



## **HAE V-Hire 16-05**

### **Background**

The Tool Hire & Equipment and Event Sectors face many challenges going forward but the Hire Association Europe (HAE) is leading efforts to support members and their businesses. In order to improve sector productivity, health and safety and product awareness, HAE decided to invest in new technologies and make access to training more readily available and to a wider audience. To do this they decided to utilise innovative solutions and to examine / review 360 degree video, 3D animation, Virtual and Augmented Reality and Oculus Rift. HAE worked closely with the Construction Industry Training Board (CITB) and commenced a programme to develop this new approach. CITB's support and guidance was essential in making this project a reality.

### **Initial Approach**

The initial approach chosen to utilise technology and widen access included online, mobile, using Virtual Reality and the original plan was to cover all of the construction industries key areas including Occupational Health and Health and Safety as well as product specific (tools and machinery) training. A working group was established to determine which activities to prioritise. A key objective of the project was to ensure the training was made available to the harder to reach members of the supply chain/construction industry. By embracing technology, training could be delivered cost effectively, utilising VR product awareness training in a safe environment in a location to suit the users.

### **Maximising Learning and Access**

The need to consider different approaches, utilise alternative methods and embrace new technology is paramount for a society to develop. Those people and sectors who recognise the need to embrace change, tend to assist their longer term survival. In order to ensure that this project would deliver the maximum outputs it was agreed that the training should challenge and measure a candidate's retention of knowledge via an end of module test. In addition a candidate's progress should be recorded through the programme. The plan was to develop a database to sit alongside the training & to support users to build up a 'portable portfolio'. In particular the training/assessment would support hirers of kit to improve their knowledge and competence and improve the health and safety of the user.

### **Skills Gaps and Skills Shortages**

In addition to seeking to improve sector productivity, health and safety / product awareness and to address gaps in employee knowledge, the sector is also suffering from a significant shortage of new recruits. HAE has worked closely with CITB over a number of years to develop a Specialist Apprenticeship Programme (now called a Specialist Applied-skills

Programme SAP) to bring in new recruits and also a Level 3 Management & Leadership Programme to develop the existing workforce in higher level roles to fill gaps.

Technology and the expectation from younger people joining sector that they embrace this in their working life as they do in their social / leisure time was also a motivating factor behind introducing this project. The plan was to ensure that through both members and their supply chain and candidates working through any HAE programme would have access to the VR. This aim was to support people becoming more familiar with this type of technology and spread the word about how this method and approach was needed now, not just in the future.

### **Building the Team**

HAE met with a range of potential developers and providers working in the sector who could deliver the chosen method and technology. This included representatives from the University of West of England (Bristol) who design programmes and deliver a BSc(Hons) Games Technology undergraduate degree programme. UWE Bristol have a number of startup businesses that include gaming graduates and placement students. UWE Bristol is also a 'PlayStation First' partner allowing students to gain direct experience of developing for Sony PlayStation using their official development kits. This approach allows their undergrads to gain valuable real-world experience and a professional portfolio through placements such as V-Hire that prepare them for a career in the gaming industry. UWEs graduates work across AAA developers, including Rockstar North, Frontier Developments and Naughty Dog, and local developers such as Opposable Games and Mobile Pie. We felt that working with UWE and their partners it would best support HAE members, their employees and their supply chain customers/partners to access simple, more innovative and more accessible routes to training.

### **Working Group**

The working group was made up of representatives from HAE's Board and HireTrain the CITB supported National Training Group. This included in scope CITB employers from the major multi outlets such as Brandon Hire, A-Plant, HSS, VP HireStation, Speedy Hire, and SMEs such as Skipton Hire Centres and Astley Hire. It was agreed that the best way forward was to work with our chosen technology provider who could make access for members as easy as possible. We would then develop a suite of modules and showcase them at multiple events across Great Britain to engage as many people as possible.

### **Technological Options**

The development in mobile technology gathers at an ever increasing pace. At the start of this journey, the only realistic way to build the modules was via Unity and to develop the platform via Android as Apple via IOS did not offer this route. The choice of hardware was also a key determining factor. The use of VR Gear with mobile phones and Oculus standalone headsets was agreed as the most appropriate route to market for members. We also agreed to develop two modules for a full VR Vive experience utilising a high powered gaming laptop (Digger + Mobile Elevated Working Platform)

## **Selection of Initial Modules**

The original concept that was approved by CITB involved the development of 12 modules. The working group decided that the best way to make this as inclusive as possible was to increase this number and range of modules developed and the target was therefore increased to 20 (plus a Dust Module Video). HAE's Board agreed to underwrite the increased level of investment. However, without the original support from CITB this co-investment would not have been possible. The chosen modules covered a wide list of small plant, tools and equipment and activities across the industry. These were developed on the basis of equipment used by operatives on site such as angle grinders, compacting plates, drills, hoists & ladders etc. In addition this was bolstered by increasing the awareness and safety knowledge that supervisors and managers need to utilise to protect their employees health and safety and wellbeing for example dust, hand arm vibration and electrical safety. The programme also officially gained a new title 'V-Hire'

## **The Development of Virtual Reality (V-Hire)**

V-Hire was therefore developed as a standalone Android application (in both VR and Non VR formats) with 20 custom made training modules ranging from working at height to lighting on site. Storyboards were developed to take users through each module by investigating items that are interactive and display information about the specific topic. Users interact in a simple and accessible way to progress through a module and investigate different scenarios. Once users have navigated through the interactive setting they then take a multiple-choice test that asks questions on content covered within the learning module. Users are graded on the outcome of this test and they are rewarded with a score and a pass or fail depending on this grade. The modules can be retaken as many times as needed without penalties as the idea is to learn the correct approach. By making this available the aim was to improve productivity, make customers safer, reduce risk of injury, or damage to equipment.

Below is a list of the modules developed. These topics cover the vast majority of items that are hired within the industry and also include the main areas of risk that are targeted by the Health and Safety Executive (HSE) such as dust, working at height, hand arm vibration and noise:

- ANG – Angle grinder module
- COS – Cut off saw module
- DDR – Diamond drill module
- DST – Dust video module
- DS2 – Dust module
- EBR – Breakers module
- LPG – Liquefied petroleum gas module
- GEN - Generator
- DRI - Cordless Drill + Battery equipment
- SPP - Submersible Pump
- HOI - Materials Hoist
- LAD - Ladder
- ELE- Electricity module
- HAV – Hand arm vibration module
- LPG – Liquefied petroleum gas module
- PLA – Plate compactor module

RPS - Reciprocating saw module  
WAH - Working at height  
PVR- Poker Vibrator  
ROT - Rotary Hammer  
LIT - Lighting Festoon + Flood

### **V-Hire Roll Out**

HAE has 900 members across the range of plant tool equipment and events providers. It also includes a range of large construction businesses such as BAM, Henry Boot (Banner Plant) and Morrisons (M Group Services). HAE undertook a marketing campaign through our weekly newsletter, quarterly Interface Magazine, social media, via the construction press and actively took out the equipment to as many people as possible to spread the word. One of the overarching aims of V-Hire is to provide an easy entry level system that would also appeal to non traditional VR users and not being too complicated to use. V-Hire was shortlisted for a number of awards and won the Commitment to Skills Award at Plantworx in 2017.

<https://www.hae.org.uk/news/press-release-haes-virtual-reality-training-programmes-wins-prestigious-innovative-award/?modal=std>

### **Example of Marketing Article Linking into the Careers Plan**

In the Winter 2018 Edition of Interface we outlined how HAE EHA is utilising technology and careers to attract people into the sector. A wide range of roles exist in our sector for both young people and those looking to make a career change. However, one of the continuing themes is the need to embrace technology. By developing two parallel training routes that includes short courses and a career path, we offer employers and employees training options. This helps promote the industry be it for longer term or shorter term seasonal roles. Through initiatives such as Future Hirers, we are showcasing the sector and demonstrating how such mediums such as Virtual Reality (VR) play an important part. It is essential that potential recruits see the industry as exciting and could lead to a career rather than just a job. The use of new technologies and embracing training can only benefit this. In the Spring Edition of Interface our General Manager Rupert Douglas-Jones outlined the development of VR 'V-hire'. This will support HAE EHA members to offer their staff and customers the opportunity to undertake safety briefings or refresher training on a piece of equipment.

HAE also produced an initial video for YouTube to showcase the user experience to a wider audience. <https://www.youtube.com/watch?v=SwLBQwJ2ppo>

HAE staff then took VR on the road and below is a selection of exhibitions, events and individual presentations by HAE staff:

- 21/22 September 2016 - Exhibited at Hire Convention, Loughborough
- 19/20 October 2016 - Presented at the Showman's Show, Newbury
- 8/9 February 2017 - On our stand at Executive Hire Show, Coventry

- 6-8 June 2017 - Presentations and live demonstrations at PlantWorx, Bruntingthorpe
- 11/12 October 2017 - Exhibited at HAE EHA Hire Convention, Coventry
- 18/19 October 2017 - On our stand at Showman's Show, Newbury
- 16/17 May - Vertikal Days, Donnington on CW Wilson stand
- 7/8 February 2018 - On our stand and live presentations at Executive Hire Show, Coventry
- 18 July 2018 - On our stand at Safety In Construction Show, Derby
- 11th September 2018 - Image of Construction event in London with CITB
- 2 October 2018 - Exhibited at HAE EHA Hire 2018 Conference, Loughborough
- 1 November 2018 - School Careers Evening Ashby de la Zouch
- 6/7 February 2019 - On our stand at Executive Hire Show, Coventry
- 25 June 2018 - On our stand at Safety In Construction Show, Derby
- 26th June 2019 On our stand at Safety In Construction Show, Derby
- 4th July 2019 Demo Expo Hertfordshire ShowGround

Employer demonstrations:

- 5 November 2017 - Numerous delegates from Lovell plc on their site
- 9th April 2018 - Speedy Hire, Newton-le-Willows
- 10th April 2018 - Spanset, Middlewich
- 11th April 2018 - Saint Gobain, Northampton
- 18th April 2018 - Marlow Marquees, Amersham
- 18th April 2018 - Site Equip, Lasham
- 19th April 2018 - Human Focus, Birmingham
- 20th April 2018 - Garic, Bury
- 1st May 2018 - Access Link Group, Newcastle
- 10th May 2018 - Hirebase Uttoxeter
- 15th May 2018 - Hirestation, Leeds
- 24th May 2018 - Morris Site Machinery Limited, Newcastle under Lyme
- 24th May 2018 - Speedy Hire, Newton-le-Willows
- 8th June 2018 - HSS, Manchester
- 13th June 2018 - Inspire, Nottingham
- 22nd June 2018 - AMRC Research visit and VR review, Sheffield
- 27th June 2018 - A-Plant, Warrington
- 6th July 2018 - Hilti, Manchester
- 26 July 2018 - Live demos to Morgan Sindall workers at one of their construction sites in Portsmouth
- 20th September 2018 - JLG, Middleton
- 26th September 2018 - CEO's Plant Group, Belfast
- 16th October 2019 - Lord Tool Hire, Newcastle
- 5th November - Live demos for Lovell, Birmingham
- 8th November 2018 - Construction Dust Partnership (HSE), Fareham
- 9th November 2018 - Saint Gobain, Sheffield
- 16th November 2018 - HSE Inspector Chris Lucas, Newcastle
- 21st November 2018 - Smiths Equipment, Blackpool

- 27 November 2018 - Phoenix Hire and Sales on their site
- 4th December 2018 - Stallard Kane, Gainsborough
- 12 December 2018 - Numerous delegates from American Rental Alliance at our offices
- 3rd January 2019, HSS Training seminar, Birmingham
- 10 May 2019 - Patrick Bowring of Qualified Contractors Ltd. at our offices
- Speedy Hire
- 7th November 2018 KPH Group
- 4th July 2019 Construction Dust Partnership (HSE and contactors)
- 4th Jan 2019 - VP Brandon HireStation
- 9th January 2019 - Construction Industry Welfare Meeting
- 29th January 2019 - The Preparation Group, Lincoln
- 21st February 2019 - Global Rental Alliance meeting, Anaheim, CA
- 28th February 2019, CITB NI, Belfast
- 8th March 2019 - GAP Hire, Glasgow
- 8th March 2019 - Specialist Construction Academy, Glasgow
- 1st April 2019 - Plato Catering, Alcester
- 2nd April 2019 - Bentley Brown, Guilford
- 2nd April 2019 - Allens Catering, Houslow
- 3rd April 2019 - Reactive Hire Limited, Loughborough
- 3rd April 2019 - Saint-Gobain Abrasive, Cotesbach
- 4th April 2019 - Oxford Event Hire. Oxford
- 2nd May 2019 - AFI Group, Castle Donnington
- 2nd May 2019 - Vp PLC, Harrogate
- 8th May 2019 - Oxford Marquees Ltd, Kidlington
- 15th May 2019 - ASEAMAC conference, Madrid
- 15th May 2019 Hire Train Meeting at A-Plant, Nottingham
- 20th May 2019 - Co-Ordination Catering, Crawley
- 8th June 2019 - HG Plant, Chelmsford
- 8th July 2019 - JCB Digger and Dumper Group, Utoxetter
- 11th July 2019 - PASMA, Glasgow

Due to be exhibited in 2019

- 1 October - Exhibition stand at Hire 2019 Conference, Loughborough
- 1 / 3 October, Careers Event, EPIC Centre Lincoln
- 16/17 October - On our stand at Showman's Show, Newbury
- 7 November 2019 - Careers event John Henry Newman Catholic College, Birmingham
- 14th November 2019 - Access Industry Forum, Manchester

## Selected Images & Photographs From V-Hire & Deployment Events

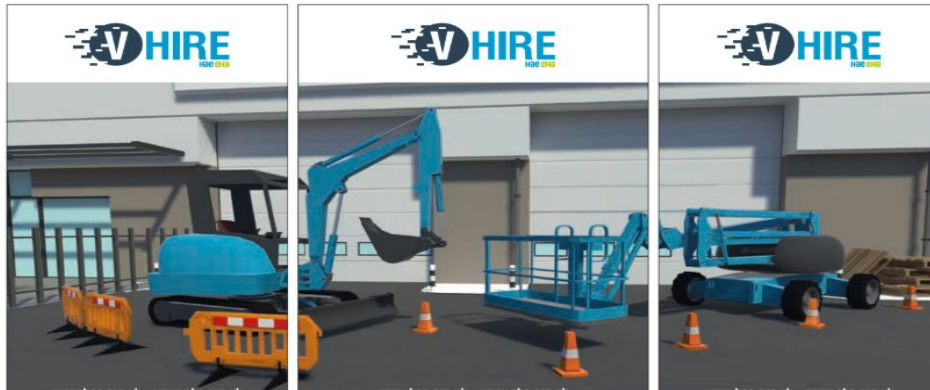


Image of Construction Event 11th September 2018, London





**HAE EHA Conference 2nd October 2018, Loughborough University**



**Careers Event in Ashby de la Zouch 1st November 2018**





**Lovell Event Birmingham 5th November 2018**



**Safety in Construction Show, 25th June 2018 Derby Arena**



### **Demo Expo with NFDC 4th July 2019, Hertfordshire (Showcasing google Cardboard)**

#### **Feedback and Reception by the Industry**

Over the past 2 years V-Hire has been viewed by thousands of individuals and many hundreds of businesses across the UK. We have even showcased it at the European and Global Rental Alliance meetings. The app is available to download from the App Store via invitation and many members have utilised this directly. The vast majority of those who viewed the programme felt that it would make a difference and support raising awareness, develop a safe working culture and assist organisations training their workforce. Many liked that the main tools they hire out to the supply chain or their workforce utilise such as a breaker or reciprocating saw had a module. Some felt it would allow them to deliver refresher training in-house during downtime and low periods in the depot/workshop activity. One member advised that his son used the equipment and felt the graphics were 'Ok' (compared to his Playstation) but the actual experience of the tools was exactly what he needed on his plant maintenance apprenticeship.

#### **Areas to Consider**

A few users felt that the Android platform did not give them sufficient coverage within their organisations as they operated IOS Apple products and would need to buy new hardware. Some felt that the experiences were too long and would delay transactions when equipment was brought to site or hired from a depot. One member felt that he could not expect a driver to take this kit to site, wait for the hirer to use the VR Gear Headset, prior to handing over a mini digger or vibrating plate to a group of groundworkers. A couple asked if we would develop versions for a tablet or even google cardboard. Out of the hundreds of demonstrations only one person advised V-Hire was too 'clunky' and would not be taken up on site by construction workers as they 'Do not readily adopt new technology'.

## **Developments Following Feedback**

The working group took on board the feedback from users. They agreed length of some of the experiences were too long and it was agreed that shorter modules may be offered for some topics with future builds. The original plan for hardware was based around the use of VR Gear using android mobile phones and the stand alone Oculus headsets (In addition to the two modules developed for the full VR Vive experience). It was agreed that the adoption of a tablet option would allow a greater take up especially with the low cost of the units and the locating of them on hire counters within depots. We also examined the possibility of using google cardboard as a cost effective way to provide every member user with a headset. After gaining support from the Board, we agreed a build with our technology partners for both tablet and google cardboard. The later was showcased the Executive Hire News Show in February and has been very well received. The tablet version was made available from April and again this has been well received with employers and showcased at the Safety in Construction Show in Derby on 25th June and the Demo Expo on 4th July in Hertfordshire. Additional modules were also requested and these are identified in the 'Next Steps' section.

## **Examples of Quotes From V-Hire Users**

1. We demonstrated the V-Hire System at our Compliance Conference in Manchester and the team really liked the interactive nature and range of tool modules on offer. This reflects many of the items in our hire fleet.

Scott Ball  
National Compliance Manager - Workshops  
Vp Brandon Hire Station

2. HAE's Virtual Reality V-Hire is an excellent training and awareness raising tool for the industry and we support its introduction.

Neil Bravery  
Managing Director  
SHC Hire Centres

HAE also produced a more updated video on YouTube to showcase the user experience to a wider audience which can be shared via CITB's website. <https://youtu.be/U8KrZ09-m6Y>

## **Summary**

When HAE commenced on this journey under the guidance of our MD Graham Arundell, the vision was clear to move forward in order to improve sector productivity, health and safety and product awareness through embracing new technology. We believe that this has been achieved. We have learned a number of things during the process, not least the number of people you need to consult and check in with as you develop ideas and solutions. This learning has been captured and will be utilised to help the sector and wider industry. CITB's support for the sector has allowed the association and its members to embrace new

technologies that will benefit their organisations, their customers, the wider supply chain and the construction industry.

### **Next Steps**

HAE were successful in gaining project support as part of CITB's Immersive Learning Commission in early 2019. Hire Association Europe is the lead partner, working with the Drilling and Sawing Association and the National Federation of Demolition Contractors. The main aims of the project are to examine:

1. How do we make training **more accessible and personalise the experience**
2. How do we support learning in a **safe environment anytime across GB**
3. How do we integrate this into lifelong learning and a **career path**
4. How do we **encourage people to join sector** who expect to use technology

We have used the lessons learned from Project HAE 16-05 to feed into what we now call Project pHAETon. For example the new build will be operable on both Android and IOS and offer more hardware options. This will widen the offer to many more organisations and individuals and support CITB's aims to determine if technology can drive training in the industry. The new project involves the 3 trade bodies integrating 5 different experiences that explore the use of VR technology in aiding with e-learning solutions:

Mental Health Awareness  
Introduction to Plant & Tools  
Environmental Awareness  
Asbestos, Dust, Particulates  
Banksman Traffic Marshalling

Each experience will be tailored to meet all of its learning outcomes and use the Virtual Reality technology to fully immerse the user into a rich digital world. Crucially an editor will be created that will allow non technologists to create modules that will then convert into working VR and mobile learning modules through our platform 'pHAETon'. This will address many of the points raised, such as the length of experience, the images, and be deployed across multiple hardware units and via Android and IOS Apple operating systems.

PD Gaze  
Commercial Manager  
12th July 2019