K21: The fundamentals, origins, application and potential of contemporary immersive technologies, such as AR (Augmented Reality), VR (Virtual Reality) and XR (Mixed Reality), including psychology aspects of 3D environments, and the uses in the real world (including Internet of Things, Architecture, Construction, Games, Retail, Automotive, Aerospace, Medical etc.)

Overview of Knowledge Gained

During my studies, particularly in Year 5 through the **IMM200 Immersive Media** module, I was introduced to the fundamentals and growing potential of immersive technologies, including Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (XR). This was supported by hands-on exploration of tools such as **Adobe Aero** for AR and **Skybox** for 360° environment creation. I also researched the psychological impact of immersive environments and how they affect user engagement and perception.

Understanding Immersive Technologies

Origins and Fundamentals

I learned that immersive technologies originated from early simulation systems (e.g. flight simulators), evolving into fully interactive, real-time environments made possible by advances in sensors, processing, and display technologies. These experiences aim to blur the boundary between digital and physical worlds.

- **AR** adds digital elements to the physical environment (e.g. using Adobe Aero to place 3D models in real-world space via mobile camera).
- **VR** creates fully virtual environments, typically experienced through a headset.
- **XR** is a broader term that includes both AR and VR, often blending both realities in real-time.

Psychological Aspects of 3D Environments

I explored how immersion and presence, the feeling of "being there", impact user engagement. I learned that factors like spatial design, realism, lighting, and interactivity can affect cognitive load, emotion, and memory retention. These insights are particularly relevant to e-learning, where immersive content can enhance understanding and recall.

Application in Practice

In IMM200, I used **Skybox** to generate immersive 360° visuals and began creating interactive scenes in **Adobe Aero**. These activities helped me understand the workflow of importing, positioning, and scaling 3D assets, as well as how to design environments that feel coherent and accessible.

Outside of coursework, I evaluated how tools like Synthesia could potentially be used within immersive platforms to deliver AI-driven virtual instructors — blending video, AI, and immersive tech. While I haven't yet developed VR experiences with headsets, I gained a strong conceptual and design-level understanding of immersive environments.

Real-World Use and Potential

Immersive technologies are transforming many industries. Through my studies, I learned about:

- **Architecture and Construction** – Using VR to visualise building designs and site walkthroughs before construction.
- **Retail** – Using AR to allow customers to visualise furniture or clothing in their own spaces.
- **Automotive & Aerospace** – VR simulations for training or safety testing.
- **Medical** – AR overlays for surgery or anatomy education.
- **Games and Education** – Creating emotionally engaging experiences that deepen learning.

I found the most exciting opportunity in the use of immersive tools for **e-learning and training**, which aligns directly with my passion for improving engagement and accessibility in educational design.

Challenges and How I Overcame Them

The biggest challenge was understanding the limitations of browser-based or mobile AR platforms versus full-scale VR development. I initially found it difficult to optimise 3D assets for mobile use or understand interaction triggers. I overcame this by exploring tutorials, experimenting with smaller test projects, and using peer feedback to refine my scenes.

Evidence by Academic Year

Year	Focus Areas	Tools Explored	Key Projects
Year 5	Immersive media fundamentals, 360° and AR design	Adobe Aero, Skybox, Spline	IMM200 – Immersive Media
Year	Conceptual application of immersive	Synthesia, interactive	CRP300 – Critical

Year	Focus Areas	Tools Explored	Key Projects
6	tech in learning design	prototypes	Research Project