# THE CHALLENGE OF E-LEARNING

## Introduction

I was recently asked to review an e-learning product produced by a major organisation. It used video, graphics and animation and cost tens of thousands of pounds to produce. Its designers and promoters were keen to emphasise its use of up-to-date technology. It was relatively entertaining. However, it had little to do with learning. The designers had missed the point completely. The objectives and process of learning had disappeared beneath a host of technologies.

## Learning objectives

E-learning products have to recognise the learning objectives that they have been developed to fulfil. The most commonly referenced framework is the one developed by Bloom (1956). He proposed three domains:

- Cognitive: thought or knowledge: "what the student is able to do"
- Affective: feelings or choices: "how the student chooses to act"
- Psychomotor: physical skills "what the student can perform"

Most professional testing takes place within the cognitive domain where Bloom suggested six levels. These levels are shown below

| Level | Cognitive Skills demonstrated | Typical verbs use in questions |
|---|---|---|
| Knowledge | Recall information; knowledge of facts, events, places etc. | Define, List, State, Identify, Record |
| Comprehension | Grasp meaning | Discuss, Describe, Recognise, Review, Explain |
| Application | Apply methods and theories to new situations | Apply, Interpret, Use, Solve, Demonstrate |
| Analysis | Identify patterns, recognise components and their relationships | Distinguish, Analyse, Appraise, Compare, Contrast |
| Synthesis | Generalise from given knowledge, relate knowledge from different sources, draw conclusions, predict | Propose, Design, Construct, Prepare, Assemble |
| Evaluation | Make judgements, evaluate data, compare and contrast ideas | Appraise, Evaluate, Assess, Choose, Revise |

The structure of the e-learning should reflect the objectives of the testing. For example, if the questions are primarily about the recall of knowledge, then learning aimed at developing a student's analysis skills is largely irrelevant. The opposite is also true. At higher level examining, many examiners are frustrated by candidates inability to apply the knowledge that they learnt. They can list Porter's five forces but not apply them. It should also not be assumed that knowledge is somehow cumulative. Candidates with good analysis skills may

be unable to pass knowledge-based examinations. I have met experienced, effective software testers who are unable to pass the ISEB/ISTQB Foundation in Software Testing because they cannot recall information or define the meaning of specific terms.

## Learning styles

It has long been recognised that people learn in different ways. The articulation of these different styles is largely attributed to David Kolb (1983). The learning style itself is the product of two pairs of variables. One defines the processing continuum (how we approach a task) and the other (the perception continuum), concerns how we think or feel about it; our emotional response. When we approach a new learning situation we decide whether we wish to do or watch (processing) and at the same time we decide whether we wish to think or feel (perception). Although we have a preferred style, it is unlikely that we will apply it to every situation. For example, it might be affected by the way we will be tested. It might also be affected by previous knowledge. If we are already confident about a knowledge area we might jump straight in and do (active experimentation). In other circumstances we might take a more reflective approach; watching others involved in the experience and thinking about what is happening, before trying it ourselves.

Kolb defined four learning styles based on the four parts of the matrix defined by the processing continuum (vertical axis) and the perception continuum (the horizontal axis). These styles are given below.

|  | Doing (active experimentation) | Watching (reflective observation |
|---|---|---|
| **Feeling (concrete experience)** | Accommodating | Diverging |
| **Thinking (abstract conceptualisation)** | Converging | Assimilating |

Very briefly:
The 'accommodating' learning style is 'hands-on', employing a practical, experiential approach. Learners with a 'diverging' learning style prefer to watch rather than do. They gather information and use imagination to solve problems. People with a 'converging' learning style prefer technical tasks and practical problems. Finally, the 'assimilating' learning preference is for a concise, logical approach. These people require clear explanations, rather than practical opportunities. Evidence suggests that most people have a clear preference for one learning style and switching between styles may not come easily to them.

The learning styles of Honey and Mumford are also well known. There are similarities with the Kolb model and these have been recognised by the authors themselves who suggested that "the similarities between his (Kolb) model and ours are greater than the differences". Honey and Mumford define four styles and stages in learning. The first stage is having an experience and is associated with **activists.** Activists are 'hands-on' learners and prefer to have a go and learn through trial and error. The second stage concerns reviewing the experience and is associated with **reflectors.** Reflectors are 'tell me' learners and prefer to be thoroughly briefed before proceeding. The third stage is concluding from the experience, associated with a term they called **theorists.** Theorists are 'convince me' learners and want reassurance that something makes sense.Finally, comes planning the next steps and the style of **pragmatists.** Pragmatists are 'show me' learners and want a demonstration from an acknowledged expert.

## Implications for learning

Successfully engaging participants with different learning styles has long been a problem for 'face-to-face' training. Too much training only uses one style, often the preferred learning style of the trainer! Unthinking reliance on group work is particularly problematic, as different learning styles engage differently in such work. Some embrace it, some want to lead it and others feel that it is a waste of their time and are unwilling or unable to participate. Unless the objective of the learning is group work itself, then group work favours certain learning styles at the expense of others. The nature of the assessment also has to be considered. The group production of a certain technical model is not necessarily good preparation for an individual attempting an examination where they will have to demonstrate skills of analysis and synthesis using this model.

E-Learning opens up the opportunity of allowing learners to participate in different ways. E-learning should allow different routes for learning, at the same time bearing in mind how that learning will be assessed.

For example, people who prefer the 'assimilating' learning style will not be comfortable if they are thrown into a learning situation without notes and guidance. Thus the e-learning solution should have a route where learners can read notes, listen to lectures and reveal the answers to practice questions. Similarly, people with an 'accommodating' learning style will become frustrated if they are forced to read lots of instructions and listen to presentations. The e-learning product should allow them to gain 'hands on' experience immediately.

The issue for e-learning designers is not the exploitation of as many technological variations as possible, but the provision of solutions that accommodate different learning styles and recognise how that learning will be assessed.

## Design of the e-learning product: Foundation in Business Analysis

The author has recently been involved in the production of an e-learning product for the ISEB Foundation in Business Analysis. There were several technical constraints that had to be taken into consideration, both in terms of the authoring product and in the technology available to potential customers. For example, it could not be assumed that the customer had a high specification computers or broadband technology.

The Foundation course itself is a wide-ranging course, based on a British Computer Society publication. It is assessed through multiple-choice questions and is primarily concerned with (in Kolb's terms) knowledge and comprehension, with a few questions requiring application. It was also felt, by the design team, that many people taking this qualification would have a reasonable amount of existing knowledge about the subject. Consequently, there would be areas that they were relatively comfortable with (such as investigation techniques) and others which were less familiar (such as strategy analysis). These factors were taken into account in the design of the product. The examination itself is available through computer-based assessment and hence is available worldwide.

To accommodate different learning styles, it is possible for the learner to just 'get stuck in' and to use the product to test themselves. This is through both 'reveal' questions (where the answer is revealed once they have attempted it) and through assessed questions which are scored and stored in the learning management system. Learners who want a more reflective approach can work through the course material at their own speed, with the opportunity to test themselves after every subject heading in the module, or to delay that test until the end of

the module. Again, these are 'reveal' type tests which form part of the learning process. A further option is now being added for the learner to learn at the pace of an acknowledged expert providing a lecturing commentary to the notes. The comprehensive course documentation is available in Powerpoint-type slides, as well as in comprehensive narrative handouts. Thus the reflective learner again has a variety of styles to choose from.

There is also the facility sit a complete mock examination prior to attempting the real examination.

Early experience of the product suggests that learners are using it in many different ways. Some have worked progressively through the course material; whilst others have concentrated only on the comprehensive question set. Whichever way it has been used we are pleased with the initial outcomes. The pass rate is currently 100%, compared with a global pass rate of 59%.

## Conclusion

There is concern that e-learning products will be seduced by style and image, at the expense of effective learning. Effective learning needs to take into account at least four issues. These issues are the likely prior knowledge of the learner, the preferred learning style of the learner, how learning will be assessed and the technology available to the learner.

The ability to adapt to different learning styles should be one of the key benefits of e-learning. This flexibility is very difficult to address in face-to-face learning. This is the real challenge of e-learning, not to provide vacuous entertainment or exploit technological opportunities for their own sake.

## References

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- Honey P and Mumford A *Learning Styles Helper's Guide,* Peter Honey Publications, 2006

- Kolb D *Experiential Learning: Experience as the Source of Learning and Development*, Prentice Hall, 1983

Also see Peter Honey's web site: www.peterhoney.com

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