

Train-For-Life: On-Line Interactive Training for Industry Learners

Bashar BARMADA^a, Nilufar BAGHAEI^a

^a*Department of Computer Science, Unitec Institute of Technology, Auckland, New Zealand*
{[bbarmada](mailto:bbarmada@unitec.ac.nz), [nbaghaei](mailto:nbaghaei@unitec.ac.nz)}@unitec.ac.nz

Abstract: Learning a topic online via Massive Open Online Courses (MOOCs) has gained a lot of popularity due to their scalability and efficiency of knowledge distribution. However, participating in these courses usually means fully committing to the course for at least a few months in some cases. Providing engaging online education is a challenge for industry/non-academic trainees mainly due to their lack of time. In this paper, we describe a practical experience of online learning for non-academic audience in transport, logistics, security and safety industry. The proposed training courses are designed to be short, flexible and interactive to keep the trainees interested and engaged with the content. During any courses the trainees were challenged with different interactive tasks to emphasis on some important points. Results show that more than 90% of the trainees managed to complete the training parts of the courses they are registered to do and enjoyed their experience.

Keywords: online learning, interactive training, non-academic trainees, industry learners

1. Introduction

Training and development is a continuous process in any organization, in order to keep the employees on the top of their working field. With the permanent availability of the Internet, on-line training becomes very popular in offering cost effective learning materials anywhere and anytime [Kim et al., 2014; McCutcheon et al., 2015; Seaton et al., 2014; Gaebel, n.d.; Cisco Networking Academy, n.d.]. It is essential for companies to train different types of staff in transport and logistic industry. The aim is to increase their awareness of how to deal with difficult and emergency situations that will affect their health, safety and the security of the products and organisations, such as Lorry Hijacking, Deception and Rubbery [Burke et al., 2011; Robson et al., 2012; BBC news, ret. 2012; New Zealand Police, ret. 2017].

Academic on-line courses can run for long hours, days and even weeks and usually the learners are enthusiastic to finish the course undertaking to improve their learning curve quickly and efficiently. However, providing engaging online education is a challenge for industry/non-academic trainees mainly due to their lack of time [Aamodt G. M., 2016; Robson et al., 2012; Kizilcec et al., 2013]. Our own experience also shows that some of these learners do not find the lengthy online courses engaging enough and see them as an obstacle to do the real work

We propose Train-For-Life (T4L), an on-line interactive platform training courses targeting industry trainees in transport and logistic area¹. The courses also target admin staff and their daily life, at work or outside work, to make it healthier physically and emotionally (HSE – Health and Safety Execution²). With on-line availability of these courses, drivers, admin staff and others are flexible to take the required training anytime and from any place. All courses are built with the following goals in mind:

- Courses are short (30-50 minutes long), as we are targeting industrial participants, who most of the time find it very difficult to find large gap in their schedule to do training, and who get bored and/or distracted very quickly.

¹ <http://www.trainforlife.co.uk>

² www.hse.gov.uk/index.html

- Courses are interactive. Beside simplicity, the courses are built with many interactive features to engage the participant and improve their perceptions (Harris, n.d.).
- All courses are followed by short tests of multiple choice questions to test the understanding of participants.

The research question we are investigating is given the online nature of these short courses and the audience (non-academic industry trainees), will they be able to complete these courses?

This paper is structured as follows. Section 2 presents the T4L platform and gives a brief description of the available training courses, the areas they cover and the mechanism to follow to create new courses. Section 3 describes the interactive methods used in the training courses. The results are presented in Section 4. We conclude by detailing the future work.

2. Training Courses

2.1 Courses Categories

Train-for-life develops the online training courses according to the following main categories:

- Transport and Logistic: Concentrates on drivers and how to improve their security awareness, for example in case of hijacking and theft.
- Personal Security: Focuses on how to improve the person's own security at work and during everyday life routine, such as scam awareness.
- Security and Protection: Concerns on the safety of individual and the precautions that are needed to be taken, such as manual handling of heavy objects, and robbery response.
- Security Skills: Enhances the skills related to security and various awareness issues, such as conflict and stress management.

2.2 Tests

After finishing the learning part of any course and to ensure that the trainee has absorbed the essential concepts, the trainee needs to take a short test of 20 questions maximum with multiple choice answers to complete the course. To maintain the fairness of the test, the questions are chosen randomly from a large bank of questions. The results are recorded in the management system together with other important information such as the date of the test and start/end time of the test. After finishing the test, the trainee can revise the questions that been answered incorrectly, but they cannot change their results. The trainee can take the test of any course as many times as they want, independent of the learning material, until they reach the passing results.

2.3 Course Creation Mechanism

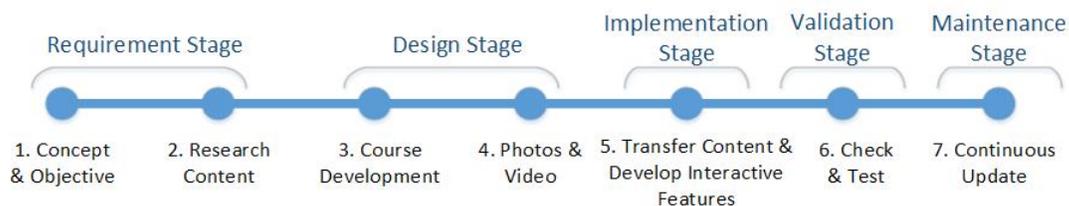


Figure 1. The stages of developing the online training courses.

The creation of the courses goes through several stages as illustrated in Figure 1. The stages are summarized as follows:

2.3.1 Requirement Analysis

Define a clear objective of the course where it gives benefit to the industry and provides training to a large sector of audience, especially if the course targets government concerns and is supported by professional bodies, such as health and safety executive. More thorough research is conducted around the topic and many stakeholders are consulted at this stage to ensure the analysis satisfies the rules and regulation and the content delivers the right information. The interactive parts are also planned to enrich the course and make it more interesting to the type of audience.

2.3.2 Design

The course is divided into several short sections, each section consists of few pages followed by the interactive parts. The content of each page is a mixture of text, images and video, where the text does not occupy more than 33% of the page. Figure 2 shows an example of a used page template. Paragraphs appear sequentially and are synchronized with the images/videos. The reader has the option to hover over any text to view the related image or video. A progress bar indicates to the reader how far they are from finishing the contents of the page.



Figure 2. Example of page template. Example: Conflict Management.

Designing the interactive parts happens at this stage. It involves shooting video clips and taking photos, which are done using professional models, actors and photographer. All video clips and photos are edited then to suit the course under development.

2.3.3 Implementation

Where everything comes together. The course is implemented using PHP, Javascript, and JQuery for the interactive parts, which will be explained below.

2.3.4 Testing and Validation

This includes technical and non-technical verification and validation, and involves customers and different stakeholders for the final acceptance phase.

2.3.5 Maintenance

To ensure that the course is keep fulfilling the requirements of industry and professional bodies, the course is subject to continuous update, especially when feedback starts to come from users.

3. T4L Interactive Methods and Architecture

The interactive features used are what distinguish this online training and make the learning method unique and interesting, compared to other conventional learning methods. After each learning section the trainee will go through some interactive parts to challenge their understanding and reiterate on some important points in the learning material for that section. The trainee can try the right way as well as the wrong way, and with every choice they make a brief explanation appears to comment on their action and the consequences that might happen. It is always advisable that the trainee try all the wrong ways to see the consequences. The used interactive methods are listed below:

- Panoramic training: The trainee can take a tour inside a building or a room, move between buildings / rooms, and click on points of interest to emphasis on some important ideas.
- Drag and Drop: The trainee can drag some objects and drop them in their right or wrong places, or sort objects in a particular order.
- Using arrows: The trainee clicks on different arrows (up/down, front/back, and right/left) to change the value of some parameters and experience the right and wrong ways. Figure 3 gives an example of using arrows from a Manual Handling course.
- Video clips: These are short clips (3 minutes maximum) and they are coupled with text and narrative to explain some important concept in a visual way.
- Quizzes: Come as multiple choice questions or True/False. Again, with every answer the trainee chooses comes an explanation.
- Cyber tutor: is virtual character that is used to comments on the learning material, explain particular points and emphasis on important issues. The cyber tutor can be seen as an alternative way to provide a trainer for the course. The trainee has the option to skip the cyber tutor section is they wish. Figure 4 shows an example of Cyber Tutor from Theft by Deception course.
- Click to activate: The trainee clicks on some points of interest to fire up extra explanation.
- Combination of different interactive features together for larger scenarios.

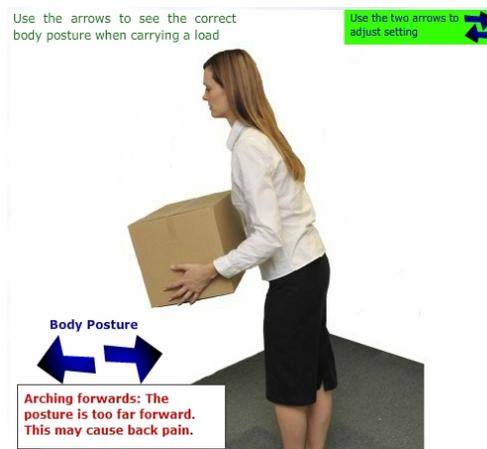


Figure 3. Using arrows to show the right / wrong ways of carrying a load. Manual Handling Course.



Figure 4. Using Cyber Tutor to provide extra explanation and emphasis on some important points. Theft by Deception course.

4. Evaluation Study

We conducted an evaluation study in 2016-2017 with employees of three large companies in the UK, aged between 21-69 years old. The sample size recruited was: Company A: 333, Company B: 597 and Company C: 126. The company names are anonymised in the interest of discretion. Taking into consideration the type of the audience, the courses were designed to be short and interactive. The estimated time to finish the training part for the courses, including the interactive sections, was between 30 minutes to 50 minutes. Once a course became longer than 60 minutes, the chances of a trainee completing the course was reduced. For these training courses, the training part was independent from the test, and a trainee could take the test any time once they logged in. Figure 5 shows the average time taken to finish the training part by trainees for some of the courses. It is between 35 minutes, for Display Screen Equipment (DSE) course, and 45 minutes for Hijacking course.

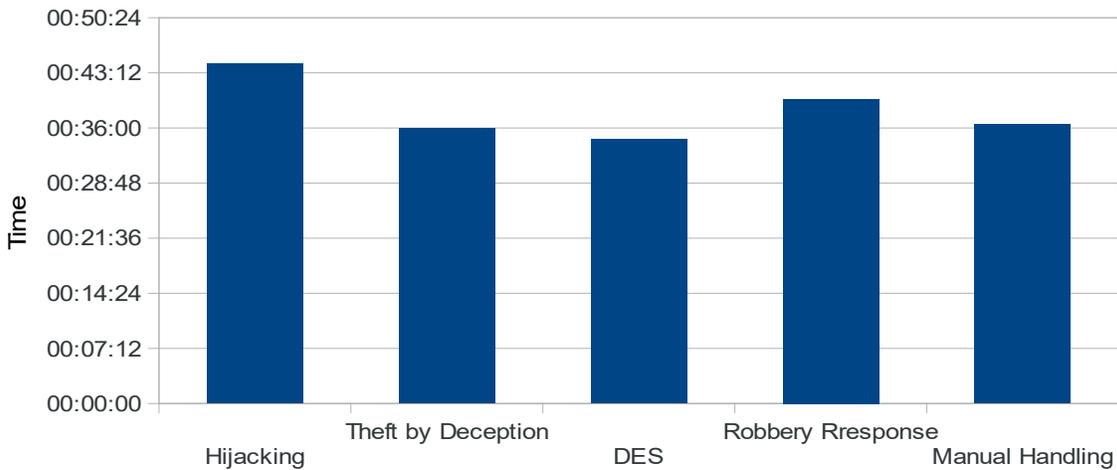


Figure 5. Average Time of finishing the training part for some courses.

To address our research question, we also logged the progress percentage as part of studying the performance of the trainees. Companies tended to concentrate on few courses that were of important to them, and asked their employees to do those particular courses. Figure 6 shows the progress of finishing the training parts by the employees, where 100% means the employee finished the training part, 25% the employee went through only 25% of the training material, and so on. As it can be seen, more than 90% of the employees completely finished the training parts for the courses of their interest. We also conducted a subjective evaluation, results of which showed that the participants enjoyed interacting with the portal and 80% strongly agreed that it was user friendly.

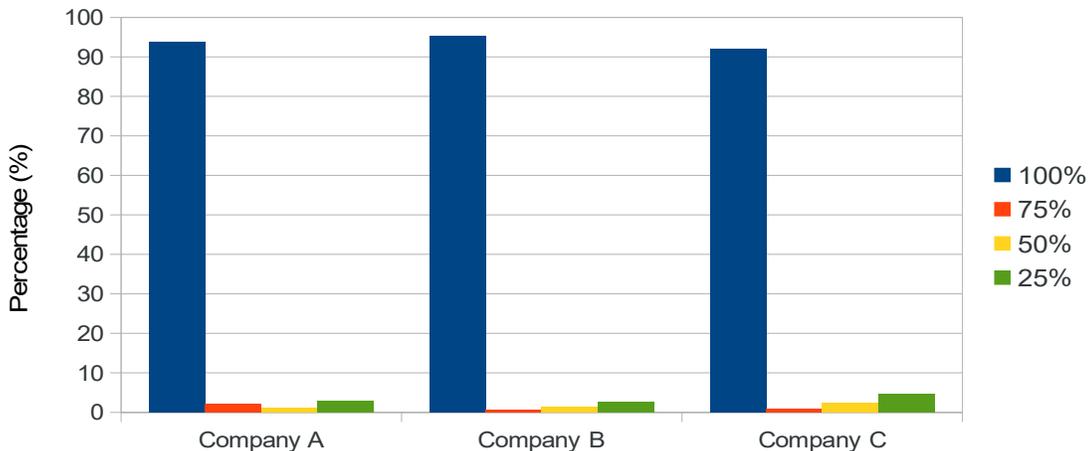


Figure 6. Course progress of finishing the training part for three companies A, B and C.

5. Conclusion

In this paper, we presented T4L an interactive platform for offering training to industrial non-academic audience. The interactive methods used with these courses include drag and drop, using arrow buttons to change positions, short video clips, cyber tutor, and clickable points of interest. Using these interactive methods, a trainee has the chance to view the correct way and the incorrect way to perform tasks with short explanation of any chosen action.

Results of our evaluation study show that the average completion time of trainees was within this time range. In monitoring the performance of trainees, it was shown that more than 90% of the trainees completed the training part of the courses of their interest. As part of future work, we will further analyse the subjective evaluation questionnaire to find out what participants thought about different features of the portal. We will also look at personalising the content and presenting it based on user preferences and their interaction with the website.

6. References

- Cisco Networking Academy. <https://www.netacad.com/>, Retrieved April 2017
- ISO/IEC 24751-1 (2008). Information technology — Individualized adaptability and accessibility in e-learning, education and training. Part 1: Framework and reference model,
- BBC News article, *West Midlands lorry hijackers targeted by police*, <http://www.bbc.com/news/uk-england-20184903>, updated July 2012
- New Zealand Police article, *Bank robbery ANZ Bank, Glenfield, New Zealand Police*. <http://www.police.govt.nz/news/release/bank-robbery-anz-bank-glenfield>, updated May 2017
- Aamodt G. M. (2016). *Industrial/Organizational Psychology: An Applied Approach*. 8th edition, Cengage Learning.
- Harris. P. (n.d.) *Non-Traditional Teaching & Learning Strategies*. Faculty Excellence at MSU | Montana State University, <http://www.montana.edu/facultyexcellence/Papers/activelearn2.html>, Retrieved April, 2017
- Kizilcec, R., Piech, C., Schneider, E. (2013) *Deconstructing Disengagement: Analyzing Learner Subpopulations in Massive Open Online Courses*. Proc of the Third International Conference on Learning Analytics and Knowledge (LAK), Leuven, Belgium, April, 2013, pp. 170-179.
- Gaebel, M., *MOOCs – Massive Open Online Courses*, http://supporthere.org/sites/default/files/eua_occasional_papers_moocs_4.pdf, Retrieved March 2017
- Kim, C.M., Park, S.W., Cozart, J. (2014) *Affective and motivational factors of learning in online mathematics courses*. British Journal of Educational Technology. 45 (1), pp. 171–185.
- Karen McCutcheon, K., Lohan, M., Traynor, M., Martin, D. (2015) *A systematic review evaluating the impact of online or blended learning vs. face-to-face learning of clinical skills in undergraduate nurse education*. Journal of Advanced Nursing. 71 (2), pp. 255–270.
- Seaton, D., Bergner, Y., Chuang, I., Mitros, P., Pritchard, D. (2014) *Who does what in a massive open online course?* Communications of the ACM. 57 (4), pp. 58–65.
- Burke, M.J., Salvador, R.O., Smith-Crowe, K., Chan-Serafin, S., Smith, A., Sonesh, S. (2011) *The dread factor: How hazards and safety training influence learning and performance*. Journal of Applied Psychology. 96(1), pp. 46–70.
- Robson, L., Stephenson, C., Schulte, P., Amick III, B., Irvin, E., Eggerth, D., Chan, S., Bielecky, A., Wang, A., Heidotting, T., Peters, R., Clarke, J., Cullen, K., Rotunda C., Grubb, P. (2012) *A systematic review of the effectiveness of occupational health and safety training*. Scandinavian Journal of Work, Environment & Health. 38 (3), pp. 193–208.