Physics Wonderland

Problem & target audience

To be a good physics learner requires hybrid skills such as 3D spatial imagination, reasoning, mathematical skills. However, achieving these is usually not easy for everyone, especially beginners.Physics Wonderland can help science education beginners gradually grow a physics mindset and build a mapping between physics concepts and their current understanding of the world. Our VR educational game values students' engagement, which is aimed to boost students' learning enthusiasm for physics.

Goal

Physics Wonderland aims to use VR technology to improve students' conceptual understanding of physics learning in a more interactive and immersive way. We incorporate game-based learning in our VR experimental design to enhance students' learning motivation and cultivate their creative thinking skills in physics.

Design Rationale

In our VR educational game, players can build their machines and visualize complex or abstract concepts to solve problems. At each level, players need to learn a specific physics knowledge and use this knowledge to solve pre-designed problems. Students can sense self-fulfillment, belonging, and authority in a virtual reality setting.

Learning Theory

Constructivism (Piaget, 1977)	**Embodied Cognition** (Soylu, et al. 2017)	**Gamification** (James and Wilkerson, 2014)	**Visualization** (Andy, et al.,2008)	**Metacognition** (Flavell, 1976)
The game was designed to be player-centered, and participants will be more independent in exploring and learning with the game's direction, based on constructivism.The information is acquired through the gaming experience of the participants.	The interplay of the mind, body, and environment in describing how knowledge is founded in sensorimotor patterns and experiences is referred to as embodied cognition. It promotes multidimensional learning and accidentally improves students' bodily senses.	Gamified experiences are incorporated into our VR experimental design to boost students' learning motivation and develop their physic innovative thinking abilities. In a virtual reality setting, kids might sense self-fulfillment, belonging, and authority.	We're working on a series of virtual reality games to help students visualize difficult physics ideas. We use visualization to help students develop their attention, memory, and critical thinking abilities.	Our game helps students become more conscious of their own cognitive abilities and create cognition architecture, allowing them to feel more confident in their physics understanding and apply what they've learned in various situations.

Market analysis

With the explosion of the metaverse concept and development of VR technology, the market potential of VR games and education is increasing each year. The global virtual reality in gaming market size was valued at 11.56 billion dollars in 2019 and is expected to grow at a compound annual growth rate of 30.2% from 2020 to 2027 (IDC, 2020). And educators realize that gamified teaching can actually help learners, in both formal and informal scenarios. We believe this gamified experience with VR will incent learners' interests in physical studies, which fuels them in their future self-driven study. And overcome the learning obstacles of physics.

Final Demo

https://www.youtube.com/watch?v=5lBBHHbIR94

Resource

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