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LEARNING FUTURES PROGRAMME

FINAL REPORT

Performing Engineering Operations Digital Learning Assets

Furness College

BAE Systems (Barrow-in-Furness)

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Performing Engineering Operations Digital Learning Assets

Working with an “Outstanding” engineering team to drive up the use of learning technology with the support of new apprentices in Digital Learning Design and improve student satisfaction of LTA.

Furness College

Furness College working with BAE Systems to create and support the use of learning technology in the skills development of their apprenticeships.

Project summary

The PEO Digital Learning Asset programme was created to develop staff confidence, skills and knowledge of using learning technology within one particular curriculum area, i.e. craft engineering. The Engineering team have outstanding vocational skills and use a range of techniques in their teaching, learning and assessment practices. However their use of technology to enrich and change the classroom based learning needed a considerable amount of coaching, mentoring and developing. The team have collaborated with BAE Systems to co-develop the materials that will enhance the skills that employers are seeking.

Two Digital Learning Design apprentices were employed by the College to help with the development of the use of learning technologies within the College. The PEO project has given them outstanding sources of evidence for their apprenticeship and developed their skills and knowledge very quickly.

The development of the interactive learning package was crucial to support the delivery of Performing Engineering Operations course, whereby learners are required to study independently the underpinning knowledge for this qualification. The use of a number of techniques to engage the learners such as gaming, collaborative learning and mobile learning will enhance the students learning experience.

The project aims to model how to change pedagogy in one key curriculum area and to take the framework and processes used to transform practice in others.

Who should read this report and why

This report will interest those who:

- wish to develop the skills and confidence is using learning technology with engineering teams;
- develop cpd frameworks in the use of learning technology, specifically with the use of video, gamification and creating tailored elearning material;
- work with employers to develop the use of learning technology:

- increase learner satisfaction and use of the learning technology;
- wish to develop a strategy for engaging with governing bodies, leaders and managers;
- wish to develop in-house expertise in the use of learning technology via an apprenticeship programme.

CPD resources developed

- 6 PEO digital assets for units on the PEO qualification (refer to final section)
- Template used by lecturers and development team for creating elearning materials
- Video of learners and staff feedback for the project
- Do and Don'ts of creating elearning materials and videos
- Diagram of CPD strands and strategy

Project lead contact details

Jo Anson
Director of HE
Channelside
Barrow-in-Furness, LA14 2PJ
Tel: 01229 844791
Mob: 07515 065548
Email: Jo.Anson@Furness.ac.uk

Furness College is an incorporated general FE college situated in the industrial and relatively isolated town of Barrow-in-Furness, Cumbria. The college occupies a single, purpose-built campus close to the town centre. Within its catchment area there is a sixth form college, two secondary schools with sixth forms and a private school with a sixth form. There are also four 11-16 schools and several private providers of work-based learning. One of the secondary schools is a new Academy that has replaced three predecessor schools and moved to a single site.

The College provides vocational training from entry level to level 7. A large amount of college provision falls within STEM (Science, Technology, Engineering and Maths). STEM accounts for 73% of provision in HE and this has grown from 64% over the last 4 years. Similarly STEM in workplace learning has grown from 49% to 65% over the same period whilst classroom learning has grown from 60% to 76%.

Members of partnership

BAE Systems in Barrow-in-Furness design, manufacture, and support complex surface ships, submarines, torpedoes, radars, and command and combat systems. They have been part of the PEO project in developing and evaluating the digital material. The college works collaboratively with BAE Systems on the delivery of their apprenticeship programme, recruitment from full-time learners and the growth in HNC and BEng programmes at higher levels. All apprentices and full-time engineering students undertake the PEO qualification as part of the apprenticeship framework. BAE Systems input and evaluations have been critical to the success of the project.

What the project set out to do and why

The main challenge was to work with a growing team of engineering lecturers to improve their skills and confidence in their use of learning technology. As the largest curriculum area within the college and lecturing staff being recruited constantly to meet the growing engineering demands, it was important to ensure that their use of learning technology was at the heart of the teaching, learning and assessment good practice. The PEO project was the vehicle used to develop the teams approach. Workshop and practical activities were outstanding, however the classroom-based lessons were less well developed and learner satisfaction had dropped by 11%.

The process

Two “Digital Learning Design” apprentices were recruited to develop the College’s own ability to create and develop the use of learning technologies.

A Learning Resource Manager was appointed to drive the culture change required in the light of the FELTAG report.

A number of Learning Mentors (already in place) were identified to be champions of learning technology and a programme of sharing good practice in the use of technology was put in place.

A baseline ILT skills audit of all lecturing and assessing staff was conducted to identify curriculum areas with the most need and specific skills required to be developed.

A whole college approach for INSET days was planned for the academic year:

- One day TLA conference for all lecturing/assessing staff in October for with focus on Blended/Flipped learning and the use of learning technology;
- One day TLA workshops for all lecturing/assessing staff in February disseminating good practice on Designing blended learning materials and interactive apps (e.g. Kahoot, Zaption, and Classcraft);

- Two day TLA workshops for all lecturing/assessing staff in July disseminating good practice on use of the VLE, interactive learning, mobile learning, blended learning.

Specific CPD activities were planned for Engineering lecturers and workshop sessions for all staff with development of a flipped approach to have a greater reach:

- Sessions included collaborative apps, use of google docs, zaption and embedding video and the use of Kahoot.

The creation of the PEO digital materials was a long process using the skills of a number of people. Namely:

- Learning Resources Manager who was responsible for the project management and logistics of the project;
- Two digital learning apprentices who were responsible for the creation of the materials with support from senior learning coach who had worked on previous elearning projects. The use and skills development of Articulate Storyline and video creation/editing was key to the project;
- The skills and expertise of key enthusiastic engineering lecturers who created videos and constructed the elearning content with specific development sessions to enable their creation. This involved using templates and guidance on changing a classroom based lesson into an interactive online session;
- All the team involved in quality checking the materials for punctuation, grammar, pedagogy, video linkage;
- The use of the key BAE staff to review and suggest improvements;
- Trials with groups of students in the review and assessment of the materials.

For the Governing body, leaders and managers, briefings and updates were given on the progress and demonstrations of the project materials to ensure awareness was college wide. For example this dissemination occurred at the Quality Improvement Group; Senior Management Team; Governing body Learner Experience committee; BAE contract review meetings. This culminated in a full presentation to the Governing board with review of the FE sector, funding implications, the FELTAG report and what the college has done to tackle the use of the learning technology.

The results

Challenges overcome

Overall the project has been a great success:

- Student satisfaction and achievements have shown a great improvement;
- Video evidence of the student satisfaction is also evident with the use of learning technologies. (Section final section);
- BAE Systems praised the project and digital learning materials and will be using with their own apprentices and will encourage all the learners to use these

materials. Some changes will be made to enable the ship-building elements to be brought out in the use of the terminology;
- OFTSED rated the provision in Engineering as OUTSTANDING with particular reference to the use of learning technologies;
- STAFF confidence and use of learning technologies within the Engineering team has grown.

Impact identified

Impact Measures

People Engaged	Leaders & Governors	Practitioners/ Assessors	Technical Teams	Learners	Employers
Baseline 2013-14	0	0	1	173 90% success	0
Numbers Involved Planned(end)	25	15	6	298	10
Numbers Involved Actual(end)	34	97	6	91.4% success with 330 learners 333 for 15/16	9
Measureable Impact - Planned	Changes to delivery patterns, development and staffing costs analysis Scalability impact	Baseline data on staff confidence and ability to use technology After project data gathering on staff confidence/ability	Software, hardware costs, development time costs Skills developed	Success rates Student Voice (surveys, interviews, focus groups)	Review Meetings Employee voice (focus groups)
Measureable impact – actual	VLE usage and blended learning approach embedded Staffing costs identified.	ICT Skills audit plus follow up show a 11% rise in confidence, 25% rise of use of the VLE. Judgements by OFSTED rated provision as OUTSTANDING	Software and hardware purchased for the project, ie Articulate licences, camera £3200	Success rates improved with student satisfaction greatly improved	Workshops, review meetings with employers show great satisfaction with material

Student satisfaction has improved within the engineering area and across the college.

- In the student satisfaction survey the question "Materials on the VLE help with my learning" the satisfaction rose from 89% (13/14) to 97% (14/15).
- Use of the specific VLE PEO units rose during the year as the units were fully developed.
    - In 2014-15
        - Unit 1 – Working safely in Engineering Environment had 297 and 219 during September and October respectively.
        - Unit 2 – Carrying out Engineering Activities had 300 hits up until November.
    - For the start of 2015/16
        - Unit 1 has already a combined number of hits of 1000 for September
        - Unit 2 number of hits of 104
        - Unit 3 number of hits 120.
        - This is representative of the module delivery in just 3 weeks.

Achievement rates have improved for the PEO qualification from 90% to 91.4%. This is very early data and the contribution of the digital learning material has not been gauged against this increase due to the delivery of the modules and the release of the elearning materials.

BAE Systems were asked to a number of workshops and a final analysis and comments were taken. Overall they found the digital material outstanding and praised all the hard work. Some comments are:

> *"There is a correct balance of checking of learning throughout the package. Too little will not ensure the learners have understood the content and too much may result in them feeling overwhelmed."*
>
> *"The instructions are very clear throughout the package. The simple layout makes it easy for all users particularly those who lack confidence in digital skills."*
>
> *"There are clear instructions with each of the learning activities as to what the learner has to do and good feedback on whether the activity has been completed correctly or they need to try again. This type of instant feedback is very useful and ensures learners have understood the subject before moving on."*

"The package does encourage independent learning. The interactivity enhances the learning experience and helps them absorb the information better while allowing them to deepen their learning of the subject (through the links to websites, further reading etc.). This type of active learning gives them a better understanding of subject rather than just reading text and cutting and pasting answers."

"The company will be promoting the learning materials to our apprentices to use from September and feel they will be beneficial in supporting the UPK. Going forward we would like to work with the college to make the packages more contextualised to shipbuilding. We would like to include nuclear and shipbuilding terminology that they use in the business and understand i.e forward, aft , port and starboard rather than north, south, east and west on technical drawings."

From the recent Ofsted Report of Furness College April 2015 which judged the Engineering provision as Outstanding (http://reports.ofsted.gov.uk/inspection-reports/find-inspection-report/provider/ELS/130633)

- Teachers use web-based technology expertly to test students' knowledge, promote their development and reward them for achieving excellence in lessons. Students enjoy these challenging opportunities to compete against their peers.
- Teachers make good use of learning resources, including the virtual learning environment, to enrich learning and to support apprentices' progress; apprentices use information learning technology frequently in lessons and also to research and present assessed work and, consequently, they develop good independent study skills.
- Teachers integrate information learning technology very effectively to develop students' self-study skills. They encourage students to use their mobile phones to participate in online quizzes, to research the meanings of words and to solve problems; for example, how to work out body mass index.
- A large majority of teachers and assessors are well qualified and use their extensive industrial experience to develop students' and apprentices' skills. They adapt inclusive learning technologies creatively to engage, motivate and challenge students in many lessons. Additionally, most teachers promote independent learning through the well-populated virtual learning environment and students benefit from this. Teachers use web-based technology expertly to test students' knowledge, promote their development and reward them for achieving excellence in lessons. Students enjoy these challenging opportunities to compete against their peers.

- Learning environments, workshops and resources for learners are very good. Managers collaborate with employers to provide current industry standard equipment in most areas. Students use innovative software programmes that motivate them and develop their skills (Leadership and Management).

Engineering Staff CPD Impact

Using the baseline skills audit conducted in October 2014 with a review of the Engineering team, the key findings were:

- Overall VLE use and other learning technology has increased by 25% in Engineering;
- The confidence levels of the staff are growing with a 11% improvement for the whole team;
- Guiding learners in the finding and evaluating info from the internet 61% to 89%;
- Explaining plagiarism and how to avoid it 44% to 72%;
- Know what e-safety means 83% to 100%;
- Explaining how to use social media to help their employability 50% to 83%.

The impact of this specific development has inspired or even challenged other Engineering lecturers (not involved in the project) to request elearning training/CPD delivered who were not involved in the project but wanted to elearnify their units in the same way. Discussed the process and gave them the sample online learning session template and blank template to start thinking about design and creating their materials.

"*The introduction of the PEO on-line resources has been huge success within the Craft Engineering team. It has allowed the development of the staff IT skills and to further enhance their lessons to include a more blended approach to students learning.*"

Curriculum Manager of Craft Engineering

"Learners have been able to benefit from these resources and taking ownership of their own learning alongside developing employability skills."

Head of Advanced Manufacturing

Impact on other Lecturing staff

- Led to the implementation of induction for full time learners being delivered online through Articulate, to provide on demand information and track participation and understanding of key information. This is also in development for apprentices.
- Development of online learning resources for Business. Recreating paper based activities through the interactivity of the VLE and Articulate
- Development of an Anatomy online unit for delivery on Hair and Beauty courses.
- Development of an online unit around Body Art for Beauty courses.
- Staff accessed the video service provided by the apprentices to film demonstrations which have been uploaded to the VLE and used within Zaption. Hair & Beauty
- Developmental work with the Functional Skills teams on layout of the VLE and transferring static content into video clips, interactive learning objects and use of screen casting.
- A funded project was commissioned with support from the Engineering and Health and Social Care team on developing materials on Alcohol awareness and impact on workshop practices.

Governing bodies and boards, Leaders and Managers

- Governors, leaders and managers have been briefed over the full academic year with ongoing reminders and progress reporting. Decision making over the investment on the project has been discussed and approved at all levels of the management.
- Final report and outcomes will be fed back into a number of management and governing body meetings during October 2015.

Creation of PEO digital learning material : breakdown of costs

Per 30 GLH module (data based towards the end of the project)

Activity	Hours
Planning and preparation of engineering staff	5
Creating materials and identifying resources by the engineering staff	40
Elearnification of materials by apprentices	60
Quality checking	5
Review by engineering staff, project lead, apprentices	12
Total	120

Therefore for 30 GLH of material a total of 120 hours was spent by a variety of staff in creating the Digital asset. It should also be noted that this is based on no video creation. Making, editing and QA a video is a lengthy process with approximately 5 minutes video taking 3 hours of work.

Key learning points

A project champion at senior management level who can promote, raise awareness, lead and advise, sort out difficulties is crucial to the success.

Having a team of enthusiastic, dedicated, knowledgeable and hard-working digital aware staff has contributed significantly to the success of the project. Specifically the Learning Resource Manager, apprentices and experienced elearning mentors have ensured the project achieved its goals.

Governors, managers and leaders have been briefed along the process by various means which has helped with sharing good practice and has become very competitive with off-shoot projects. This is also helping to embed learning technology throughout the college with a view to measuring return on investment and planning for future developments with an eye to funding implications and expectations of students and the use of technology.

The input from a key employer helps the project stay real especially when they can see and hear the impact for their apprentices/employees. This has been an extension of the already outstanding work we do with key employers. Further work with key employers will be undertaken to showcase the materials and develop their own staff competence and confidence using learning technology. By sharing each other's good practice in this area the college and the employers will benefit with improved resources for their staff.

The development of the Engineering team to build their confidence and skills to use learning technology has been hard work for all concerned but very rewarding for them and their students. It was a great achievement to be judged Outstanding by OFSTED and made the hard work worth it.

To avoid or change in the future is video creation of a high standard. Planning here is important and to understand the pitfalls of high quality versus low-tech solutions (see the do's and don't's of creating elearning materials).

The college has been very strategic in planning for the learning technology revolution with infrastructure and key staff in place. The PEO project has been a catalyst for change. However overall college CPD has not suffered but has been strengthened by this project. Key projects and areas of development for 15/16 have already been identified and are in progress. The work doesn't stop here!

Resources

PEO Digital Learning Resources available on http://peo.furness.ac.uk

3 types of files are available (instructions available on the website)

- A download file which is a zip file consisting of the original Articulate Storyline file to customise yourself

- A downloadable activity file for each unit. No source code here, just a stand-alone application which can be run in the browser of your choice.
- Using Moodle? A complete SCORM package that can be uploaded to your VLE for everyone to use.

6 units are available

- Unit 1 – Working safely in an Engineering Environment
- Unit 2 – Working Efficiently and Effectively in Engineering
- Unit 3 – Using and Communicating Technical Information
- Unit 5 – Drilling
- Unit 5 – Marking Out
- Unit 5 – Tapping

Template used by lecturers and development team for creating elearning materials.

Video of Student and staff comments on the PEO project.

Poster/Presentation of the CPD Strategy used for the PEO project.

Do and Don’ts of creating elearning materials and videos.