

## **Paper**

# **An E-Learning Tutorial for Vocational E-Literacy**

Dr Amanda C. Elliott and Ruth A Hunn  
Cranfield University, DCMT

## **Abstract**

This paper reports the key elements of the initial phases of an e-learning project to develop a tailored e-literacy tutorial for vocational students of Cranfield University, studying both on and off campus. The research phase of the project comprised reviews of the existing literature and online information literacy tutorials and a benchmarking exercise. This aimed to establish current best practice and previous lessons learnt to avoid common problems and re-invention. The findings were subsequently used to guide the specification phase, which was used to inform the whole team of the project's objectives. The specification phase produced a target audience description and identified the user acceptance risks and user requirements. The outputs of these are described in-depth in this paper. The key issues identified during the initial phases that will affect our design and development were: the need to understand the target audience; recognise what might stop someone using the tutorial; design to meet the users' needs and identify a technical solution that fits.

## **Keywords**

e-Literacy, Information literacy, User acceptance risks, Vocational learning

## **1. Introduction**

For many years information skills training has been offered to the students studying at Cranfield University, the Defence College of Management and Technology (DCMT), previously the Royal Military College of Science (RMCS). This training has predominantly been offered at the beginning of their first year or first semester of study and is not compulsory. Traditionally, information skills training has been delivered by subject librarians. Recently, there has been a need to supplement this training with more regular reminder sessions as more and more students are now realising the importance of the library to aid them in writing essays and their final dissertations.

The armed forces are currently reviewing the delivery of officer training. A move to distance learning, instead of sending the student to study full time at an institution, is becoming the preferred method. With the increase in those studying away from a campus, the students will have less instruction on how to find information to help supplement their studies. Distance learning students will not be attending the institution and will not be able to visit the library and receive instruction on how to find information for their studies. Therefore, it is possible that students studying on these courses will be disadvantaged, as they do not have direct access to a librarian to help them when they are researching a topic for study or application.

Cranfield University, DCMT provides e-learning courses to the military and the Information Services Department saw it as an obligation to provide information skills to those studying on these distance courses. The institution is currently in the process of developing an online information literacy tutorial that will be used by students registered on courses at Cranfield University, DCMT. The e-learning information literacy tutorial is being developed with the aim of enabling the students to learn the relevant application of identifying, locating and using information effectively. The tutorial is directed at vocational learners who are studying at Officer level. The e-literacy tutorial will be designed to sit alongside a specific suite of military programmes that Cranfield University has been involved in producing.

## **2. Tutorial development**

The tutorial is being produced following the general project development phases of research, specification, design, build and test. Of particular interest, is the amount of time devoted to the research and specification phases; the department views it as essential that the product is not developed without a full understanding of what the tutorial must achieve, who will use it and whether there are best practices that should be followed. Here we provide a commentary on the key issues arising from the two former phases of the project, which are now complete.

## 2.1 Research phase

The research phase consisted of a literature search and review, a practical review of online information literacy tutorials and a benchmarking exercise.

A literature search was carried out to locate information on the association of information literacy with e-learning, transferable skills, lifelong learning, blended learning, distance learning and independent learning. The literature review looked in-depth at the most recent articles (2003 onwards) to determine the current understanding and direction on information literacy and, in particular, the learning of information literacy skills.

Our review of online information literacy tutorials was carried out by firstly attaining an overview of the general status of tutorials, followed by the selection of 30 tutorials from around the English speaking World, for an in-depth review. Aspects of the tutorials assessed included the number of modules, the inclusion of self assessment, what learning styles the tutorials catered for, and how accessible the tutorial was for a student to use. The review sought to provide us with information that would help us understand how others were providing learning material and whether they met our aim:

*“to enable the student to learn the relevant practical application of (identifying, locating and) using information effectively”.*

Our review looked at:

- How tutorials *enable the student*;
- How tutorials help the student *learn*;
- How relevant the tutorial is in terms of relevant *practical application*;
- How tutorials incorporate *using information*;
- How *effective* the tutorial was for the learner.

The review resulted in conclusions and recommendations, which were then documented for use in the specification phase (Hunn & Elliott, 2005).

The review provided us with our own representation of current tutorials and their use, however, it did not give us insight into best practice or lessons learnt from the developer’s point-of-view. Therefore, following our review, we also undertook a survey and benchmarking exercise. The survey was provided online and ten institutions were invited to take part, with eight accepting. The benchmarking study used personal visits to selected libraries in the UK, who were willing to take time to explain their tutorial and its development to us. Four such visits took place, which provided a great deal of rich information. Both the survey and the benchmarking sought to gain a better comprehension of:

- Design, development and user feedback;
- Pedagogical credibility;
- Content;
- Interactivity;
- Look and feel.

As with the initial review, findings from this work were then analysed and used to assist the specification phase (Hunn, Elliott & Town, 2005).

## **2.2 Specification phase**

Our specification phase built upon the solid foundations of our understandings developed during the research phase. In particular, it was important for us to ensure that the whole team (which contains many non-librarians) understand what we are aiming to achieve. In order to help with this process, the project developed three key documents:

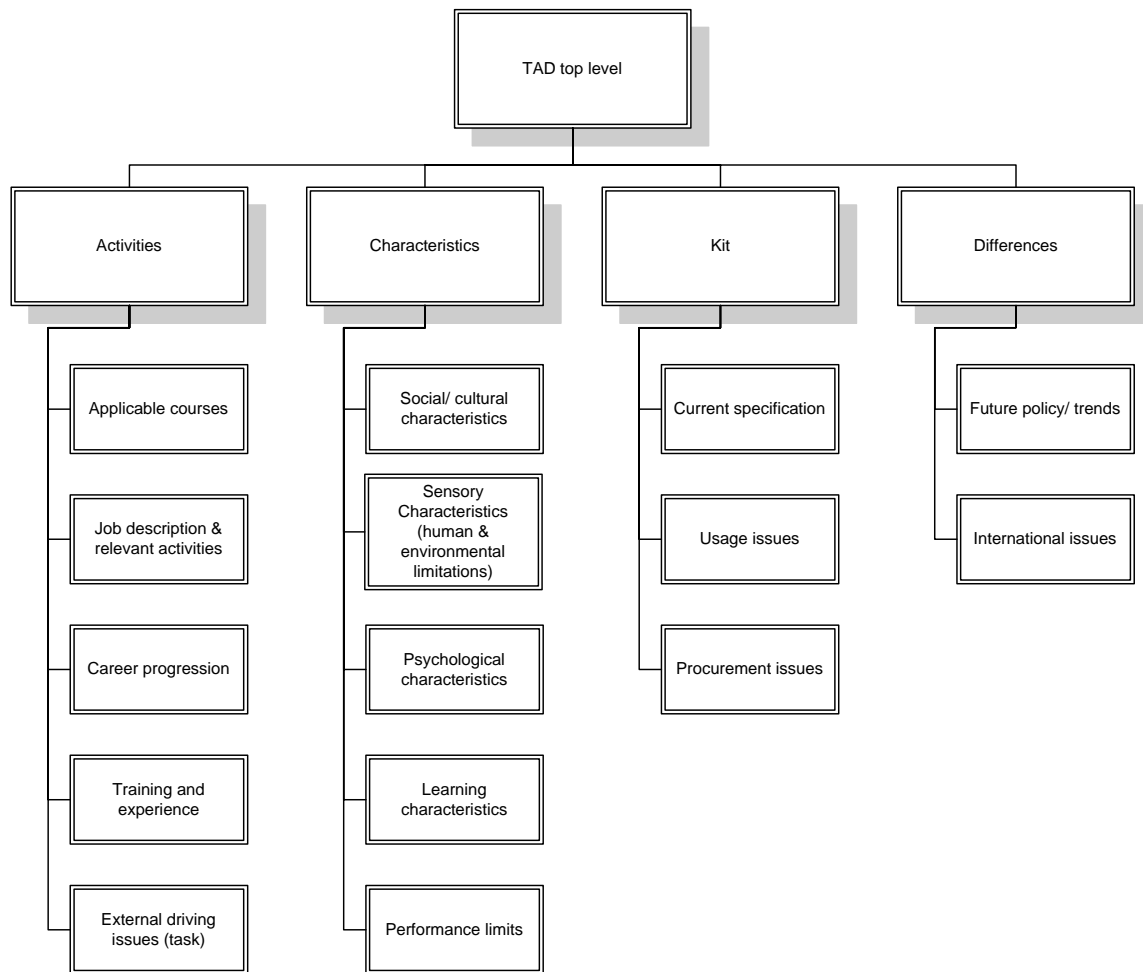
- Target Audience Description (TAD);
- User Acceptance Risks; and
- User Requirements.

### **Target Audience Description**

A Target Audience Description (TAD) was written to enable us to understand who we are developing the tutorial for. Firstly, we identified all potential users of the tutorial and sketched separate TADs for each of these. Then, we established our primary, secondary and tertiary user groups and produced more in-depth TADs for each of these.

We used a tree diagramming technique to document each user group, as it was a clear and convenient method for collecting and disseminating information. Figure 1 provides an overview of the categories that we used to ensure depth and breadth of target audience understanding for our tutorial. The wider team was involved in the development of the TAD, with experience and knowledge drawn in, to provide the most complete picture of our potential users. In addition, meetings with key informants were used to both provide information and to check our assumptions and interpretation.

The TAD is used to disseminate information throughout the development team and it is important to maintain it and keep it up to date throughout the life of the project. The TAD also helps put specific user requirements into context and identify the traits of the target audience that may affect whether or not they accept the product.



**Figure 1. Generic Target Audience Description items**

## User Acceptance Risks

Having determined who the users of the tutorial will be, we sought understand all of the risks associated with user acceptance. The intention is that all of those the primary target audience will be able to use the tutorial and then that all practicable means should be taken to help the members of the identified secondary and tertiary target audiences. However, there are lots of reasons why users do not use a product. The aim of the exercise of identifying user acceptance risks is to recognise what can go wrong before it does. The user requirements and guidelines can then be developed by the team to guard against problems and reduce the risk of the tutorial not being accepted. We used information obtained during the TAD work to provide input to this exercise. Additionally, a major input to this work was from the research phase; our understanding gained during the benchmarking and survey activities.

In general, the possible user acceptance risks are that the user *can't* or *won't* use the tutorial. For this analysis, the “won't” aspects have been further broken down. Thus a set of possible User acceptance risks are:

- The User *can't* use the tutorial
- The User *won't start* using the tutorial
- The User *won't continue* to use the tutorial
- The User *won't re-use* the tutorial
- The User *won't finish/* complete or use the entire tutorial.

We found that a good way of capturing the elements that contributed to the possibility of these events was to draw mind maps. Within these mind maps we recognised four key reasons for the risk: general human; cognitive; general (other) human; time-related; and technical (see Figure 2).

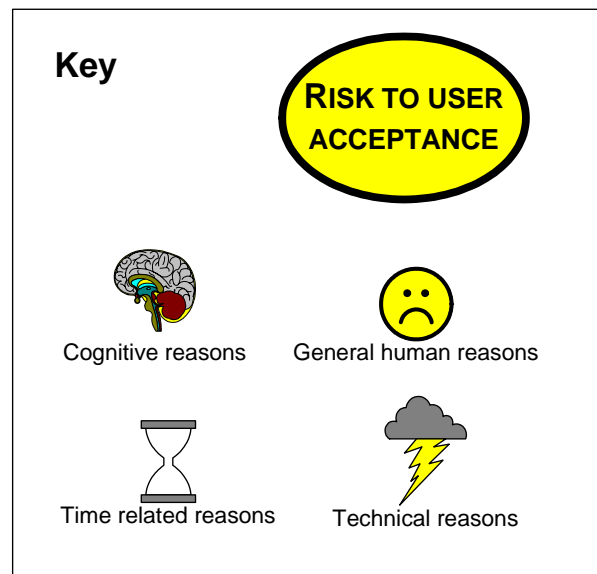
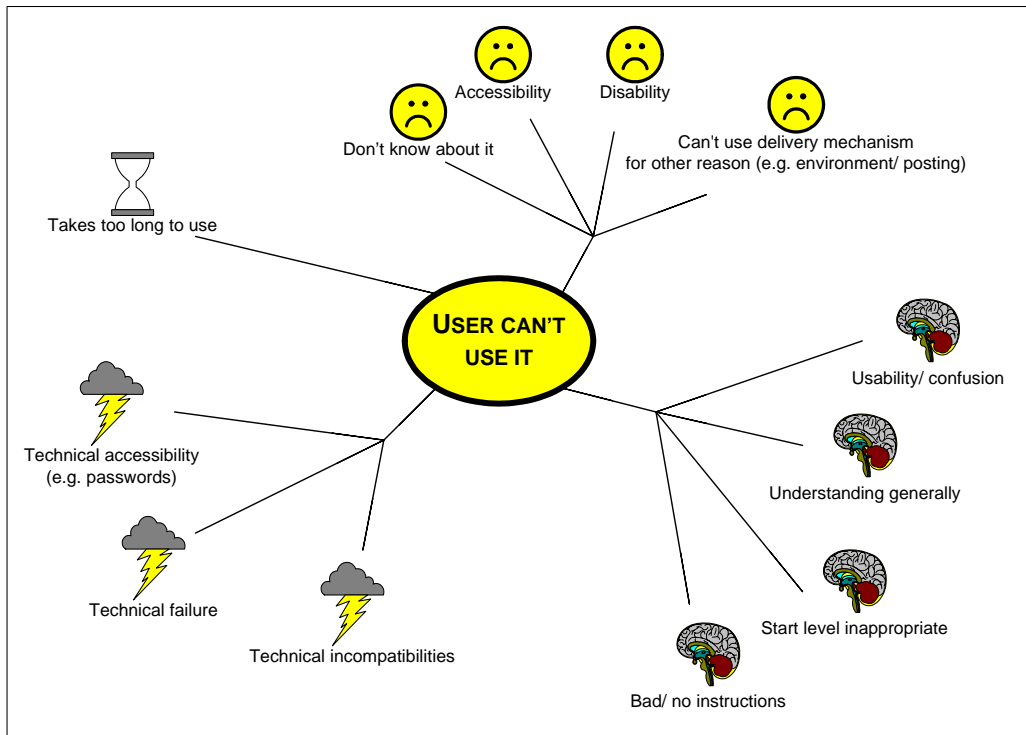


Figure 2. Key reasons for user not accepting the product.

The mind-maps of user acceptance risks considered many issues in detail. However, the issues are generic no matter what type of product you are producing. As such, members of the development team can understand the issues, even though some of them do not come from a user-related grounding. Figure 3 through to Figure 7 show the culmination of inputs from the research phases of the work and our previous experience of risks to user acceptance. The figures show diagrammatically the possible reasons for user rejection, which were considered as important to this project. Though specific to an IL tutorial, for our purposes, the mind-maps provided in this paper are a good starting point for many products and their use and development should be encouraged.



**Figure 3. Possible reasons why users can't use the tutorial**

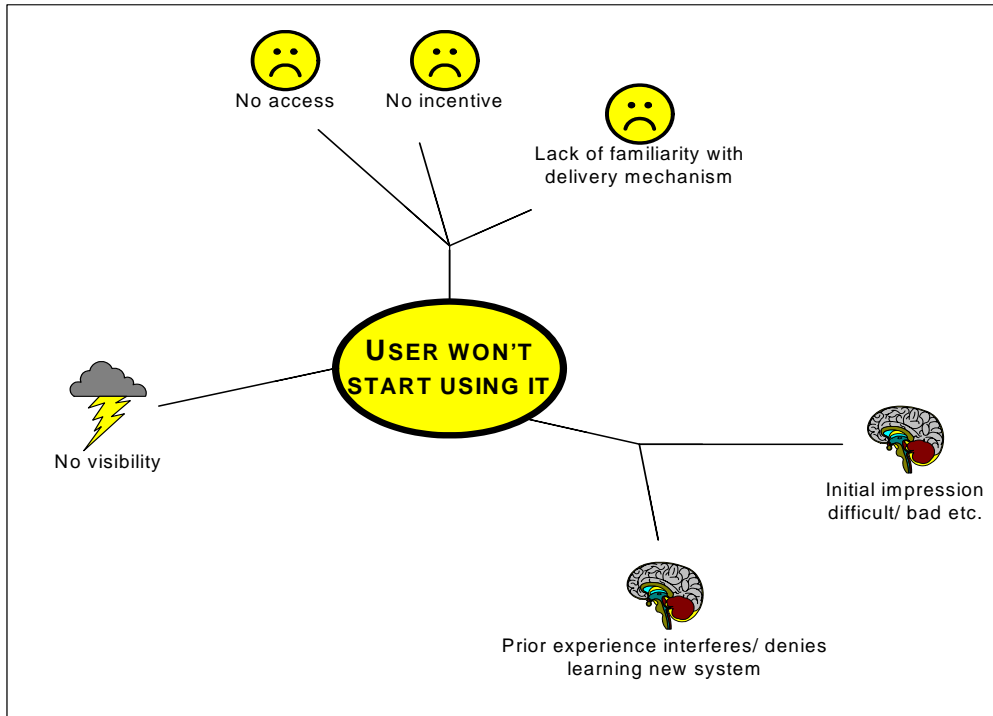


Figure 4. Why users won't start to use the tutorial

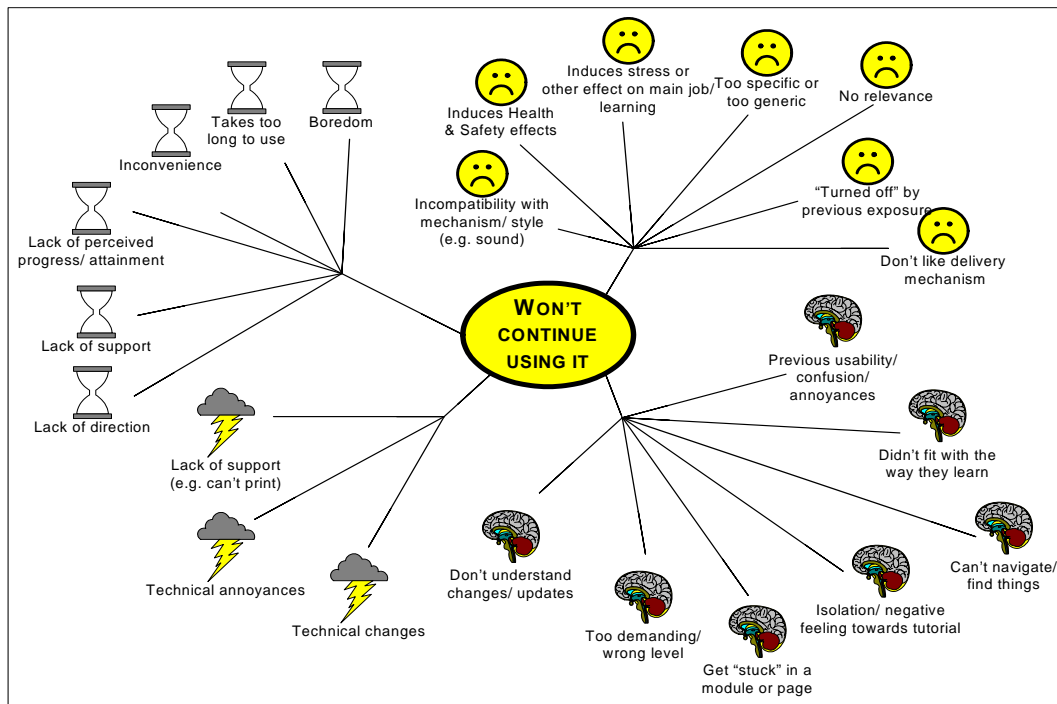


Figure 5. Why the users won't continue the tutorial

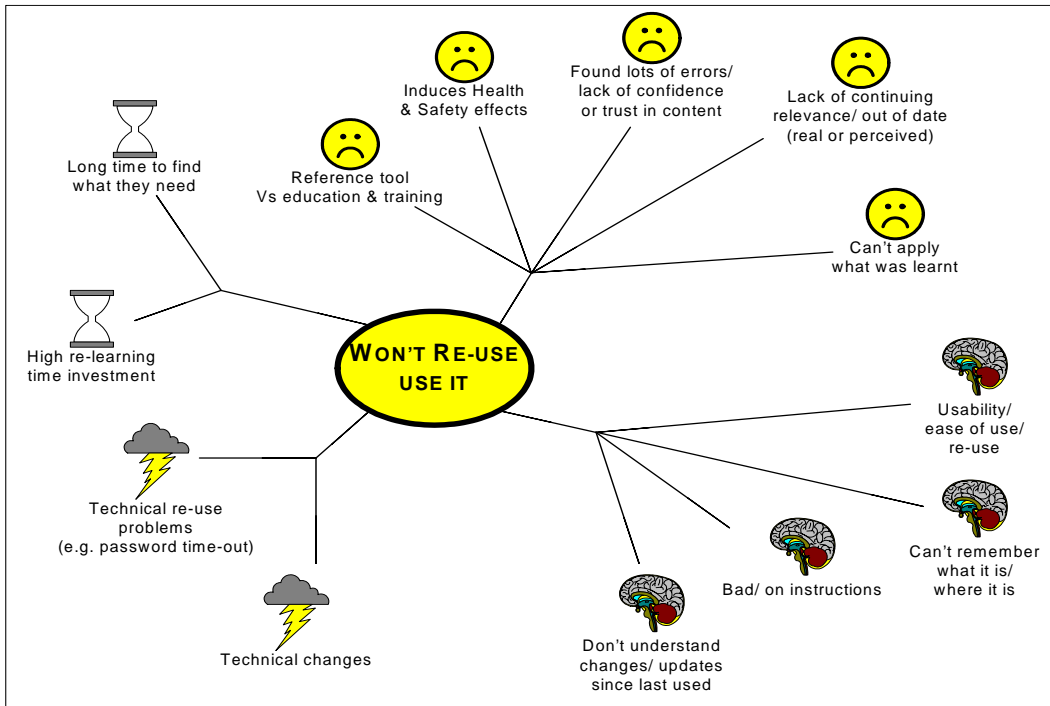


Figure 6. Why users won't re-use the tutorial

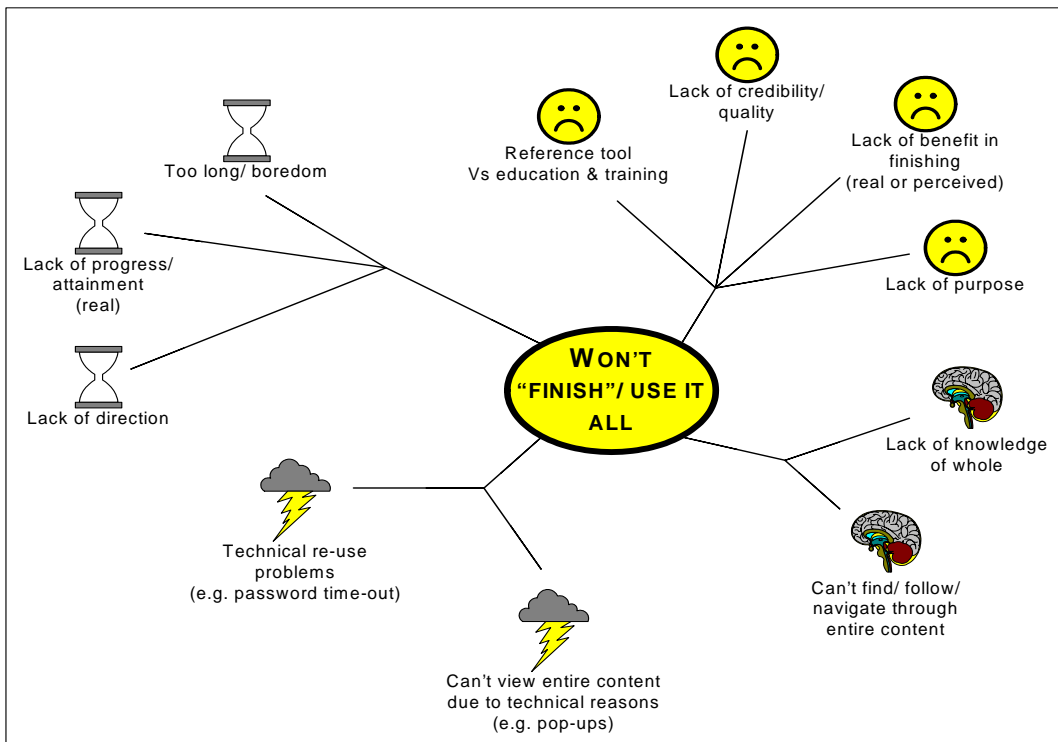


Figure 7. Why users won't complete all of the tutorial

## **User requirements**

Many development projects start from a set of standard, more often than not, technical items. However, our user requirements were developed starting from the research conclusions. The rationale for using the research conclusions was to ensure that the requirements captured the aim of the product and, in particular, any current issues, lessons learnt and best practice. Thus, our user requirements focused upon:

- Overview and conceptual level requirements (top level aims and intent);
- Content requirements (generality of content, application, relationship with other courses);
- Requirements related to characteristics & differences of users (background, learning styles, international issues, disabilities);
- Tutorial direction and learning outcomes (purpose, description);
- Equipment and technical requirements (accessibility, constraints, specifications);
- “Look & Feel” and navigational requirements (scrolling, navigation to/ from/ between/ within, design);
- Assessment (design, placement, marking);
- User support (communication, instruction).

### **3. Discussion**

As the development phase starts for this project, it has been important to reflect upon the value and influence of undertaking such detailed research and specification phases. Developing an e-learning package encompassing an e-literacy tutorial for vocational learners presents many challenges in terms of content, technical application and especially meeting the needs of users.

The content of the tutorial is foremost in the consciousness of the librarians who will be part of the delivery team. The particular issue is how much content to include on each are of literacy; where to draw the line. The tutorial must provide the right content, such that it is useful, pertinent and engages the user. An understanding of “useful”, “pertinent” and “engaging” has come from looking at how other institutions have offered ways to ensure these happen and from reviewing the issues if they are not attained (user acceptance risks). The user requirements capture the issues for the entire team to review, even though they have not had the benefit of carrying out the benchmarking or assessing other products themselves. It is likely that we shall consider the re-use of material from accommodating donors, so that we can concentrate in areas where less content is currently available for vocational users, for example the latter elements of information literacy such as organising results, communication of findings and building upon knowledge.

Technically, the Information Services Department at Cranfield University, DCMT, is well equipped in terms of both technology and knowledgeable staff. However, the challenge is in utilising our experience effectively to ensure that the product can be

delivered to the entire potential target audience. Being military, Officers may be posted around the World and the possibility of using a dial-up connection is high. Additionally, the specification of software cannot be guaranteed. These issues associated with uncertainty of how (and if) the product will be received are well-known to those who develop e-learning for this type of vocational audience. These uncertainties may instigate the risks that the user can't use the tutorial or won't use it due to technical difficulties and time-related issues. However, we do not wish to remove the potential of self-assessments, interactive elements, online database searching or photos and diagrams because other acceptance risks of boredom and the possibility that users will not continue or re-use the product. Our challenge is thus the judicious use of technical solutions. The answer, however, does not lie with the technical experts. Rather, librarians and instructional designs need to understand of the user and their requirements in order to utilise design appropriately. For us, the thorough analysis of what has failed and succeeded in other establishments and sight of in-use delivery mechanisms has made a difference to our intended approach for this project.

Meeting the needs of users requires us to know who these users are and what needs they have before we stand a chance of being able to fulfil their wishes. As explained above, the TAD, user acceptance risks and user requirements have all played fundamental parts in directing our input for this tutorial. However, the challenge remains during the development process of tracking and updating our understanding and communicating it with the development team. Librarians interact with users everyday and modify their responses to accommodate different requests. However, our challenge is that a package used by vocational, distance-learners based far away from a library cannot be as flexible as the librarian. One of our methods of becoming more responsive, is to provide content in a fashion such that certain elements can be updated to reflect changes in the expected direction of user requests and needs. Here we have reciprocation between user needs and technology; as understanding users helps us make sure we use technology effectively, technology can help us meet user needs. The HIVE learning content management system is being used for developing and maintaining our content of other e-learning packages. The benefits have become apparent, specifically in the area of updating elements used within lessons when they have become out of date, or learner feedback has determined change. Depending upon the efficient management of the system and learning elements, updates only need to occur to an individual element and the system will identify where it is used and update it automatically, reconfiguring files and the like to ensure the learner views the content identified for them. The content will be designed such that specific context-related elements are identifiable by the system as being different to the generic content that contains principles.

A further challenge is that of meeting the specific needs of users as individuals; their learning styles and any impairments that affect learning. The benchmarking exercise and surveys identified a general weakness in this area. Therefore, there is less best practice in this area than many others. Indeed, few tutorials appeared to cater for differences and respondents explained that they did not have the resource to cater for differences or that they did not consider it an issues (Hunn, Elliott & Town, 2005). We do wish to provide for differences, as our target audience is known to have these needs. We have specified

this intention in our requirement specification. However, more direction is needed, as specification cannot offer the solution. For our purposes, the development team will be working from guidelines in order to develop appropriate material. Guidelines are being developed not only for writing styles but on how to write inclusively for different types of learners and we have the major benefit of having resident instructional designers who are highly experienced to catering for different needs. Additionally, there are guidelines both for authors and technical developers in order to provide assistance to those with disabilities or impairments that might cause problems during the learning experience, e.g. how to provide inclusive design for those with dyslexia. All the time, the guidance will be pertinent to our target audience, thus ensuring that we are concentrating on the elements most likely to affect user acceptance.

#### **4. Conclusions**

E-literacy is a large area of discipline and our endeavour to develop an e-learning tutorial for vocational for e-literacy has required us to consider in-depth what we are developing, why and for whom. We have determined through a process of thorough research and specification that there are four main areas that will affect our design and development activity:

***Understanding of the target audience*** – without this the tutorial may not fit their needs on diverse issues such as what they want to achieve, ability, career path, equipment available and changes to that may affect their further use of the product.

***Recognising what might stop someone using the tutorial*** – the activity of producing mind-maps of user acceptance risks has helped us focus on what we need to do well in the development.

***Designing to meet the user needs*** – rather than starting from a technical specification, a user requirements specification is focusing the team on the concept, content and learning outcomes as well as the equipment and technical issues.

***Identify a technical solution that fits*** – the expectation of changing content in the future has been accepted and this concept can be supported by our selected learning content management system.

The next phase of work is to embark on our process for content definition. This will use learning outcomes to determine the appropriate direction in terms of tutorial structure, planning and writing of the learning material. The key element for the project is to ensure that all of the research work is not lost but used, enhanced and updated as the project progresses, ensuring that the user needs of our target audience are met and the tutorial accepted for use when it is launched in a year's time.

## 5. References

Hunn, R.A. & Elliott, A.C. (2005). "A practical review of online information literacy tutorials". *LILAC 2005*. Imperial College London, United Kingdom. 4th - 6th April 2005. [Online] [http://www.cilip.org.uk/groups/csg/csg\\_ilg/poster\\_files/Ruth\\_Hunn.pdf](http://www.cilip.org.uk/groups/csg/csg_ilg/poster_files/Ruth_Hunn.pdf) [Accessed: 27/07/2005]

Hunn, R.A., Elliott, A.C. & Town, J.S. (2005). "Benchmarking of online information literacy tutorials to identify lessons learnt and best practice". Paper presented at: *6th Northumbria International Conference on Performance Measures in Libraries and Information Services*. Durham, England. 22 - 25 August 2005. (Awaiting publication)

### Address for Correspondence

Ruth A. Hunn  
Library  
Defence College of Management and Technology (Cranfield University)  
Shrivenham  
Swindon  
SN6 7ND

01793 785112

r.a.hunn@cranfield.ac.uk