

Learning in Digital Reality

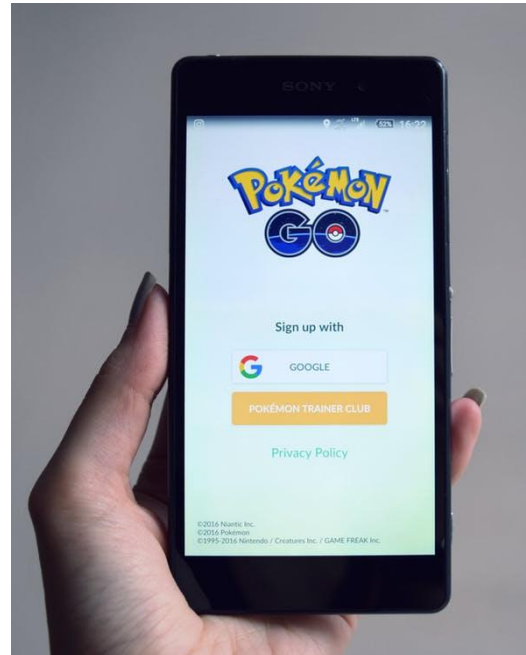
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VR, AR & MR

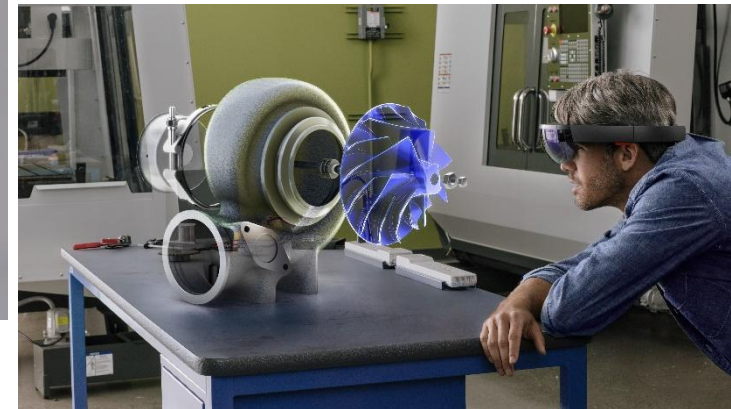
Virtual Reality



Augmented Reality



Mixed Reality



Why use these technologies?

What can we do?

But more importantly...

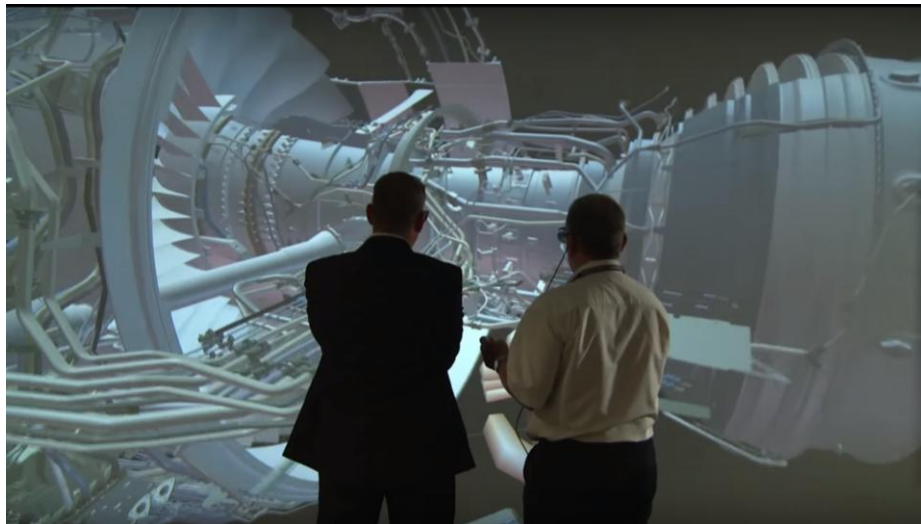
Why should we do it?

Industrial Benefits of VR Usage

Source: http://images.connect2communities.com/pdf/2293_bae_cs_en_may_22_2007.pdf

Case study - BAE Systems Submarine Solutions utilised PTC®-Virtualis virtual reality. They found multiple benefits including:

- the elimination of time, effort and money spent on physical prototypes;
- an increase in design/build productivity;
- real-time access to virtual models and related engineering data;
- significantly faster upload time of 3D models for BAE engineers;
- elimination of time spent by users visiting design departments;
- full access to the VR solution by non-CAD/IT users



AR & VR Project Objectives

Evaluate and **demonstrate** potential beneficial or negative impact of Augmented/ Virtual Reality on:

- Teaching areas of the Applied Engineering Programme (AEP) curriculum
- Student engagement and commitment in courses
- Pedagogic outcomes – knowledge, awareness and skills transfer

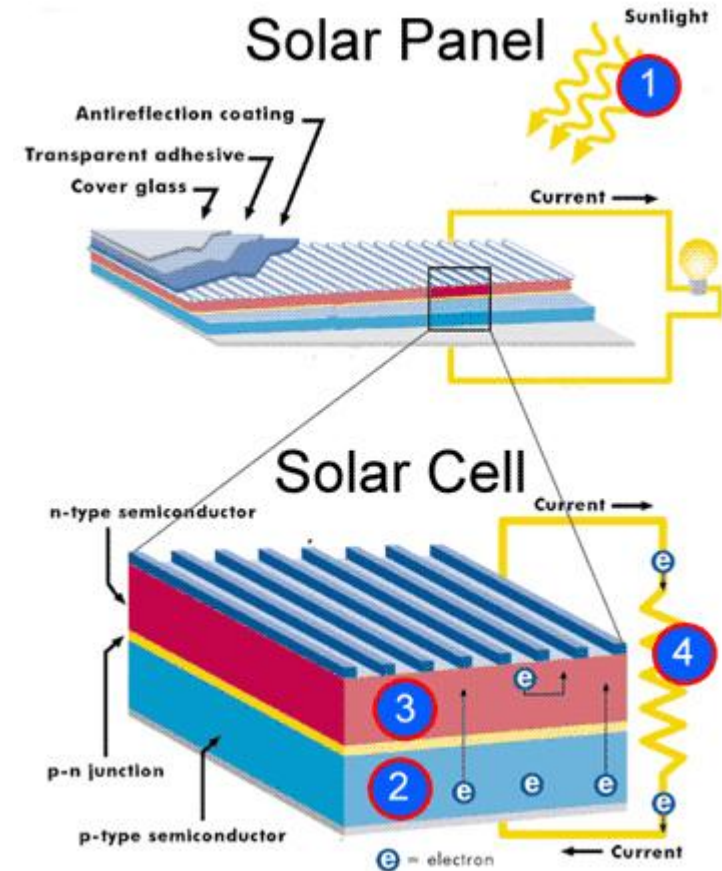
We applied these objectives by creating course content in VR and MR, and seeing what the students thought of it.

Demo



Solar Panel Simulation

A solar panel simulation was created in both VR and MR.



Pilot Study

The solar panel simulations in VR and MR were compared with a traditional learning method, textbook. The same information was provided in each.

Standardised questionnaires were used to collect data on a number of measures, including mood, motivation, engagement, simulator sickness and user acceptance. Participants were given tests before and after being given the learning materials to measure learning.

Preliminary Results

Preliminary results are encouraging, but due to a small sample size cannot be reported until further data is collected.

Pilot data suggests an increase in mood, motivation and engagement for both VR and MR, compared to the textbook condition.

Looking Forward

- Future research:
 - Larger sample size
 - Changes based on pilot feedback
 - Longitudinal study
- Further course content created for modules
- Collaboration

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Thank You