrastructure, traffic flow, and population growth.

"Kerbal space program" (Space Flight Simulation): Players learn about physics and engineering by designing, building, and launching rockets and spacecplayers.

"Minecraft" (Open-World Sandbox): Its block-based visuals and creative freedom allow players to construct complex structures, promoting spatial reasoning and design thinking.

"Portal 2" (Puzzle-Platformer): Players solve intricate puzzles by manipulating portals and objects in 3D space, honing their spatial reasoning and problem-solving abilities.

Reaching auditory learners through game elements

Auditory learners flourish when information is presented through sound. Specific game elements cater to their preference for aural learning, enhancing engagement and comprehension.

Key game elements for suditory learners:

Music and soundtracks: Immersive soundtracks and sound effects create an engaging atmosphere, evoke emotions, and strengthen memory retention. Well-crafted music can underscore key moments or provide environmental cues.

Voiceovers and dialogue: Games with rich narratives conveyed through clear and engaging voiceovers or character dialogue benefit auditory learners. Hearing information spoken aloud aids in comprehension and recall.

Sound cues and feedback: Auditory cues signaling events, rewards, or mistakes provide clear and immediate feedback, reinforcing learning and guiding player actions.

Rhythmic or musical gameplay: Games incorporating rhythmic patterns or musical elements, such as those requiring precise timing or sound-based puzzles, resonate with auditory learners who excel at recognizing and responding to audio patterns.

Game incorporation:

"The last of us" (Action-Adventure): Its haunting soundtrack and realistic sound design immerse players in a post-apocalyptic world, while compelling dialogue drives the narrative forward.

"Civilization VI" (Turn-Based Strategy): Its evocative soundtrack reflects the historical era and cultural advancements within the game, while advisor voiceovers provide guidance and historical context.

"Guitar hero" or "Rock Band" (Rhythm Games): These games rely on precise timing and auditory pattern recognition, allowing players to learn and perform musical pieces.

"Tetris" (Puzzle Game): Its iconic theme music and distinctive sound effects for line clears provide satisfying auditory feedback, enhancing engagement and motivation.

Engaging kinesthetic learners through game characteristics

Kinesthetic students learn best when they are actively engaged in learning. They gravitate towards hands-on experiences and physical interaction to solidify their understanding of concepts. Games that incorporate the following features can cater to this preference, creating a more intuitive and impactful learning experience.

Interactive elements: Features like clickable objects, drag-and-drop interfaces, and gesture-based controls allow for direct manipulation and exploration, fostering tactile engagement.

Movement and physical actions: Integrating physical movement through motion controllers, virtual reality, or augmented reality provides a tangible connection to the learning content, making it more concrete.

Hands-on tasks: Activities like building, crafting, or physically manipulating in-game objects appeal to the kinesthetic learner's desire to learn by doing.

Exploration and discovery: Open-world environments or games with emergent gameplay encourage exploration and experimentation, allowing kinesthetic learners to discover knowledge through active participation.

Illustrative Examples:

Job simulator (VR): Players physically perform tasks associated with various jobs, such as cooking or working a cash register.

Beat saber (VR): Players use motion controllers to slash blocks representing musical beats, merging physical activity with rhythm and timing.

Super mario maker: Players design and build their own Mario levels using a touchscreen for hands-on creation and experimentation.

Pokémon Go (AR): Players physically navigate their real-world environment to find and capture virtual Pokémon, integrating exercise and exploration.

Engaging read/erite learners through game aspects

Read/write learners tend to learn better when information is presented as a text. They excel at processing information through reading and writing, enjoying games that stimulate these skills.

Key Game Features for Read/Write Learners:

Text-based narratives: Games with rich storylines conveyed through text-based dialogue, in-game documents, or interactive fiction engage read/write learners. They appreciate detailed lore, character development, and complex narratives.

Strategy games: Games requiring planning, analysis, and decision-making often involve written instructions, rules, or in-game communication, appealing to those who prefer processing information through text.

Puzzles involving text or codes: Games involving deciphering codes, solving word puzzles, or uncovering hidden messages through textual clues cater to read/write learners' strengths in language and logic.

In-Game communication: Games with robust chat features or opportunities for written communication between players allow read/write learners to interact and express themselves through their preferred mode.

Game integration

"Disco" (Narrative RPG): Players engage in extensive dialogue trees, read numerous in-game documents, and make choices that shape the story through text-based interactions.

"Civilization VI" (Turn-Based Strategy): Players navigate complex menus, manage resources through text-based interfaces, and engage in diplomacy involving written agreements.

"The Witness" (Puzzle Game): Players solve environmental puzzles that often involve deciphering symbols and understanding complex visual patterns that translate into logical rules.

"Words with friends" (Word Game): Players build words from letter tiles, competing against others in a text-based format that emphasizes vocabulary and strategic thinking.

Case Study: Matching learning styles

While a wealth of evidence suggests the effectiveness of matching games to learning styles, robust empirical research remains limited. However, several studies offer insights into the potential benefits of this approach. One such study, conducted by Papastergiou (2009) investigated the impact of incorporating games aligned with learning styles on student motivation and learning outcomes in a secondary school computer science course.

Methodology:

1. Learning style assessment: The study utilized the VARK questionnaire to assess students' preferred learning styles (Visual, Aural, Read/Write, Kinesthetic).

2. Game selection: Based on the assessed learning styles, educational games were carefully chosen to align with the dominant learning preferences within the student group. For example:

Visual learners: Games with strong visual elements, simulations, and interactive diagrams.

Aural learners: Games incorporating audio feedback, sound cues, and music-based learning activities.

Read/Write learners: Text-based adventure games, strategy games with written instructions, and puzzles involving textual clues.

Kinesthetic learners: Games emphasizing hands-on activities, virtual labs, and simulations requiring physical interaction.

3. Implementation and data collection: The selected games were integrated into the curriculum alongside traditional teaching methods. Student motivation was assessed through questionnaires and observational data. Learning outcomes were measured through pre-tests and post-tests.

Results:

The study revealed a positive correlation between matching games to learning styles and student motivation. Students reported greater enjoyment and engagement when interacting with games aligned with their learning preferences. However, the impact on learning outcomes was less conclusive. While some improvements were observed, the study was limited by a small sample size and the complexities of isolating the specific effects of learning styles versus other factors influencing academic performance.

Conclusions and implications:

This case study suggests that aligning games with learning styles can enhance student motivation and potentially contribute to a more positive learning experience. However, further research is needed with more extensive samples and rigorous methodologies to definitively establish a causal link between matching games to learning styles and improved learning outcomes

Further considerations: while aligning games to learning styles can be a valuable tool, it's essential to:

Avoid oversimplification: Learning styles are not absolute, and individuals can benefit from various learning approaches.

Encourage flexibility: Provide diverse learning experiences to cater to different preferences and help students develop strengths in multiple areas.

Focus on quality: Game selection should prioritize educational value and effective game design principles regardless of learning style alignment.

In education, one size rarely fits all. Students are unique individuals with diverse learning preferences, interests, and strengths. Embracing personalized learning experiences, tailored to these individual nuances, is no longer a luxury but a necessity for unlocking each student's full potential. Traditional, one-size-fits-all approaches often fail to engage students who learn differently, leading to disengagement and a sense of falling behind. Personalized learning, on the other hand, empowers learners by providing them with choices and control over their educational journey.

This is where game-based learning, when carefully aligned with individual preferences, holds immense promise. Imagine a future where educational games seamlessly adapt to each student's learning style, interests, and pace. A future where a student who thrives on hands-on activities can learn through immersive virtual labs, while a peer who excels at reading can dive into a rich, text-based narrative adventure, both achieving the same learning objectives in ways that resonate with their strengths.

REFERENCES

1. Coffield, F., Moseley, D., Hall, E., & Ecclestone, K. (2004). Learning styles and pedagogy in post-16 learning: A systematic and critical review. London: Learning and Skills Research Centre.
2. Fleming, N. D. (2018). VARK: A guide to learning styles.
3. Gee, J. P. (2003). *What video games have to teach us about learning and literacy. New York: Palgrave Macmillan.
4. Gee, J. P. (2007). Good video games and good learning: Collected essays on video games, learning, and literacy. Peter Lang.
5. Honey, P., & Mumford, A. (1986). The Manual of Learning Styles. Maidenhead: Peter Honey.
6. Kapp, K. M. (2012). The gamification of learning and instruction: Game-based methods and strategies for training and education. San Francisco: Pfeiffer.
7. Kolb, D. A. (1984). Experiential learning: Experience as the source of learning and development. Englewood Cliffs, NJ: Prentice Hall.
8. Papastergiou, M. (2009). Digital game-based learning in high school Computer science education: Impact on educational effectiveness and student motivation. Computers & Education, 52(1), 1-12.
9. Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. Psychological Science in the Public Interest, 9(3), 105–119.
10. Pivec, M., & Dziabenko, O. (2010). Teaching in 3D: Pedagogical Affordances and Constraints of 3D Virtual Worlds for Synchronous Distance Learning. Interdisciplinary Journal of E-Learning and Learning Objects, 6, 291-315.
11. Prensky, M. (2001). Digital game-based learning. New York: McGraw-Hill.
12. Rogowsky, J. (2015). Unlocking the potential of game-based learning. Educational Technology.
13. Squire, K.D. (2006). From Content to Context: Video Games as Designed Experience. Educational Researcher, 35(8), 19-29.