During the last decade, improvements in technology have enabled teachers to transform knowledge in ways that were never previously possible. Ongoing developments in information technology and engineering have led to an increasing demand for 3D projections and holographic displays. Indeed, a broad range of fairly mature 3D equipment is already on the market.

The available systems, however, suffer from the drawback that users have to wear special devices to separate the images resolved on the left and right eye. Such “aided viewing” systems have been firmly established in many professional applications. Further expansion to the educational sector will require “free viewing” systems with improved viewing comfort and most importantly be of an affordable price. Furthermore, the 3D models are usually generic, rather than specific to the individual structure of origin, and are therefore not a true reconstruction of reality.

In this proposed research, we want to demonstrate and rigorously analyse 3D holographic displays and propose semi-holographic projections as tools to enhance learning with perceived educational benefits, projecting real-world 3D models for visual analysis and inspection.

Research Objectives
The objective of this research is to put forward innovative ways in which holographic technologies can be applied in education with reasonable cost and provide a more realistic reconstructed reality. This research intends to promote further research and development in the field of cost effective real time holography in education. More specifically, this project has the following objectives:

– Research the limitations of existing 3D projections and possible solutions.
– Research the technical requirements needed to configure a 3D semi-holographic display with realistic size.
– Develop and construct a semi-holographic projection prototype with reasonable cost.
– Research educational applications of our proposed technology.
– Research and develop custom 3D software for realistic reconstructions (structure-specific over generic).
– Research the mapping of 3D models to our proposed holographic projections.
– Utilize AR gloves for the control of such systems.