

# Haptic Prototype Assembly Tool for Non-Sighted, Visually Impaired and Fully Sighted Design Students, Studying at a Distance.

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Designers use a blend of analog and virtual processes to produce a design prototype solution. The rise of virtual and haptic prototyping tools indicate a potential for the use of haptics for creative human computer interaction (HCI). Thereby allowing designers to feel more 'hands-on' with the virtual modelling processes. This paper presents an investigation of an inclusive educational haptic tool and interface. Using a Geomagic Touch™, a haptic interface was designed to facilitate the initial design process for non-sighted - visually impaired (NS-VI) and fully sighted (FS) distant learners. The student participants involved in this study were all registered to design modules at The Open University (OU). This paper initially analyses the viability of the tool via a formative and qualitative testing with design academics. This was followed by a main study examining manual prototyping (MP) and virtual haptic prototyping (VHP) results. This paper analyses the results of 'time' taken to assemble a four block prototype, and the number of collisions (*error*) between block shapes during assembly. Time was recorded as time in both modes was taken as assembly time of the complete prototype. A between groups analysis was examined. Results showed that although the MP was completed at a faster time than VHP it was only *approx. (+/-) 60secs* difference. It was also shown that NS-VI participants produced similar average time in the VHP mode to their fully (FS) sighted peers, with only a slight difference in collision errors.