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Education
& Training
Foundation**



LEARNING FUTURES PROGRAMME FINAL REPORT



VIDEO LEARNING FOR ENGINEERING APPRENTICES

PETA Limited

PARTNER ORGANISATIONS

Ideas4Learning Limited



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Project title

Video Learning for Engineering Apprentices

Name of lead organisation

PETA Limited

Project summary

Our vision was to develop video learning ‘hotspots’ within engineering workshops for apprentices, to encourage independent learning and reduce waiting time for support. Within a workshop area, an Instructor works with 10-16 apprentices, each operating a piece of machinery which naturally creates delays in accessing individual support.

The team recognised that waiting time could be reduced or utilised more effectively through easy access, point and play learning opportunities. Apprentices wait for support for a variety of reasons, including:

- a lack of confidence in taking, or they’ve forgotten, the next step;
- they’re unable to identify the tool or equipment needed;
- they’re struggling to perform maths calculations;
- technical problems with the equipment/machinery.

The aim of our project was to create learning hotspots of the equipment itself or pictures on the wall providing – step-by-step how to video. These would take the apprentices through a process or calculation, information about tools, opportunities to find out more about equipment in industry and self-assessment video quizzes.

The CPD action research project introduced engineering instructors to tablets devices, video editing, mobile learning pedagogies and tools including Quick Response (QR) codes and augmented reality software. As well as exploring ways to make it all work within a noisy and dirty learning environment.

<p>Video Learning with Engineering Apprentices</p> <p>Project Rationale</p>	
	
	
<p>Gavin Smith, Senior Manager, Government Funded Training explains why PETA ran a video learning project.</p>	
<p>Click on the image or follow PetaEngineers on Aurasma App, point at the video to watch.</p>	

Who should read this report and why

This report will interest those who:

- want to develop their own mobile technology skills or those of their staff;
- want to promote greater access to independent learning opportunities;
- are seeking ways to provide easy access to learning materials in non-standard classroom environments;
- want to introduce learning technologies into environments where it is not necessarily conducive to do so;
- are planning e-learning CPD programmes for staff delivering apprenticeship programmes;
- are work-based learning providers considering to bid for future learning technology funded projects.

CPD resources developed

Below is a list of resources produced by the project. Further details about the resources can be found in the **Resources section** at the end of the report.

- Session – The YouTube editor;
- How to – Edit engineering videos in YouTube;
- How to – Join video clips in YouTube;
- How to – Create videos from images in YouTube;
- How to – Add closed captions to YouTube videos;
- Session – Creating assessment resources;
- How to – create video quizzes using Blubbr;
- Resource – Nuts quiz;
- Quiz Blubbr – Nuts Quiz;
- Resource – Bearings and gears quiz;
- Quiz Blubbr – Bearings and gears quiz;
- Resource Keys quiz;
- Quiz Blubbr – Keys quiz;
- Resource – Washers quiz;
- Quiz Blubbr – Washers quiz;
- How to – create quizzes using Quizizz;
- Resource – Low voltage electrical equipment quiz;
- Quiz Quizizz – Low voltage electrical equipment quiz;
- Session – Creating QR codes and Augmented Reality resources;
- How to – Create QR codes;
- Resource – Equipment and tools QR codes;
- Resource – Electrical equipment QR code game;
- How to – create Augmented Reality resources;
- Resource – Augmented reality;
- Session – Creating learning modules using Moodle Lesson;
- How to – Use Lesson;

- Video resource – Blocking up;
- Video resource – How to centre a tool;
- Video resource – Setting the tool height on the lathe;
- Video resource – Turning trigonometry;
- Video resource – Voltage indicator;

Project lead contact details

PETA Ltd (formerly known as Portsmouth Engineering Training Association) was founded in 1970 by Alex Zemenides when he was Managing Director of Sealelectro Ltd. Together with five other companies he based the Association in Southsea. The combined vision of this group was to establish an organisation, controlled by local business that would be free from external influences to concentrate on the training and development of people employed, or about to be employed, in industry and commerce.

PETA Ltd is a registered charity, directed by an executive council, elected from the Membership. It operates on a self-financing basis and is non-profit making, with funds reinvested to expand services and training.

The organisation continues to operate as a Group Training Association (GTA) across Hampshire, Dorset and Sussex delivering Engineering, ICT, Business and Management and Team Leading apprenticeships. In addition to the Apprenticeship offer PETA delivers Full Time Study programmes and Traineeships as well as a wide and comprehensive range of corporate courses to support business needs.

With training centres in Cosham, Havant and Portsmouth PETA currently supports approximately 400 apprentices.

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Members of partnership

Ideas4Learning Limited, a learning technologies consultancy. Their core business is the development of technology within teaching and learning and with backgrounds in education provides a strong focus on pedagogy as well as teaching the skills to develop and use both technology and software creatively.

What the project set out to do and why

The project set out to transform how learning takes place in PETA's engineering workshops by introducing mobile technologies and independent learning opportunities. In doing so it aimed to solve a number of challenges:

1. Waiting times for engineering apprentices when taught in the workshop areas - with one instructor supporting 10-16 apprentices operating individual machinery, there was a need to reduce delays in accessing support.
2. Access to technology in workshop areas - the engineering department had no Wi-Fi, no tablet computers and a ban on mobile phones because they distracted apprentices and are therefore a potential health and safety risk;
3. Low digital literacy skills of staff – with no access to and use of technology within workshop space, instructors' mobile and digital technology skills needed to be developed and their confidence increased;
4. Noisy and dirty learning environment – The workshop area is open and when machines are running it is very noisy making it difficult to hear a video on a tablet device. Using tablets in an environment where floors are concrete and the machines are oily does not provide a tablet long life span.



Matt Dunn, Engineering Training Manager explains why hotspots could be the answer to reducing waiting times in the workshop area.

Click on the image or follow PetaEngineers on Aurasma App point at the video to watch.

The process

Our project started when writing the initial tender proposal. We recognised the importance of buy-in across the organisation from the Senior Leadership Team, the Engineering Department and the IT Support Team. By including everyone there was a clear understanding and agreement on time commitments and resource requirements. It also ensured that the bid remained realistic and relevant to the needs of learners, instructors and our company. Inclusion of the IT Support Team bought forward the planned introduction of Wi-Fi to the workshop areas ensuring it would be available if the application was successful.

Before the delivery of the project started a number of documents were created: a project plan, an evaluation plan and work packages for project team members. The work packages detailed the individual's role and responsibilities and each team member was asked to agree they acknowledged the commitment they were making. A shared folder within Google Drive was used as a means to collect project evidence and Google Forms was used by engineering instructors as a means to request support or post reflective comments.

Instructors were selected from a number who volunteered to take part in the project. It was important the Instructors took ownership of the project. They were asked to research and decide what tablet devices they wanted to use, a job normally the responsibility of IT Support. In empowering them to make that decision, it was felt they would be more likely to use the device and find solutions if things didn't work rather than blame the equipment they'd been given.

Three instructors were involved in the project Ian Austin, Andy Clayton and Stephen Legg. They represented training for the machine shop, maintenance and electrical engineering.

IT Support purchased the make and model of tablet requested by the Instructors, a Samsung tablet. The team also made the decision to purchase three different cases for the tablets to investigate their suitability in the workshop environment.

The tablet devices arrived just before the Christmas holidays. The decision was made to distribute them to Instructors prior to any formal training, instead suggesting they took them home over the holidays giving them a chance to explore and familiarise themselves with them if they wished.

The instructors took a baseline digital literacy skills assessment which was then repeated at the end of the project to measure distance travelled.

A Learner Focus Group was held, this was run by Ideas4Learning. The aim to find out what challenges the learners faced within their workshop time and to explore the types of video learning resources they felt they might benefit from.

Four workshops were planned and delivered covering a range of skills including video editing in YouTube, creating video quizzes, QR codes and augmented reality software. Workshops were planned for three hour periods, to provide Instructors with time to practise skills, share outcomes and discuss application. These workshops were attended not only by the three instructors but wherever possible by Gavin Smith, Senior Manager, to ensure

he was fully aware of the skills being taught and to see how they might transfer to provision in other apprenticeship and corporate delivery within the organisation.

Practise time was built into the project, to give instructors the time to try things and build confidence. Alongside this individual support time was allocated to support Instructors after the 4 workshops, enabling them to progress in their chosen direction.

As Instructors completed resources they shared them with their peers for feedback and tried them out with learner groups. As part of the quality review process PETA formed links with two other providers to test the resources.

Each year, in September, PETA Limited has an event specifically to engage with local business. This became an obvious choice in showcasing the project and engaging with engineering companies in order to identify three who would support the final stage of the project, working on the creation of learning videos based on equipment in industry. Making use of events already in PETA's calendar helped to keep project costs down piggybacking of events that had their own budget with other staff organising and administering them.

In a similar way, opportunities were taken by Instructors to disseminate within their own organisation whenever possible - staff meetings, non-project training sessions and to the Members at Board Meetings. The project built in a staff training session for all staff delivering apprenticeships during September.

The original training materials were adapted so that they were enhanced by the feedback from the Instructors who had used them. A section 'In practice' was included to show how skills taught were being used by the Instructors. This section includes resources made by the Instructors either in the practice sessions or as a final resource and clips of them talking about why they selected the different approaches for their apprentices. Within the QR code resources are video clips from apprentices who also produced short learning videos for future apprentices to use.

During the project we recognised that it could be enhanced by learning what was happening in other organisations and so we took up all opportunities offered by both the Learning Futures Team and other organisations during the course of the project. As a result we attended the BETT show, a Teach Meet at a local college, the Learning Futures Sharing Practice events and access to an Industry Mentor.

The results

Challenges overcome

Challenge 1 – Waiting Times

We want to reduce the waiting times for engineering apprentices when taught in the workshop areas - with one instructor supporting 10-16 apprentices operating individual machinery. There was a need to reduce delays in accessing support.

As a result of the project, there are now 'Hot spots' within the engineering workshops on machines, the walls and on tools. As a result apprentices can now access learning and support videos and resources.

Before

No learning hotspots on the walls



Apprentice Focus Group comment

“Our apprenticeship gives as an overall idea on how to set up and use the equipment but the equipment we use at work is very different - it operates differently. We have two CNC machines here but it isn't the same. Don't get me wrong we need to learn what we cover here; it is really useful, it helps us to do our jobs and to spot possible problems or faults when using the machines at work. I think videos showing how the machines we use at work operate would be really useful.”

After

Learning hotspots are now available on the walls via trigger images for augmented reality resources or QR codes.



Before

After

Equipment and tools were simply that.

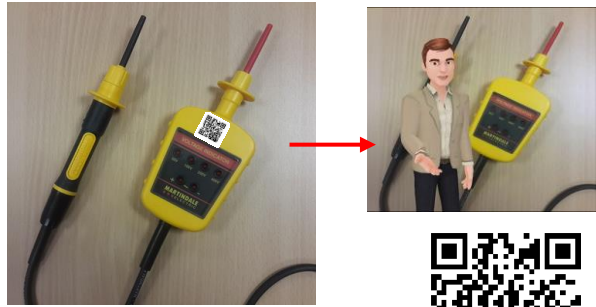


Apprentice Focus Group Comment

What would enhance your learning?
"Knowing what tools are called."
"How to use equipment such as micrometres."

Equipment and tools now provide links to learning through QR codes.

Below the Voltage Indicator tool now has a QR code which links to a video produced using the Tellagami App. The video explains the function of a voltage indicator and why it is important to use one. To see the video snap the QR code below.



QR code games provide a way for apprentices to learn the correct names and functions for tools and equipment.



Before

Machines were just machines



Apprentice Focus Group Comment

"It's great that we all have a machine but if you have a question then you have to wait

After

Machines provides self-help video support.



Below are some examples of the QR codes now available on machines.

your turn and if the Instructor is already answering someone else's question and there are 3 other people ahead of you then you have to wait. I had to wait half hour before my question was answered the other day."



How to centre a tool created by an engineering apprentice.



The process of blocking up, created by an Instructor, placed on a milling machine.

Challenge 2 – Access to technology

The engineering department had no Wi-Fi, no tablet computers and a ban on mobile phones because they distracted apprentices and are therefore a potential health and safety risk.

The workshop areas all have Wi-Fi access now and the organisation has three tablet computers. There is now the potential for all apprentices to utilise independent learning opportunities.

Before

No technologies in the workshop areas

Apprentices caught using mobile phones have them confiscated. Poster around the workshop areas reminded them.



After

Apprentices now have access to tablet devices to use the learning hotspots and are creating learning resources for their peers.



At present there are only three tablet devices but PETA are now considering purchasing more not only for the Engineering Department but for their business apprentices too. The project has opened up a discussion on whether the use of mobile phones will be allowed within the workshop areas, although permissions have not yet been granted. Instructors and managers are now more open to using them in a controlled way to allow apprentices access to learning.



Mobile Phones Banned

Roger Pearce, Chief Instructor, explains why PETA bans mobile phones in the Workshop areas.

Click on the images or follow PetaEngineers on Aurasma App point at the video to watch.

Here he explains why he accepts the use of tablet devices within workshop areas.



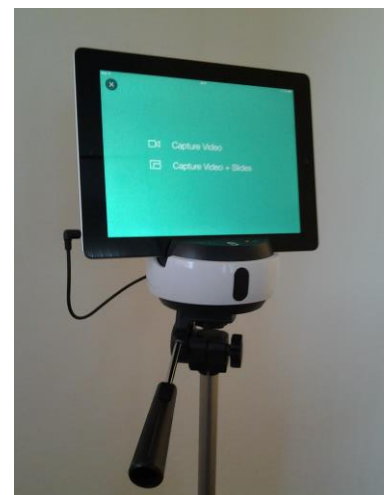
In addition to the tablets, PETA purchased a Swivl device. This was as a direct result of seeing one at The BETT Show and then asking other Learning Futures projects if they had any experience using the tool. The feedback from one of the organisations about the device convinced PETA that it was an investment worth making to enable the Instructors to record themselves.



Click on the image or scan the QR code to watch a video in which Ian explains his use of the Swivl device.

A Swivl device works with a tracking device the size of a USB stick which also includes a microphone. The user wears the tracking device on a lanyard, and uses it to start/stop recording. As the teacher moves the Swivl device will track them. The device can sit on any

standard tripod or a flat surface. Introduction of Swivl has had a positive impact on the quality of the videos produced by allowing the instructors to focus on the instructional element and not on holding a tablet device in the hand whilst trying to film and instruct.



Challenge 3 – Low digital literacy skills of Engineering Instructors

With no access to and use of technology within workshop space, instructors’ mobile and digital technology skills needed to be developed and their confidence/competence increased.

As a result of the project, the digital literacy skills of staff have increased full details in the **Impact Identified section**.

In this video, [Experience](#), Steve talks about the experience the Instructors had of using tablet devices prior to the project.









In this video clip, [Progress](#), you can see the journey travelled by one of the Instructors, Ian as he learns to take video using a tablet and edit it within YouTube. As his skills and confidence increases he begins to teach himself through the ‘How to’ guides given out in the workshops and by watching how other teaching practitioners are producing their videos.



Ian, an Engineering Instructor talks about the improvement of his skills and confidence levels and what this has meant to his apprentices.

Click on the image or follow PetaEngineers on Aurasma App point at the video to watch.

The instructors all gained the confidence and understanding of the technologies and tools they’d been using to explain why they wanted to use them with their learner groups.

Steve explains why he chose to make Blubbr video quizzes	Andy explains why he chose QR codes	Ian explains why he made learning videos
 <p>Why Blubbr</p> 	 <p>Why QR codes with Engineering Apprentices</p> 	 <p>Why learning videos</p> 



Sally Betts, Ideas4Learning, worked with the Instructors to develop their skills and confidence in using the technologies and software tools. Here she talks about their development and a particular challenge she met.

Click on the images or follow PetaEngineers on Aurasma App point at the video to watch.

Gavin Smith, talks about the impact he's seen on the Instructors as a result of talking part in the project.



Challenge 4 – Noisy and dirty learning environment

The workshop area is open and when machines are running it is very noisy making it difficult to hear a video on a tablet device. Using tablets in an environment where floors are concrete and the machines are oily does not provide a tablet long life span.

As part of the project the Instructors were asked to select the right tablet for them and to decide which type of casing would best suit their learning environment. In this video clip, [Tablet and case choices](#), Steve explains what influenced them to buy a Samsung tablet and why they chose to trial three different types of cases.



Tablet choice: Galaxy TabPRO (10.1, Wi-Fi)

Cases:

- OtterBox Case/Defender for 10.1 inch Galaxy Tab Pro/Note
- i-Blason Samsung Galaxy Tab Pro 10.1 Case - Armorbox Dual Layer Hybrid Full-body Protective Cover with Kickstand and Impact Resistant Bumpers
- Poetic Samsung Galaxy Tab Pro 10.1 Case - Protective Silicone Case

All the instructors agreed that the tablet they had chosen was suitable for their needs and they would recommend that more of the same tablets are purchased for the department. They felt the tablet had sufficient battery life to not need to be recharged during the day, it was easy to use and the right size to create and use learning resources. Instructors found they could only record videos during quiet times when they were they only one using a machine using the tablet's inbuilt microphone. Apprentices use earphones to listen to the recordings when the workshop area is noisy and in addition closed captions provide accessibility support. Below provides feedback on the tablet cases:

*“The Otterbox Defender series rugged protection, it was suitable for workshop sessions.”
However, it does need a screen cover and we do need screen wipes, as it comes back
from students covered in greasy fingerprints! Would recommend.”*

*“i-Blason – easy to hold, it has a good rubber grip and stand. However, the case is not
very robust and would not give much protection if knocked or dropped. Would not
recommend for our learning environment.”*

*“Poetic – made of rubber, it did offer some improved grip when the tablet was held or
placed on an uneven surface but it was flimsy and without care the tablet could ‘pop out’
of the casing leaving the user just holding the rubber case. Would not recommend for our
learning environment.”*

Impact identified

1. Confidence and Competence of instructors

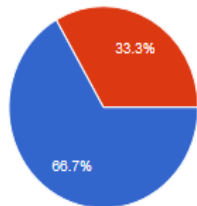
The instructors took a baseline digital literacy skills assessment at the start and end of the project to measure distance travelled. Instructors were asked to rate themselves on a 5 point scale against the skills that were to be delivered within the workshops.

The results show that the digital learning skills of the three instructors increased greatly not just in the areas they focussed on but across the board. The results show that in every aspect of the CPD training delivered to the Instructors they felt that their skills levels had improved. The data shows that for most of the skills covered within the workshop training the Instructors had no previous experience at all, so that even after the project time they are still not rating themselves against a fully confident level.

Because one Instructor had no experience at all of using tablet devices the digital literacy skills questions were amended to link tablet devices and Smartphones as the skills are transferable. The following table shows the results baseline results alongside the post-project results.

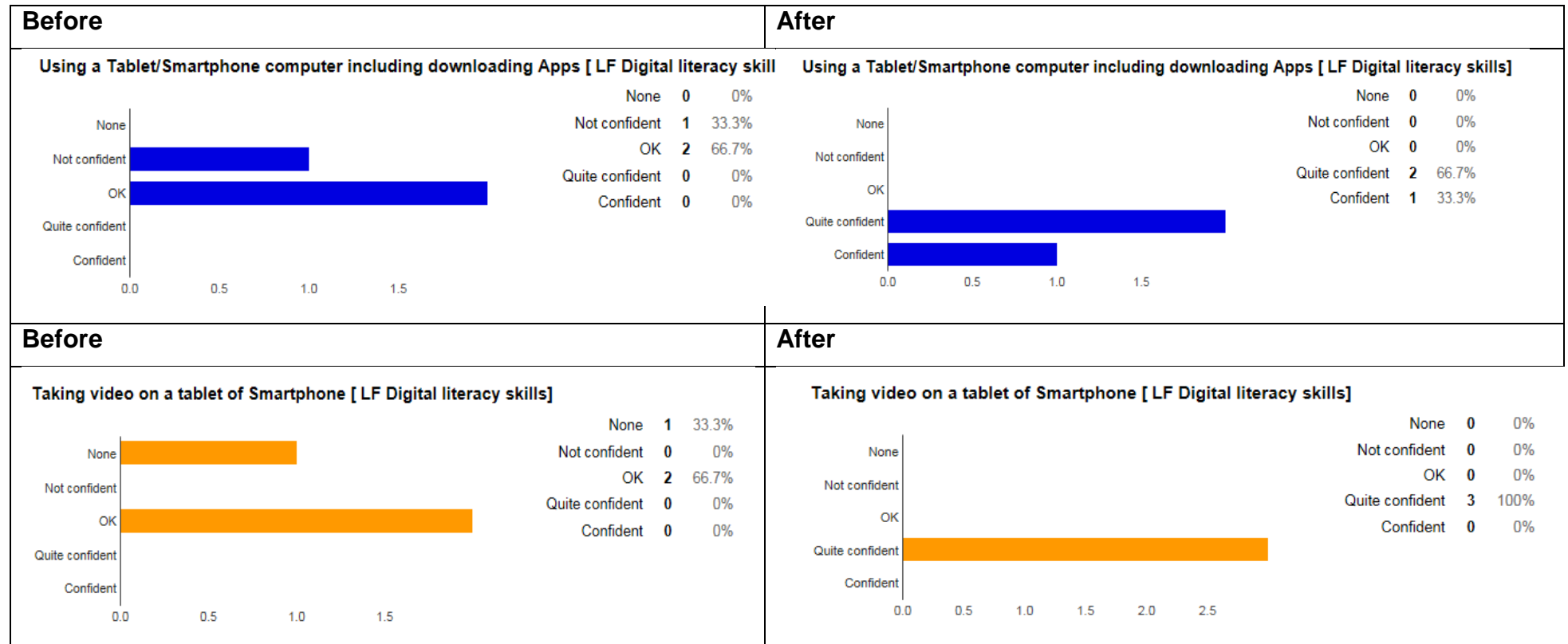
Questionnaire results

Have you used a tablet computer before starting this project?

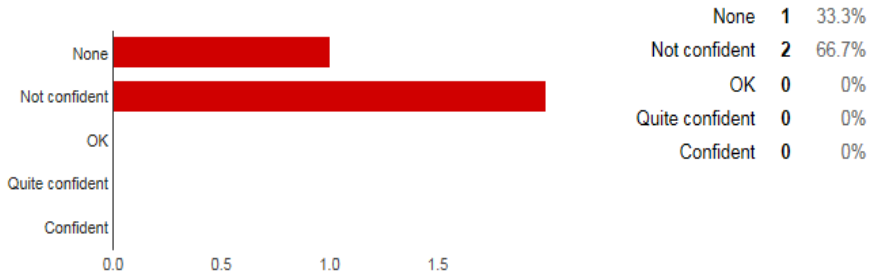


Yes	2	66.7%
No	1	33.3%

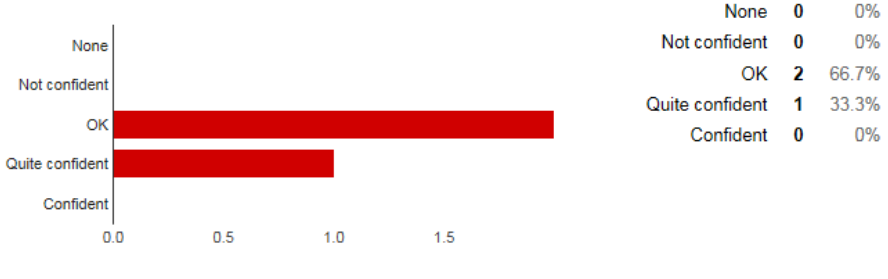
How would you rate your skills levels against each of the following?



Uploading video to YouTube [LF Digital literacy skills]

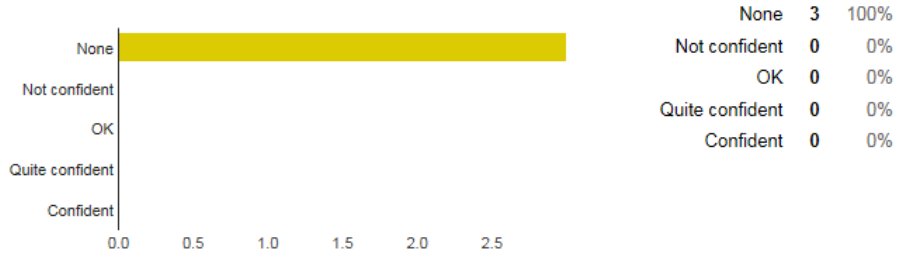


Uploading video to YouTube [LF Digital literacy skills]

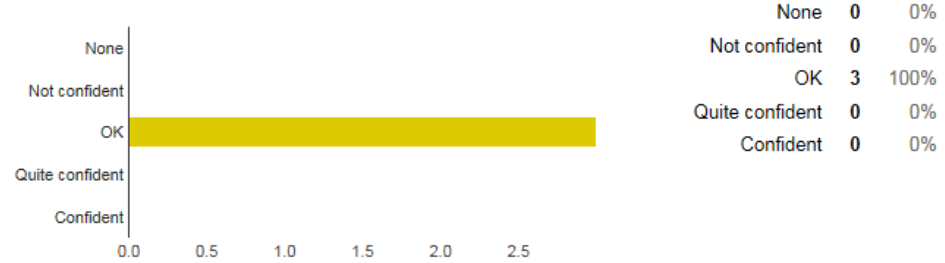


How would you rate your skills levels against each of the following?

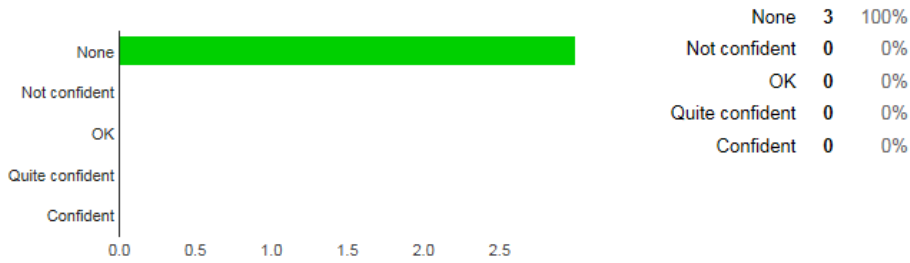
Editing video in YouTube [LF Digital literacy skills]



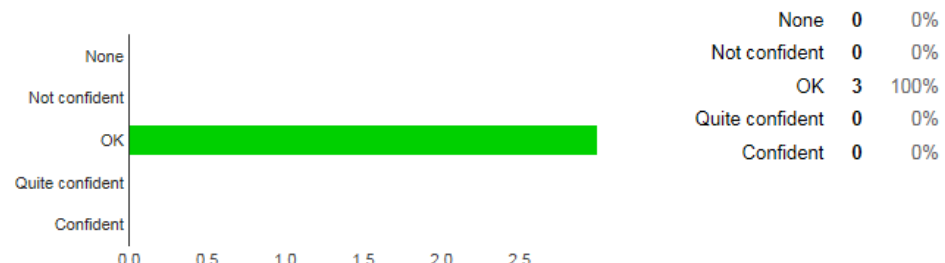
Editing video in YouTube [LF Digital literacy skills]

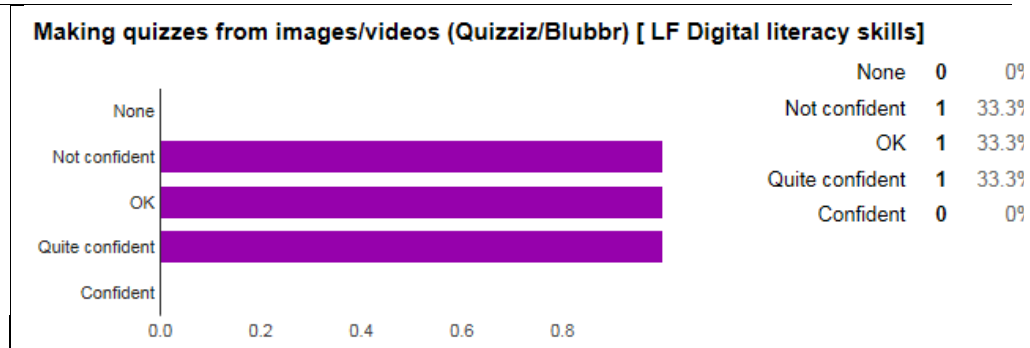
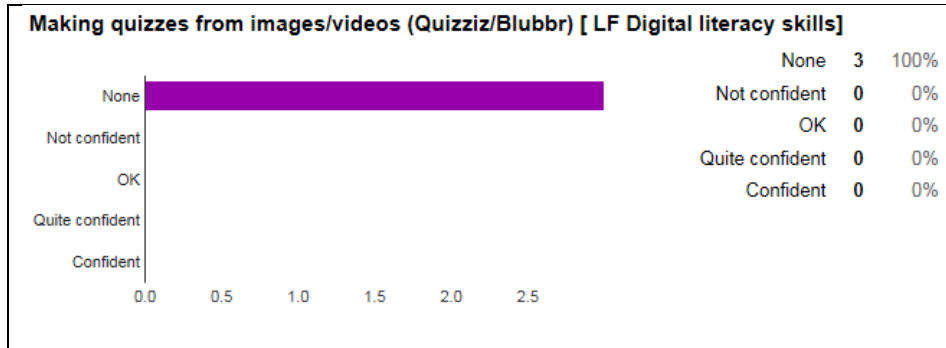


Adding captions to YouTube videos [LF Digital literacy skills]

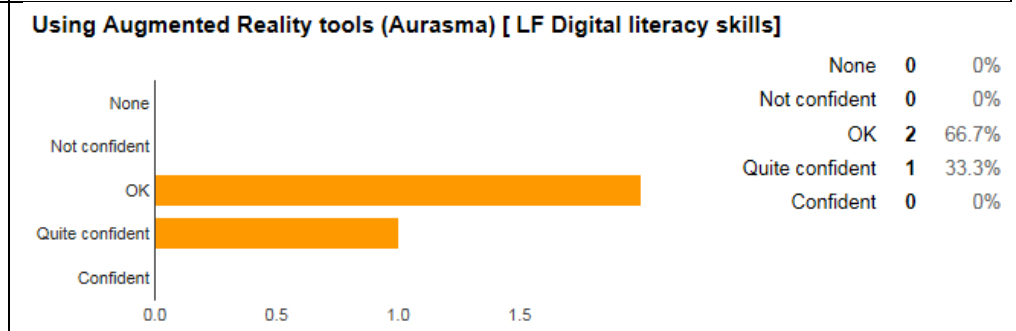
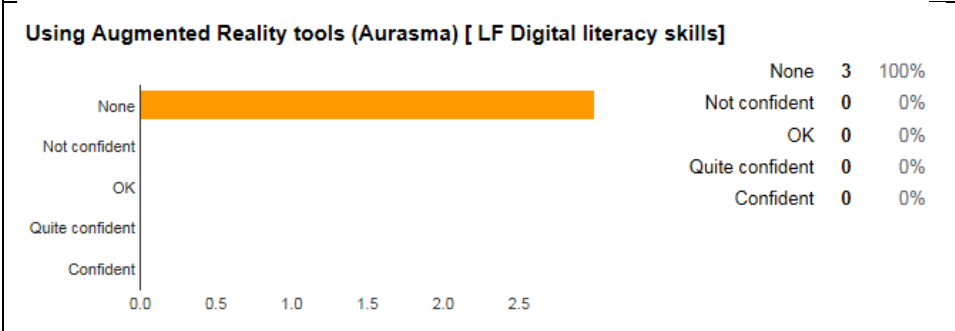
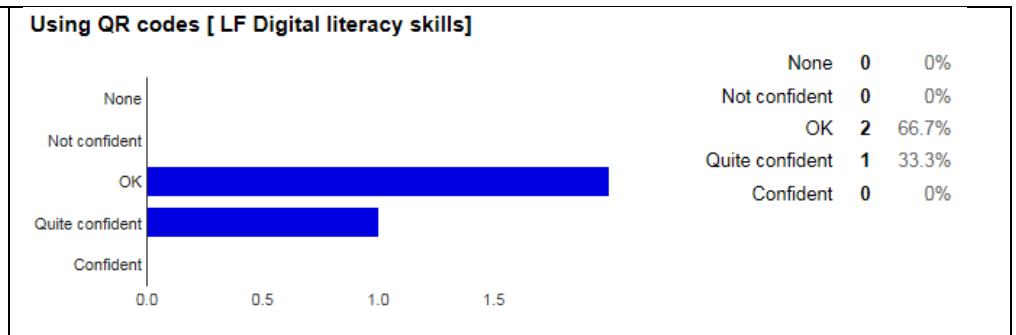
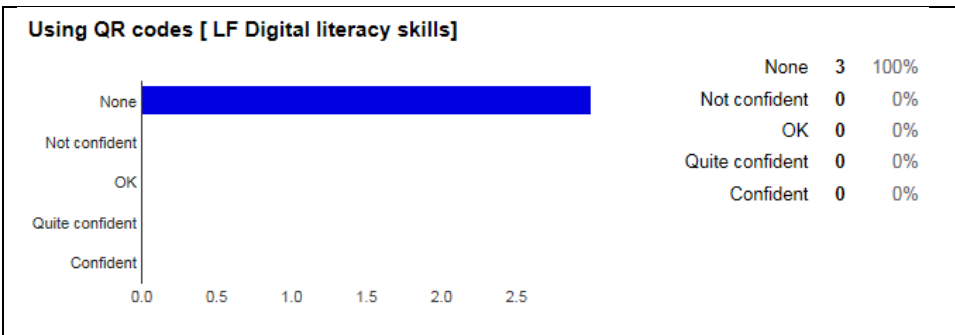


Adding captions to YouTube videos [LF Digital literacy skills]








How would you rate your skills levels against each of the following?



When viewing one of the final resources produced by each Instructor, you might think that they were underestimating their skills levels. However, the question they were asked combined their skills and confidence and it is the latter that the Instructors feel they still need to continue developing.

<p>Steve specialised in video quizzes using Blubbr. He also developed Moodle Lesson skills prior to leaving the company.</p>  <p>Bearings and Gears</p>	<p>Andy specialised in using QR codes. He also produced a Tellagami video uploaded to YouTube and Quizizz game.</p>  <p>Voltage Indicator</p>	<p>Ian specialised in making learning videos, to be accessed via QR codes and Augmented Reality Apps.</p>  <p>Turning Trigonometry</p>
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To capture skills development Instructors were encouraged not to delete resources made during workshops and practice sessions so that they could look back on their progress. Ian’s development can be seen in the **Challenges Overcome, Challenge 3 Section**.



In this video Sally explains that although the YouTube editing tool allowed videos to be improved, it didn’t enable finer detailed edits. This may have contributed to Instructors lack of confidence in their finished product but in reality they would not have time to do that level of editing. Click on the image or follow PetaEngineers on Aurasma App to watch the video.

To capture differences in confidence levels and attitude to mobile technologies Instructors were encouraged to post reflective messages and they were interviewed.

During the project:

“First video uploaded to You Tube recorded in Peta Machine Shop on Samsung Tablet. Some editing done and captions added. Looking forward to making more videos in the near future and becoming more competent with techniques and editing.”

“The video demonstrates filming requires at least 2 people, a firm steady camera/tablet support, patience and a head full of ideas.”

“The video is far from perfect with poor cutting of transitions but a good test to show what can be achieved using basic tools/software. Advice will be passed to other users and their ideas incorporated into future work.”

Final evaluation:

“The training was of a high standard, although more is needed.”

“The training and the ability to go through one to one with someone patient and knowledgeable was a huge positive. Ideas could be developed and as I got more confident into design and content, I had the ability to discuss what I had done and adapt if required.”

“My skills have greatly improved and I am using them on a regular basis.”

“I’ve learnt a great deal using digital technology to improve the learners’ experience. I’ve had fun learning new skills and developing them.”

“I would like to develop further and include the learners more with suggestions and ideas coming from them. I think it makes it more fun and enjoyable for them, so they are engaged and learning takes place.”

And their next steps:

“Make further videos and integrate these in the delivery of the learning criteria.”

“New skills put to use to develop a Moodle site incorporating video and interactive quizzes.”

2. Peer Learning and Support

The Instructors were asked to comment on what they had found the benefits of working alongside each other were:

“The exchange of ideas and giving feedback on videos made by each individual.”

“We shared information and support. As a team you can all bring forward good ideas, varied ideas and ones that can be shared and discussed. Working with colleagues always brings a small measure of competitive spirit and this can assist in the drive to produce a quality product.”

“We were able to talk about the resources we were developing and what worked and did not work with learners. This was of great benefit as we were then able to improve resources to suite our learning environment, this then improved the learners’ experience.”

3. Impact on PETA Staff

During the project informal and formal dissemination of the training occurred. The Instructors showed colleagues what they were doing during staff meetings, break times and during other training programmes.

In this video, [Steve talks](#) about how he believes the skills learnt are transferrable to other curriculum areas within both the engineering department and across the organisation.



Peter Huskinson became interested in what his colleague Ian was doing creating how to videos and as a result he used the **How to Use Moodle Lesson** guide. He taught himself how to create a resource using existing YouTube video clips.

Peter, saw the potential of recording how to video clips to show how to use the CNC programming tools. With the support of the project trainer, IT supplied a free screen capture tool and Peter is now in the process of developing his own how to video guides

A staff dissemination/training event and employer event were held at the end of the project to make the rest of the staff within PETA aware of the potential of video learning. The event included members of staff across the organisation not just those teaching on apprenticeship programmes. As a result **35** staff have an awareness of the use of video learning through hotspots; this included 8 managers, corporate staff and administrators.

In addition staff members within the engineering and business teams have had had the opportunity to developed skills in the creation and use of QR codes and augmented reality. At the start of their training/dissemination event the teams were asked a number of questions:

- Do you use video with learners? 67% yes
- Do you create your own videos? 83% no
- Have you used the YouTube editing tools? 100% no
- Do you know what a QR code is? 67% yes
- Do you know what augmented reality is? 100% no

When asked what they would do as a result of attending the event, comments included:

“Look into creating QR codes for quizzes.”

“Make video so learners can see them in their own time.”

“Linking of a YouTube video to a QR code or AR would be useful.”

“To make quizzes to use for progress checking.”

“Implement AR in all areas. Firstly in the practical areas (machining, mechanical, welding and electrical) then in lessons (engineering and functional skills).”

Augmented reality was extremely well received by all staff, they liked the instant access to the videos. They thought it was much quicker, requiring less time from a learner perspective than QR codes.

In this clip, Sarah talks about what she'd like to now do with business learners as a result of the training she has received.

Click on the image or follow PetaEngineers on Aurasma App to watch the video.



4. Impact on engineering apprentices

During the Focus Group, attended by 7 apprentices on different engineering apprenticeships, they explained that learning in the workshop area consisted of a practical demonstration and they'd each then go and work on their own machine. The group were happy and accepted this style of delivery. It wasn't until they were asked about what happened when they got stuck that they explained how frustrating this could be:

"It's great that we all have a machine but if you have a question then you have to wait your turn and if the Instructor is already answering someone else's question and there are 3 other people ahead of you then you have to wait. I had to wait half hour before my question was answered the other day."

When asked if he was stuck on something complicated, he responded that it was something simple but he didn't want to make a mistake. The other apprentices confirmed that on lots of occasions the support they want is more about reassurance or they had simply forgotten the next step.

Day release apprentices said they'd welcome photos or videos of processes to jog their memories when they'd not been able to complete a full write up and came back to it a week later.

Trigonometry seemed to be an area in maths that many of the apprentices were finding difficult.

As a result of these points raised within the focus group, Ian began to make learning videos to support the apprentices. He then engaged existing apprentices to make videos for the next intake of apprentices. Ian's videos and those of his apprentices will be used by the apprentices in 2015/16 but his existing apprentices watched and tried out the hotspot video access and agreed they would be useful.

In this video clip you can hear an interview with Adam and Ben who made two of the learning videos, explain why they made them and why they think they will benefit future apprentices.



[Apprentices talk about video learning](#)

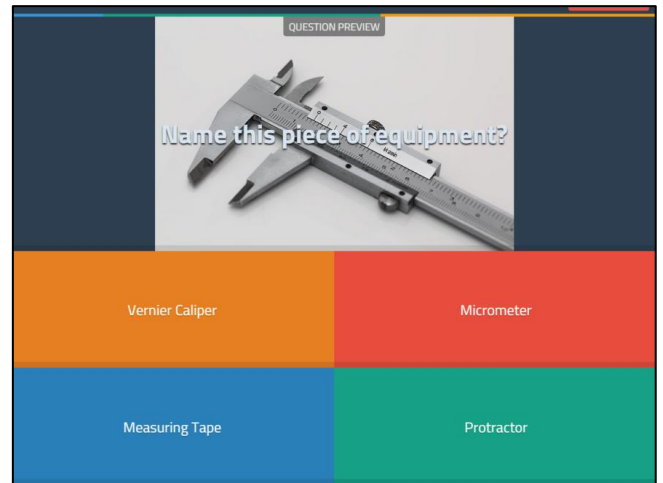


During the focus group, apprentices also said that they would have benefited from knowing the names and functions of tools when they started. They explained that many of the tools/equipment looked very similar and it took a while to understand which tool was which

or what the function of something was. Andy and Steve acted on this producing resources to help students learn the names and functions of tools and equipment.



Steve's Blubbr resources



Andy's Quizizz Quiz

Steve's learners tried out the Blubbr resources his feedback on their experience:

"First impressions were promising, keeping them engaged in learning whilst testing using quizzes. They said they would return to attain better scores."

Andy's apprentices experience:

"My learners were able to use the tablet to scan codes next to images of the tools and access a description of it. They played the game I developed matching the images to the description which they did in pairs."

All instructors agreed that the true impact of the resources would not be felt until this new academic year with the new intake of apprentices. Listen to [Roger Pearce, Chief Instructor](#) who had the original idea for learning hotspots as he reflects on the distance travelled and the future.



5. Impact on the organisation

This was the first technology related CPD project that PETA had applied for Gavin Smith, Senior Manager would recommend that other work-based learning providers considered doing so to.

"Bidding for project money related to technologies is worthwhile, it is changing the practice of our Engineering staff. It is something Peta hasn't done before because of the fear of the time commitment this would involve. As a small WBL provider releasing staff for training/resource development and managers to attend shared practice events is something we have to consider very carefully before applying – cost (in terms of time)/benefit analysis. This is our first technologies related bid because of these considerations and it might be why other WBL providers do not even consider doing so."

In this video Gavin talks about the impact on the organisation.

He explains that at the start of the project some of the staff were worried about what the introduction of learning technologies might have to their jobs. He also provides an example of how a senior administrator has picked up on the idea of QR codes to help with paperwork.

Click on the image or follow PetaEngineers on Aurasma App to watch the video.



The key areas of impact on the organisation are:

- Skills improvement of staff – video, mobile technologies, online software tools;
- Changing department view on the value of mobile technology in Engineering;
- Cross department interest in the use of learning technologies as a result of seeing it used in engineering;
- Learning from other providers and seeing what they are doing has broadened our horizons
- A determination to introduce video from industry through closer work with employers.

6. Impact on Employers

Within PETA's diary they hold an Employer Event in September each year. It was decided to tap into this event, so that the resources would be available to demonstrate to employers, it was felt it would be easier to explain how PETA wanted to move to the next stage to engage with employers and with their support capture video from industry that could then be used with apprentices.

The event is open to any local business, not just those from engineering companies. The project had a prominent stand and the opportunity to talk to participants. The event was attended by 111 employers from 73 companies.



Gavin and Sally got the opportunity to demonstrate and talk to individual employers over the lunch period where they demonstrated the use of both QR codes and augmented reality.

There were mixed reactions to QR codes, employers weren't convinced about them as a tool for their own businesses.

"We've tried QR codes as a way to provide contact details but we've abandoned that idea – most of our customers didn't know how to use them or couldn't get them to work. Actually I've never seen anyone successfully use one."

At that point we demonstrated the use of one to a learning video and the three employers all agreed that they had a place to link with learning materials.

Augmented reality had a greater impact with employers, they could see the potential to deliver learning and enjoyed using the tablets and Aurasma App. They could also see potential for their use within their own organisations – to link posters to policies or a video. To turn a brochure picture into a video tour.

As a result of the event, PETA are now following up with three employers to take forward the final aspect of the project the line of sight video. Using the dissemination event was a useful way of accessing and explaining the needs of the apprenticeship teams.

Key learning points

Gavin identified three key learning points from the project to pass to other providers which he details in the video: the team, time and quality.

Click on the image or follow PetaEngineers on Aurasma App to watch the video.



The key factors to our success were:

- Recognising that we would need support and identifying a partner organisation (Ideas4Learning) who could not only deliver our training and day to day management of the project but would also be flexible adapting to our needs;
- Involving everyone with the initial bid, especially IT Support;
- Handing key decisions to Instructors to give them ownership of the project, what tablets to purchase and what resources they wanted to make;
- Providing work packages so that everyone knew and agreed to their roles and responsibilities;
- Sending Instructors home to familiarise themselves with the devices over a holiday period. They had self-taught and peer supported each other on the basics prior to any formal training;

- Building in time for Instructors to practise and gain confidence, although it wasn't enough;
- Adapting to the individual needs of Instructors both in terms of what they wanted to produce but also in the speed at which they developed skills;
- Providing individual support to Instructors this not only enabled Instructors to continue developing skills along their chosen paths but at times helped to re-engage when busy work commitments got in the way;
- Listening to and involving learners;
- Involving a senior manager in all aspects – having overall project responsibility and attending training workshops as well as sharing practice and dissemination events;
- Making use of opportunities already in the diary – for example the Employer Event, reduced costs by piggy-backing on another strand of the company's budget;
- Attending Sharing Practice events allowed us to see what other providers were doing, find out about software and technologies and to find common interests. These were invaluable as they enabled PETA to hear what other providers were doing and to learn about new technologies and tools. The purchase of a Swivl device and the use of Quizizz was as a direct result of attending one of these events;
- Sending two people to the Sharing Practice events meant that we could see more and network more widely;
- Listening to our Industry Mentor, when struggling to get Instructors to accept that their videos were high enough quality, they were doing them for their students – not the BBC, the Industry Mentor's feedback that they were fit for purpose was a break through with staff and they moved on to create further resources.

Things we'd do differently:

- Plan more than four workshops, covering fewer skills each session and more practise time on each;
- Plan for more developmental time for resources per week – creating resources takes a lot longer than you think, especially when learning from scratch;
- Consider sticking to one area within engineering department rather than three, that way more resources would be created in a single area within the time period;
- Possibly make one employer, a partner on the project to get their input from the beginning;
- Increase the amount tendered for to allow more training time, practise time and to allow much more time to produce the final resources and report. We wanted to create an online video case study and although we created all the artefacts lack of time prevented it being assembled;
- Ask for final report and resource templates, together with writing guidelines on Day 1;
- At the beginning of the project, the instructors all had their own YouTube Channels, in hindsight we wish we had set up the one PetaEngineers' channel at the beginning where they would all post their videos. Creating the project channel later on meant that when some of the videos were transferred the closed captions had to be re-created.

Tips to other instructors

Ian's tip to other instructors is to encourage engineering apprentices to make learning videos. He sees it as a win-win situation, his reasons are:

- apprentices select the tasks, choosing things where they would have liked a learning hotspot;
- it reinforces their learning and build confidence;
- if the video is accurate then it becomes an instant learning hotspot;
- if the video is inaccurate, it becomes a teaching tool for those apprentices and for future ones – identifying the errors, explaining why and describing what should have been done differently;
- it saves you time in making them.

Sustainability

The training resources are now available for all existing and future members of staff to use to develop their skills. PETA will use the trained instructors to support their peers in engineering, ICT and business.

“The CPD materials we have developed as a result of this project will be really useful to us for future staff training. Instead of running half or full days training session, we will run lighter touch training and use the materials to allow staff to continue to self-develop throughout at their own time and pace.” Gavin

PETA is looking into investing in additional tablets and Swivl devices, not only for the engineering department but for the business areas too. In addition the discussions have begun on the 'controlled' use of apprentices own mobile devices.

Engineering Instructors plan to continue making video learning resources through the year as they teach the new subjects. They will continue to make resources themselves, via their learners and now with the identified employers.

PETA are talking to Portsmouth University to find ways of taking augmented reality to the next stage. Our instructors are now able to do the basics but do not have the time or currently the skills to develop what they now see as a really useful tool for learning in engineering to the next level. Project work undertaken by final year degree students and masters' students looks as if it could provide a means to achieve this.

Resources

- **Session – The YouTube editor;**
Session plan providing facilitator notes and links to associated handouts and resources to deliver a session on the YouTube editor. The plan contains full details of the technologies and software requirements to deliver the session.
- **How to – Edit engineering videos in YouTube;**
A how to guide on using the YouTube editing tools. The guide can be used by individual teachers or as part of a session. Examples are included from engineering practice within the guide.
- **How to – Join video clips in Youtube;**
A guide on how to join a number of YouTube clips together using the YouTube editing tools. The guide can be used by individual teachers or as part of a session. Examples are included from engineering practice within the guide.
- **How to – Create videos from images in YouTube;**
A guide to creating videos from images using YouTube's inbuilt tool. The guide can be used by individual teachers or as part of a session. Examples are included from engineering practice within the guide.
- **How to – Add closed captions to YouTube videos;**
A guide on how to add closed captions to a video within the YouTube editor tools. The guide can be used by individual teachers or as part of a session. Examples are included from engineering practice within the guide.
- **Session – Creating assessment resources;**
Session plan providing facilitator notes and links to associated handouts and resources to deliver a session on using the online tools Blubbr and Quizziz to create assessment resources. The plan contains full details of the technologies and software requirements to deliver the session.
- **How to – create video quizzes using Blubbr;**
A guide showing how to produce quizzes using the online Blubbr tool. Blubbr quizzes require Flash, so if accessing them on a mobile device they should be viewed using the Puffin web browser. The guide can be used by individual teachers or as part of a session. Examples are included from engineering practice within the guide.
- **Resource – Nuts quiz;**
A Word version of the Nuts Blubbr quiz.
- **Quiz Blubbr – Nuts Quiz;**
The online [Nuts Blubbr quiz](#) can be accessed here. Blubbr quizzes require Flash, so if accessing them on a mobile device they should be viewed using the Puffin web browser.
- **Resource – Bearings and gears quiz;**
A Word version of the Bearings and gears Blubbr quiz.
- **Quiz Blubbr – Bearings and gears quiz;**
The online [Bearings and gears Blubbr quiz](#) can be accessed here. Blubbr quizzes require Flash, so if accessing them on a mobile device they should be viewed using the Puffin web browser.
- **Resource Keys quiz;**

A Word version of the Keys Blubbr quiz.

- **Quiz Blubbr – Keys quiz;**

The online [Keys Blubbr quiz](#) can be accessed here. Blubbr quizzes require Flash, so if accessing them on a mobile device they should be viewed using the Puffin web browser.

- **Resource – Washers quiz;**

A Word version of the Washers Blubbr quiz.

- **Quiz Blubbr – Washers quiz;**

The online [Washers Blubbr quiz](#) can be accessed here. Blubbr quizzes require Flash, so if accessing them on a mobile device they should be viewed using the Puffin web browser.

- **How to – create quizzes using Quizizz;**

A detailed guide showing how to produce and run quizzes using the online tool Quizizz which creates quizzes based on images. The quizzes are used played by the whole class at the same time. Results from the quiz can be downloaded to a spreadsheet. The guide can be used by individual teachers or as part of a session. Examples are included from engineering practice within the guide.

- **Resource – Low voltage electrical equipment quiz;**

A Word version of the Low voltage electrical equipment quiz.

- **Quiz Quizizz – Low voltage electrical equipment quiz;**

The online [Low voltage and electrical equipment quiz](#) can be accessed here. The teacher opens and runs the quiz and learners join via mobile devices. Quiz results can be saved. Full details of how to run a quiz are given in the associated guide, How to – create quizzes using Quizizz.

- **Session – Creating QR codes and Augmented Reality resources;**

Session plan providing facilitator notes and links to associated handouts and resources to deliver a session on producing QR codes and Augmented Reality resources. The plan contains full details of the technologies and software requirements to deliver the session.

- **How to – Create QR codes;**

A guide showing how to create and read QR codes. The guide can be used by individual teachers or as part of a session. Examples are included from engineering practice within the guide.

- **Resource – Equipment and tools QR codes;**

A Word resource showing examples of QR codes being used in Engineering. It includes video clips from Instructors and Apprentices.

- **Resource – Electrical equipment QR code game;**

A Word version of a QR code game where learners are asked to match photos to descriptions and use the QR codes to check answers. The game can be re-created from this resource.

- **How to – create Augmented Reality resources;**

A guide showing how to create and play augmented reality resources using Aurasma Studio and the Aurasma App. Full details are provided within the resource. The guide can be used by individual teachers or as part of a session. Examples are included from engineering practice within the guide.

- **Resource – Augmented reality;**
A Word resource showing examples of Augmented Reality resources being used in Engineering.
- **Session – Creating learning modules using Moodle Lesson;**
Session plan providing facilitator notes and links to associated handouts and resources to deliver a session covering an introduction to instructional design and the use of the Moodle Lesson tool. The plan contains full details of the technologies and software requirements to deliver the session.
- **How to – Use Lesson;**
A guide showing how to use the Moodle Lesson tool. The guide can be used by individual teachers or as part of a session.
- **Video resource – Blocking up;**
A YouTube video resource, format MP4 it shows the process of blocking up on a milling machine.
- **Video resource – How to centre a tool;**
A YouTube video resource, format MP4, produced by two engineering apprentices, showing how to centre a tool on a lathe.
- **Video resource – Setting the tool height on the lathe;**
A YouTube video resource, format MP4, produced by two engineering apprentices, showing how to set the tool height on a lathe.
- **Video resource – Turning trigonometry;**
A YouTube video, format MP4, showing how to do the mathematics required for a specific assignment – creating a taper.
- **Video resource – Voltage indicator;**
A YouTube video, format MP4, created and exported from the Tellagami App. The video explains the purpose and importance of a voltage indicator to electrical engineering apprentices.