Memahami Konsep Computational Design Thinking Melalui Video Game (Studi Kasus: Minecraft) = Understanding the Concept of Computational Design Thinking Through Video Games (Case Study: Minecraft)

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Abstrak

Proses desain arsitektural menghadapi tantangan yang semakin kompleks di era digital— menuntut pendekatan inovatif seperti Computational Design Thinking (CDT) untuk menyelesaikan masalah multifaset. Namun, adopsi CDT di Indonesia masih terbatas karena kurangnya paparan awal terhadap konsep Computational Thinking (CT). Penulis tertarik untuk menelaah relevansinya dengan fakta bahwa anak-anak dan remaja di Indonesia memiliki ketertarikan yang tinggi terhadap video game. Studi ini bertujuan untuk mengkaji bagaimana video game populer, Minecraft, dapat digunakan sebagai platform untuk memperkenalkan dan melatih keterampilan CDT, khususnya bagi individu yang tertarik pada bidang arsitektur. Penelitian ini mengeksplorasi integrasi tiga topik utama: Computational Design Thinking, Architectural Design, dan Video Game, dengan menggunakan Minecraft sebagai studi kasus untuk menganalisis keterkaitannya dari game design dan game play. Dengan pendekatan mixed-methods yang melibatkan studi literatur, pengembangan kerangka berpikir, dan analisis studi kasus, penulisan ini menemukan bahwa Minecraft dapat mensimulasikan prinsip-prinsip CT dan CDT, seperti eksplorasi kreatif, pengembangan kesadaran spasial, pemecahan masalah algoritmik, kerja sama tim, dan kebebasan desain interaktif—tetapi belum secara menyeluruh. Minecraft melibatkan pemain dalam lingkungan virtual dan mensimulasikan tantangan desain dunia nyata, hingga pada akhirnya dapat mendorong inovasi, kreativitas, dan pemahaman yang lebih mendalam untuk nantinya menghadapi perubahan paradigma menuju desain komputasional dan menjadi intelligent designer.

.....The architectural design process faces increasingly complex challenges in the digital era, requiring innovative approaches such as Computational Design Thinking (CDT) to address multifaceted problems. However, the adoption of CDT in Indonesia remains limited due to the lack of early exposure to the concept of Computational Thinking (CT). The author is interested in examining its relevance, particularly considering that children and teenagers in Indonesia demonstrate a high interest in video games. This study aims to investigate how a popular video game, Minecraft, can be used as a platform to introduce and basic understanding of CDT, especially for individuals interested in the field of architecture. The research explores the integration of three main topics: Computational Design Thinking, Architectural Design, and Video Games, using Minecraft as a case study to analyze the connection between game design and gameplay. Through a mixed-methods approach involving literature studies, the development of conceptual frameworks, and case study analysis, this study finds that Minecraft can simulate principles of CT and CDT, such as creative exploration, spatial awareness development, algorithmic problem-solving, teamwork, and interactive design freedom—though not comprehensively. Minecraft engages players in virtual environments and simulates real-world design challenges, ultimately fostering innovation, creativity, and deeper understanding. This prepares players to adapt to paradigm shifts toward computational design and become intelligent designers.