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AUTHOR Lockitt, Bill
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ABSTRACT

This document is intended to help British further education (FE) practitioners, managers, and governors develop a strategic approach to integrating information and learning technology (ILT) within flexible and open learning environments based on an understanding of learning styles. The following topics are discussed in the document's three chapters: understanding learning styles (the need to put learning into context, eight critical questions that should be asked when attempting to achieve an integrated model of education and work-based training; and the theories of Honey and Mumford, and Kolb); unlocking the potential of ILT within the context of what learners already know (the nature of learning; individual learners; development of Kolb's "learning by doing" model, and effective communication); and matching learning styles with available learning resources (identifying different learning styles and strategies, matching resources and learning styles, identifying learning environments, developing resource-based learning, assessing an FE college's potential, and evaluating learning materials). Each chapter contains a series of staff development activities. The document contains 10 references and a 12-item bibliography. Handouts and overhead transparencies are appended along with a chart to help assess FE colleges' integration of ILT in libraries and development of flexible and open learning centers. (MN)

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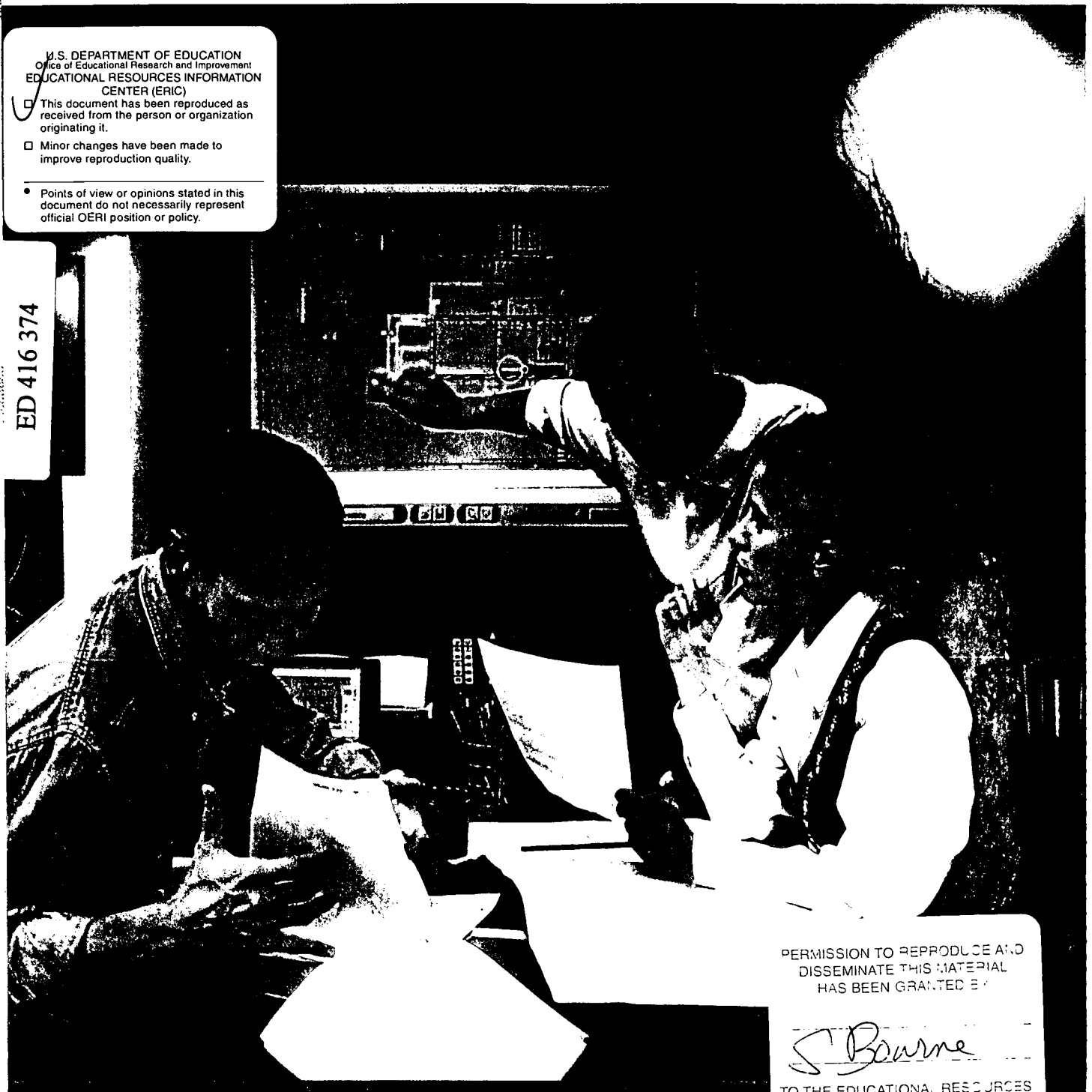

Learning styles: into the future

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Feedback and orders should be directed to:
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Quality in information and learning technology

The QUILT programme aims to support the development of information and learning technology in further education. The programme includes events, publications, multimedia resources, a consultancy service and development activities. These are focused on staff development and on enabling colleges to develop a response to ILT which encompasses staff, curriculum and resources.

About the author

Bill Lockitt is a member of FEDA's education staff. In 1993 he obtained one of the 12 Esmee Fairbairn Fellowships 'to develop multimedia flexible and open learning in order to attract those who would not normally use FE/HE'. During the period of the fellowship, several innovative projects and systems were undertaken in the areas of learning centres/bases, the networking of CD-ROMs and supporting open learning via a library/college/TEC partnership. The latter was awarded the NIACE/NEC Open Learning Award for 1996.

Bill has published widely on the subject of multimedia flexible and open learning. He is currently undertaking a part time PhD investigating the potential of integrated learning systems.

Since joining FEDA, Bill has been responsible for Information and Learning Technologies (ILT) via the QUILT (Quality in Information and Learning Technology) programme (Wales). He has also undertaken a number of consultancies in England and Wales focused on ILT strategic planning, resourced-based learning and computer-assisted/based learning.

Contents

Preface

There is no single model of learning that is perfect for every individual; human beings are far more complex than that. However, there are a number of exceptionally good models which highlight possible areas for future research. One area which has attracted a great deal of attention is that of individual learning *styles*.

Researchers Peter Honey and Alan Mumford (1995) have produced a learning styles inventory which can be used to identify whether individual learners fall into one of four categories: activist, reflector, theorist or pragmatist. This publication will develop this research using the Kolb (1984) 'experiential learning' model as its foundation. The Kolb model looks at the process of learning, and identifies four key factors as the key to learning: concrete experience; reflective observation; abstract conceptualisation, and active experimentation. This publication will attempt to show how this model can be used to develop resourcing and educational/training environments. For a more detailed understanding of these two models refer to *Learning styles* (FEDA, 1995).

The introduction of flexible and open learning areas, distance learning, work-based training and an ever-increasing array of new technology has contributed to changing the way in which individuals learn and institutions deliver education and training. These changes will continue as information learning technology (ILT) develops. It is vital that all involved in education and training understand the potential of ILT. Models need to be developed which can be used to maximise its effect, minimise the costs and provide a foundation for future development.

This publication is designed to help practitioners, managers and governors develop a strategic approach to integrating ILT within flexible and open learning environments, based on an understanding of learning styles. It allows a practical approach, by offering:

- concrete experience: information, case study, model, activity
- reflective observation: questions asking you to reflect upon what you have done
- abstract conceptualisation: a chance to think about new ways of doing things
- active experimentation: putting the new models into practice.

You can access overhead transparencies (OHTs) and other relevant staff development material to use within your institution from the FEDA web page at http://www.feda.ac.uk/PubsSupport/.

From FEDA's website (at http://www.feda.ac.uk) you can also enter the newsgroup to be involved in furthering the debate on ILT and learning styles. I hope you will take advantage of this facility and I look forward to discussing issues with you on the World Wide Web.

Bill Lockitt
http://www.feda.ac.uk

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Overview

This publication begins by introducing the concept of learning styles. Next, it discusses the nature of learning and how to make use of ILT within the context of what the learner already knows. It then looks at ways to match learning styles with resources. A set of staff development activities is provided at the end of each chapter. Summarised at the end of most sections, within each chapter, are the key issues for you to consider. Staff development material referred to in each chapter is reproduced as handouts or OHTs in Appendices 1 and 2 respectively. These may be photocopied. Powerpoint slides will be available from the FEDA website.

Understanding learning styles

Research by Honey and Mumford indicates that your individual learning style influences the way in which you accept and assimilate information. They suggest that it is essential that both the learner and the tutor understand the different learning styles if the learner's full potential is to be realised. This first section will help you to gain a basic understanding of the concept of learning styles, in particular those theories developed by Peter Honey, Alan Mumford and David Kolb.

Unlocking the potential of ILT

This section discusses the nature of learning and what individuals bring to the learning process. It highlights the need for an acceptable definition of learning and for a means to measure that the learning process has taken place using criteria relevant to a modern learning society. This section also looks at the Kolb learning by doing model in the light of new technology and from the context of an education and training environment. Finally, it considers the importance of effective communications to the whole learning process.

Learning resources and environments

This section looks at ways to match resources with learning styles. It considers how to help learners to develop confidence in different learning styles, and how to ensure results in a range of learning environments.

Key issues and questions

Understanding learning styles

- What needs to be done for colleges to develop a philosophy of ILT integration not ILT acquisition?
- Educators/trainers need to drive ILT development, not react to it: how can this be achieved?
- What issues need to be addressed for ILT to be seen as an aid to the learning process not as a replacement for it?
- What 'value added' does ILT bring to the learning process?

- How can this added value be measured?
- What effect does it have on the individual?
- Should we try to adapt ILT to the existing education/training framework or develop a totally new one for future societies?
- Using ILT, can we develop learning materials that will produce holistic learners (individuals that can adapt to all learning/training environments)?
- Can we use ILT to develop systems that lead the learner through all stages of the Kolb learning cycle?
- How do we develop learning environments that develop the full potential of individual learners?
- How do we ensure that learning styles are used to empower people not to categorise them?

Unlocking the potential of ILT

- What definition of learning can be used in a modern learning society?
- Can the same definition be applied to academic education and training?
- Should the needs and aspirations of society dictate the individual learning process?
- Can ILT be used to support the learning process at all levels?
- How do we help learners to recognise good and bad learning experiences?
- What training should we provide to learners using multimedia, flexible and open learning environments and materials?
- How do we identify the learner's past experience and develop individual learning programmes?
- How can ILT be used to enhance the learning experience?
- How can we use the Kolb learning by doing model to evaluate the effectiveness of learning assignments and materials?
- How can we use it to evaluate the learning experience?
- How can we adapt the model to a modern learning society?
- How can we integrate ILT into this process?
- How can ILT be used to improve communications?

Learning resources and environments

- How can we use ILT to produce learners confident in a range of learning styles?
- What are the problems associated with a predominant learning style?
- How can ILT be used to overcome some of these problems?
- How do we use ILT to ensure consistent results in a range of learning environments?
- Multimedia material spans all of the learning styles: is this the reason why it is being accepted more quickly than was the case with older technologies?
- Why is it important to recognise the preferred learning style of the designer of multimedia learning material?
- How can we control the introduction of new technology within an education framework?
- Will interconnectivity be the answer to the regeneration of local economies?
- How many different types of learning environment can you identify in your institution?
- How would you judge the effectiveness of each type of learning environment?

- What are the main barriers to developing flexible learning centres?
- Would considering individual learning styles at the design stage overcome any of these barriers?
- After using the planning tool (see Appendix 3) with a number of colleagues, where are you on a scale of 1-5?
- Are strategies in place to take you to the next level? If not, how can they be developed?
- What differences are there between evaluating traditional learning materials and multimedia learning materials?
- How can multimedia learning materials be integrated into curriculum support?
- What extra facilities need to be provided to ensure that the learner completes the learning cycle?

1 Understanding learning styles

Learning styles affect every aspect of our lives. The way in which we take in information, process it, assimilate it and use it is affected by our predominant learning style.

A large proportion of the population is unaware that learning styles exist. They assume that knowledge comes with age. Many are disappointed and never know the reason why.

Even people involved in education and training have little knowledge of learning styles. They assume that if they are good at teaching and produce enough notes and handouts the learner will be capable of doing the rest. This method has been unsuccessful for a large proportion of learners and, until recently, little was done to find out why.

This situation changed in the 1980s, due mainly to work by researchers such as Peter Honey, Alan Mumford and David Kolb. Their work began to unfold the secrets of individual learning styles, leading to comprehensive and transferable models which can easily be used by individuals, educators and trainers.

The availability and increasing sophistication of ILT is having huge effects on education and training and on the learning environments and methodologies used. Because few people in education expected the rapid shift towards ILT, the focus has tended to be on acquiring ILT rather than looking more widely at ways to create integrated ILT learning environments.

Time will tell how effective these new models of learning are. One thing is clear: there is no turning back. ILT is here to stay and it is up to educators and trainers to decide the most effective and efficient methods for its use.

- **What needs to be done for colleges to develop a philosophy of ILT integration not ILT acquisition?**
- **Educators/trainers need to drive ILT development, not react to it: how can this be achieved?**

PUTTING THE LEARNING INTO CONTEXT

Do learners have an individual learning style or approach to study which should be taken into account?

Laurillard, 1993

This is a question many academics have asked themselves for the past 30 years. They have produced and used a number of models to support the hypothesis that learners do have an individual learning style.

There is no simple answer. Researchers will be analysing data for a number of years before any clear picture of how people learn starts to emerge, and new technology is playing a leading role in this process.

The introduction of information learning technologies into the learning equation has produced a varied response. Some see ILT as the saviour of education; for them, ILT stands for 'I Love Technology'. Others are not convinced and remember the promises made by the early 'teaching machines' which now litter many a staffroom cupboard; for them, ILT means 'I Loath Technology'.

Most see technology for what it is, a teaching and learning aid that, in the hands of an 'expert', can deliver surprising results. In this context, 'expert' does not mean someone who is IT competent; it means someone who is aware of the potential of ILT and is able to integrate it successfully into the learning process.

Integrating ILT into the curriculum is not a difficult task so long as your aims and objectives are clear. What added value will the introduction of ILT bring to the learning process? What effect does it have on the individual? If the added value cannot be identified should the system be changed? If so how?

- **What issues need to be addressed for ILT to be seen as an aid to the learning process not as a replacement for it?**
- **What 'value added' does ILT bring to the learning process?**
- **How can this added value be measured?**
- **What effect does it have on the individual?**

CRITICAL QUESTIONS

In his book *The fifth language*, Robert Logan identifies eight critical questions which should be asked if an integrated model of education and work-based training is to be achieved:

1 *How is computing (ILT) changing the work patterns and the organisation of social institutions?*

2 *How can computers (ILT) be used to achieve present educational goals?*

3 *How will present educational goals change to accommodate changes in the nature of work due to the widespread use of computers and other information technology?*

4 *How will computers (ILT) change our notion of what we mean by communication, information processing, language, learning, education and work?*

5 *How can the school (educational/training) system be restructured so that the goals of education and the vocational needs of society in the information age be better matched?*

6 *How can computing (ILT) be harnessed to inculcate students with the desire for lifelong learning?*

7 *How can work be organised to promote learning naturally?*

8 *How can education in the workplace be better organised to improve productivity so that learning becomes a lifelong activity and workers are properly trained to do their jobs?*

Logan, 1995

The way in which education and training will be delivered in the future will be dramatically different from the systems we use today. Now is an ideal time to discuss the factors affecting the learning process, so that we develop the 'learning society' of the future. ILT will have an increasingly important role to play in education and training, so research is needed to identify the most

effective delivery methodologies and learning environments. We also need to consider whether we should try to adapt ILT to the existing education and training framework or develop a totally new one for future societies.

- **Should we try to adapt ILT to the existing education/training framework or develop a totally new one for future societies?**

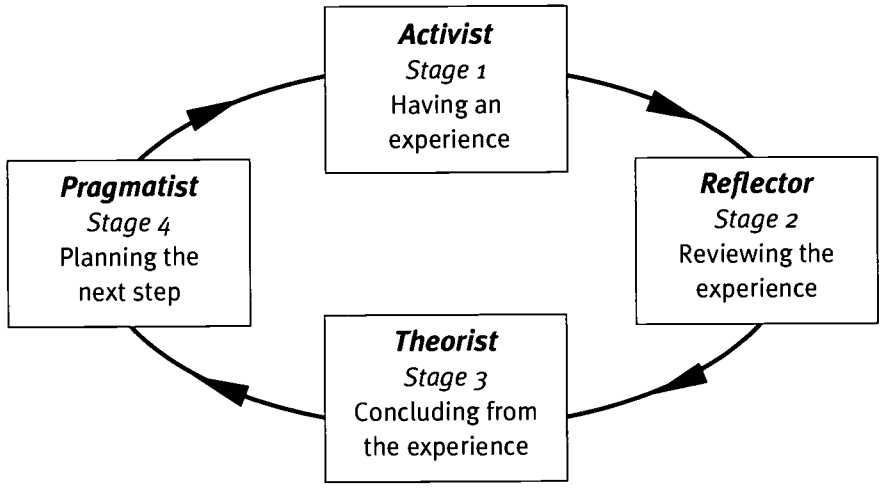
HONEY AND MUMFORD

Honey and Mumford (1992) found that although people had preferred methods of learning, most were unaware of any preference or the existence of learning styles. They also suggested that the learning experience could be improved if the learner was more aware of learning styles. They developed the Kolb learning cycle (Kolb, 1984) and superimposed his four stages of learning on to it (see Figure 1).

Honey and Mumford's research indicates that individuals favour particular stages of the learning cycle and that this preference can distort the learning process. It highlights the need for learners to develop learning techniques which lead them through all four stages of learning to develop a holistic learning style.

- **Using ILT, can we develop learning materials that will produce holistic learners (individuals that can adapt to all learning/training environments)?**

Figure 1 Learning cycle and learning styles



Honey and Mumford, 1992

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Descriptions of learning styles

The following descriptions are summaries of Honey and Mumford's four learning styles:

Activists:

- need to involve themselves fully in the experience
- are open minded and enthusiastic about new experiences
- enjoy the 'here and now'
- will normally act first and then think about the consequences later
- are happy to tackle any problem but once the excitement has gone are looking for something new to do
- get bored with the 'every day' activities
- thrive on the 'challenge'.

Reflectors:

- need to observe and ponder
- consider all of the information to hand
- delay, as long as possible, coming to a final conclusion
- are thorough and cautious
- tend to adopt a low profile
- look at the 'big picture'.

Theorists:

- develop logical sound theories
- have a step-by-step approach to problem solving
- are perfectionists
- feel uncomfortable with subjective judgements
- like to analyse and synthesise.

Pragmatists:

- like to try new ideas to see if they work in practice
- are quick to get on with things
- dislike open-ended discussion
- are very practical
- see problems and opportunities as a challenge.

- **Can we use ILT to develop systems that lead the learner through all stages of the Kolb learning cycle?**
- **How do we develop learning environments that develop the full potential of individual learners?**
- **How do we ensure that learning styles are used to empower people not to categorise them?**

KOLB

David Kolb's original learning styles inventory was based on experiential learning theory. Four learning modes were identified:

Concrete experience

- emphasis on doing; action; feeling

Reflective observation

- understanding what has happened
- reflecting upon the experience
- trying to understand the meaning of the experience

Abstract conceptualisation

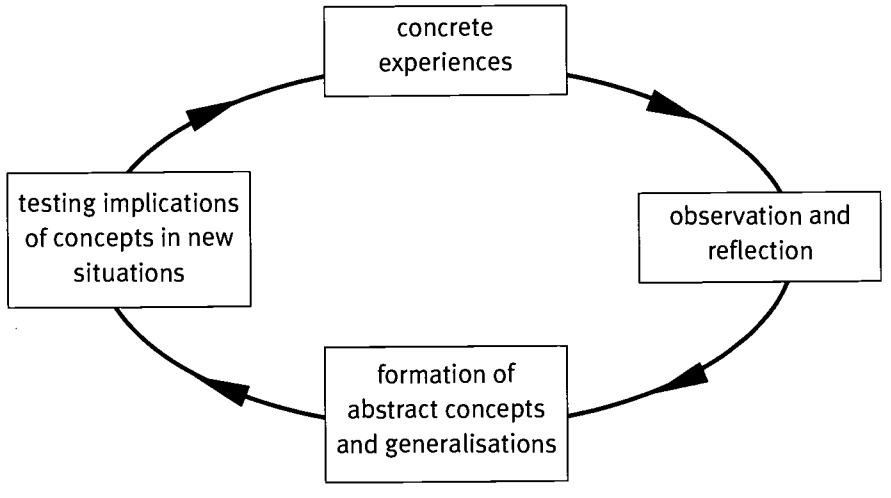
- thinking as opposed to feeling
- forming new ideas, concepts
- constructing theories
- planning new ways of doing things

Active experimentation

- testing the new concept or theory
- bringing about change
- improving what has been done before

Kolb represents these four learning modes as a 'learning cycle' (see Figure 2).

Figure 2 Learning cycle



Kolb, 1984

Kolb states in *Experiential Learning* (1984) that the learning experience is unique for everyone and that identification of preferred learning styles should not be used to typecast learners. Individual learning styles should be used to develop potential and extend choice to the learner. Kolb puts forward the model as a means of managing the learning process and providing a basis for educational and personal development. If this is true the introduction of ILT will give educators and trainers the necessary tools to test the theory.

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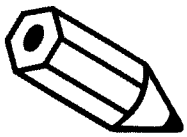


STAFF DEVELOPMENT ACTIVITIES

(See OHTs 1–3.)

Critical questions

- Discuss the eight critical questions with colleagues and produce three answers for each question.
- Apply the eight questions to a particular curriculum area; use the answers from the first task to produce a framework for ILT development.

Honey and Mumford

- Ask each member of staff to produce a short learning assignment, based on their own curriculum specialism, which takes the learner through the four stages of the Honey and Mumford learning cycle.
- Discuss the possible uses of ILT to improve this learning experience. Focus on:
  - what would be used
  - why it would be used
  - how it would be used
  - where it would be used
  - when it would be used

One critical question is:

- Would the introduction of ILT enhance the learning experience?

2 Unlocking the potential of ILT

Learners entering FE bring a great deal of experience with them. It is important to identify and then build on their individual strengths rather than making them start from the beginning again. Effective communication is an essential part of the learning process. It is important to understand what is being communicated, why it is being done, who will benefit, where and how it should take place.

Nature of learning

In an ideal world, to help us to understand how people learn there would be an accepted definition of learning and an accepted method for recognising whether it has taken place. There would also be an accepted way to see where the learning process fits in with modern society. Unfortunately, as in many areas of education and training, things are not that simple.

Individuals have their own definitions of learning and how it should be judged. To some, learning is the retention of knowledge; others will point to the acquisition of skills; yet others will say that learning is true understanding and the ability to assimilate prior knowledge. Most importantly, everyone's learning experience is unique. Most people's past experience of learning is of the process taking place in formal environments: schools, colleges, universities and more recently training agencies via lectures or formal classroom teaching. Flexible learning methodologies were generally discouraged and any change in delivery methodologies was slow to occur.

In 1995, FEDA put forward the concept of learning at individual, team, institutional and national levels in its publication *Learning styles* (FEDA, 1995, p6). Figure 3 indicates what these different methods of learning involve and how they interrelate.

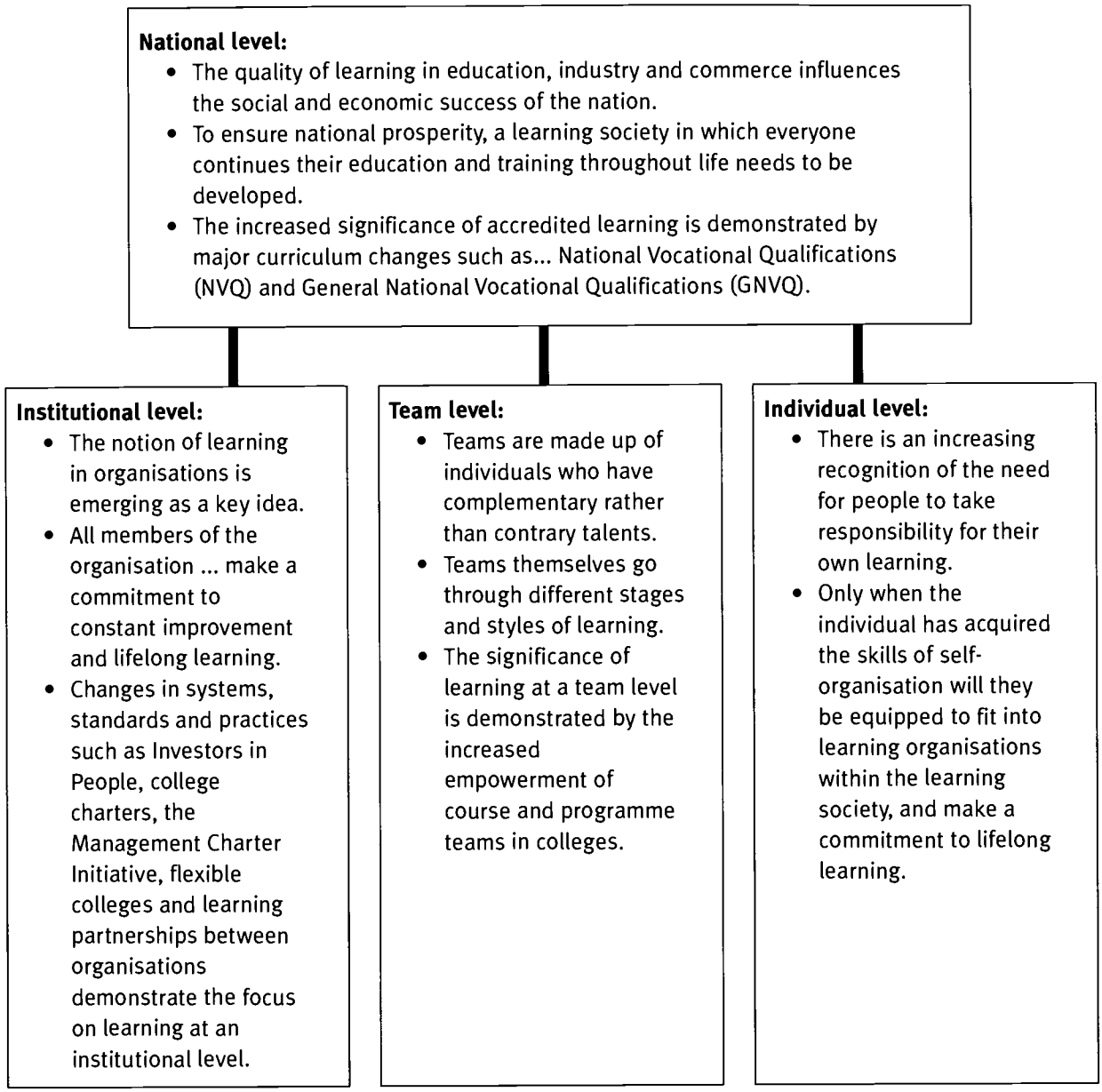
- **What definition of learning can be used in a modern learning society?**
- **Can the same definition be applied to academic education and training?**
- **Should the needs and aspirations of society dictate the individual learning process?**
- **Can ILT be used to support the learning process at all levels?**

Individual learner

Individuals are now bringing a great deal of experience to the learning process. During their formal education they will have encountered a number of delivery methodologies which, subconsciously, will have shaped the way they learn and assimilate new information. While the tutor should recognise and build upon what has already been learned, taking too much for granted can be dangerous. As Diana Laurillard points out:

> *The knowledge that students bring to a course will necessarily affect how they deal with the new knowledge being taught ... each new course builds on an assumption about what the student has already mastered. This is a dangerous assumption.... The teacher will often be building on sand.*
>
> *Laurillard, 1993, p30*

Figure 3 Levels at which learning takes place

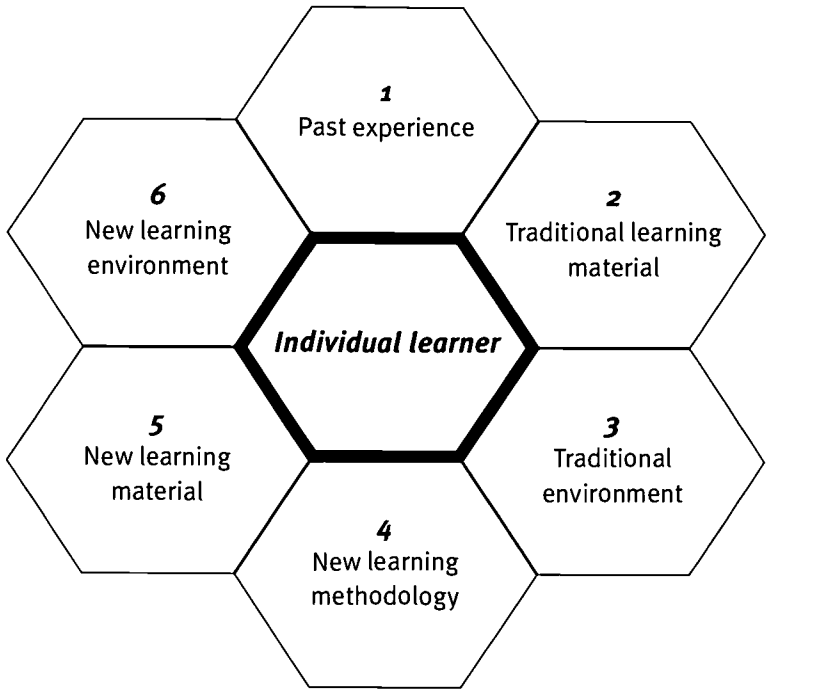


Learning styles, FEDA, 1995

Figure 4 highlights some of the factors which influence learners and the learning process. By the time learners reach the further or adult education stage they have already encountered a variety of learning experiences, both good and bad. Because learning is perceived as a natural process, few learners have the ability or skill to analyse these learning experiences. Many learners wrongly believe that learning comes with age and the older you get the more you know. We can help them to overcome this and achieve more from their learning by ensuring they are aware of successful learning techniques right at the start of the learning process.

Elements 1-3 in Figure 4 exemplify the traditional approach to learning. The learner will already have past experience of the learning process (1) and much of this will have been based on traditional learning material (2), within traditional learning environments (3).

Figure 4 What the individual brings to the learning process



Elements 4-6 relate to the new learning process. Many of the learners accessing education and training will not be familiar with new learning methodologies (4), for example, student-centred learning which places a great deal of responsibility for learning on the learner themselves. They will also be unfamiliar with the more interactive learning materials being used (5), for example, CD-ROM, computer-based or assisted learning programmes, the Internet and the environments (6) in which these new materials are delivered.

Staff familiar with the new skills required should be training learners how to use modern learning environments effectively. The new learning processes (4, 5, 6) need to be related to, and integrated with, the past experiences of the learner. Learning should be a process of building on what has already been achieved by the individual, not a process of taking them back to basics and starting again. Tutors should be helping learners to assimilate new learning models and integrate them into their own perceptions of learning.

- **How do we help learners to recognise good and bad learning experiences?**
- **What training should we provide to learners using multimedia, flexible and open learning environments and materials?**
- **How do we identify the learner's past experience and develop individual learning programmes?**
- **How can ILT be used to enhance the learning experience?**

Developing the Kolb learning by doing model

The Kolb model, outlined in Chapter 1, is an extremely powerful, yet simple, model on which to understand the type of activities learners need for 'true learning' to take place.

The model identifies some of the activities a teacher/lecturer/trainer can include in the learning process. The learner can enter the model at any stage but must complete at least one full cycle. An example may be:

Abstract conceptualisation:

- The learner is given an input on an area of science. The learner also reads several books and journals on the subject and then thinks of an area of investigation and develops a hypothesis.

Active experimentation:

- As an individual, in groups or in consultation with the tutor, the learner conceptualises an experiment or simulation which could be used to confirm the hypothesis.

Concrete experience:

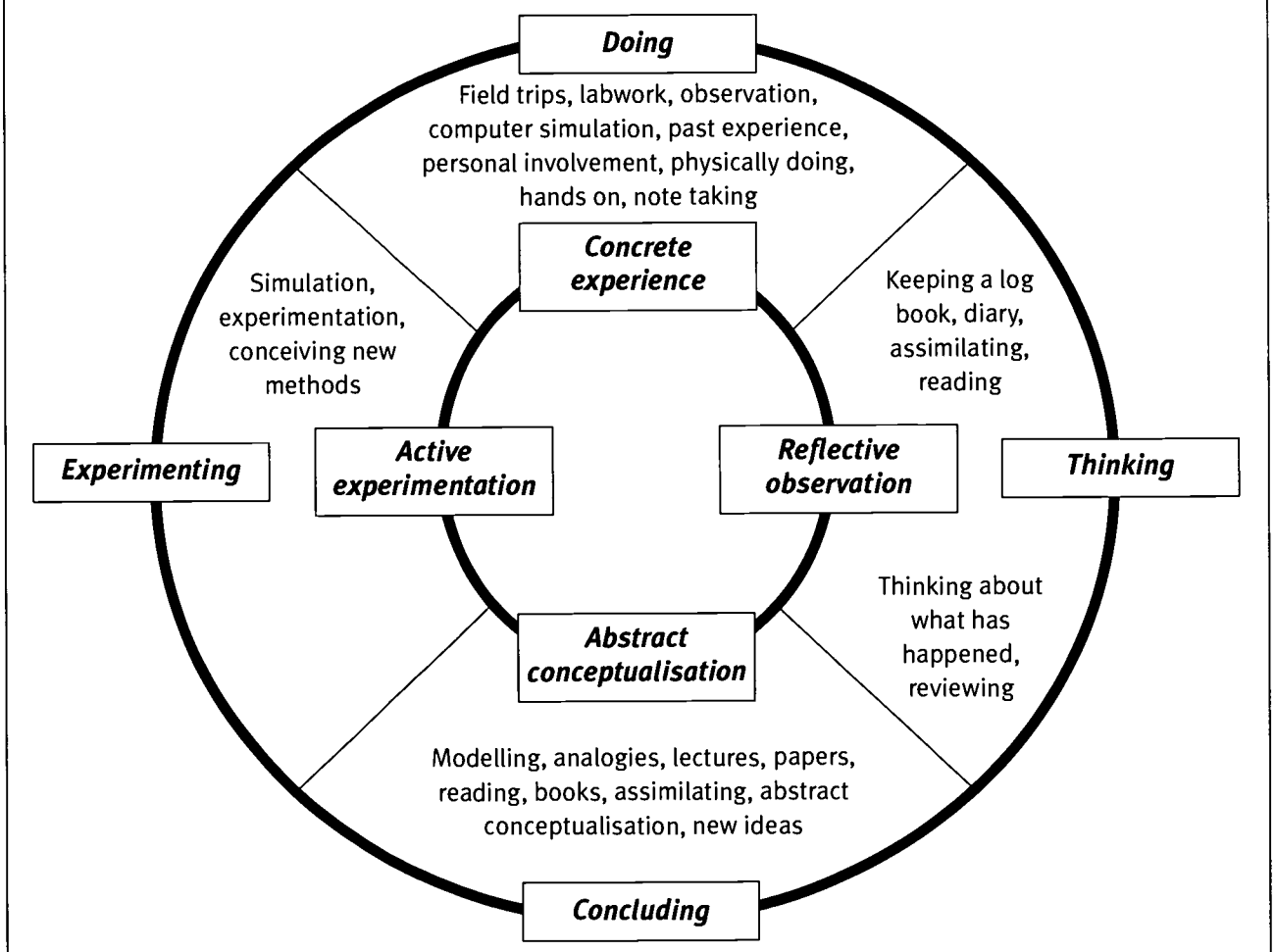
- The learner carries out the experiment or simulation (with due regard to health and safety) and experiences the result.

Reflective observation:

- The learner thinks about what has happened and compares this with the desired outcome. At this stage several things can happen:
  - the desired outcome has been achieved – the learner can move on
  - the desired outcome has not been achieved – the learner moves through the process until it has
  - an unexpected outcome has been achieved – the learner can re-conceptualise the outcome and move through the process.

The learner must move through the complete learning cycle if true learning is to take place. It is important to check through all lesson plans, assignments, projects and so on, to ensure that all areas of the Kolb learning by doing (LBD) model are involved.

Figure 5 Putting the Kolb 'learning by doing model' into context



We are all familiar with people who never learn from their experiences, people who think a lot but never do anything, others who conceptualise innovations but never put them into practice and those that experiment but never develop anything useful. These are all examples of people locked into one or perhaps two areas of the Kolb LBD cycle. Knowledge of Kolb's learning by doing model gives people the key to the learning process and allows them to unlock their full potential.

The inner circle on Figure 5 shows the Kolb learning by doing cycle. The outside circle gives 'key words' which sum up the process involved at each stage. In between are examples of types of activity which enhance that particular part of the learning cycle. For example:

Concrete experience:
- A science tutor takes a group on a field trip. The trip is based on knowledge the students have been given prior to the trip and the tutor provides notes for the students and highlights practical 'hands-on' activities which will be performed when they arrive.

Reflective observation:
- During the field trip the students take notes on the practical activities and keep a diary of the days events. They also note important issues for discussion at a later stage.

Abstract conceptualisation:
- Back at college the students compare their findings and/or hypothesis by researching, reading, discussing, debating and gathering information.

Active experimentation:
- Using a computer, the students compare their findings with theoretical experiments generated by simulation exercises. They discuss the findings and draw up an action plan. This would lead to another visit through the learning cycle.

Taking students through the full learning cycle leads to a truly challenging learning experience. Not taking students through the learning cycle may mean that the only outcome is a day out.

- **How can we use the Kolb LBD model to evaluate the effectiveness of learning assignments and materials?**
- **How can we use it to evaluate the learning experience?**
- **How can we adapt the model to a modern learning society?**
- **How can we integrate ILT into this process?**

EFFECTIVE COMMUNICATIONS

Effective communications is an essential part of any model constructed to improve the effectiveness of the learning process. Figure 6 illustrates the components of effective communications. It should:

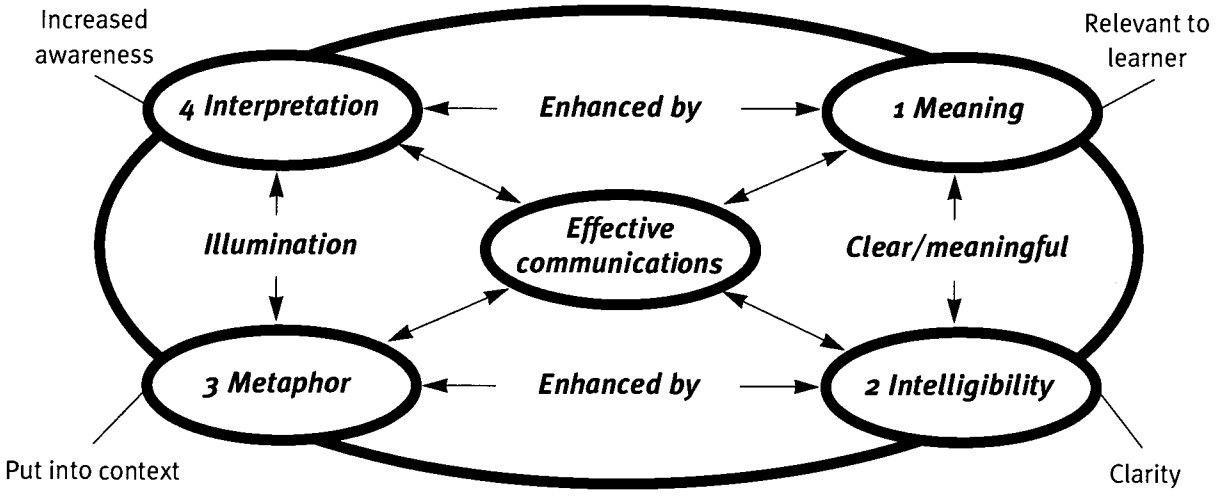
- have meaning (1) – be relevant to the learner's needs and contain information useful to the learner
- be clear and coherent (2) – the method used to convey the information should not contain any distractions and the information should be in a format the learner can understand

- use symbols and imagery to put the information into context (3) – the use of metaphor allows concepts to be developed within the environment of familiar ideas
- lead to further clarification and illumination (4) – allowing the learner to interpret and assimilate the information.

As with the Kolb LBD model, this process is cyclical in nature and may have to be repeated a number of times and in a number of ways before effective communications take place.

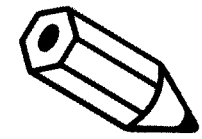
- **How can ILT be used to improve communications?**

Figure 6 Effective communications model



STAFF DEVELOPMENT ACTIVITIES

(See Handouts 1–2 and OHTs 4–6.)



Evaluating the learning process

- Identify criteria that could be used to evaluate the learning process.
- Are the criteria you have identified relevant to both academic and vocational education/learning?
- If there are differences, what are they?
- Produce a list of performance criteria that is relevant to both academic and vocational education.
- Discuss the potential role of ILT within this evaluation.

Learning experience

- Identify the elements that individuals bring to the learning process.
- Identify the barriers which may affect the individual learning process.
- List the advantages and disadvantages of traditional learning methodologies.
- List the advantages and disadvantages of new learning delivery methodologies.
- Devise a learning experience, using ILT, that will take the learner through all four areas of the Kolb learning by doing model.

Effective communications

- How can ILT be used to improve communications?
- Discuss the types of resources you consider would be most effective.
- List the advantages the identified resources would bring to the learning experience.

3 Learning resources and environments

It is vitally important that trainers (educators) are not dazzled by new technology and lose sight of its place in the work of training and learning.
Riding, 1996

LEARNING STYLES AND STRATEGIES

A simple distinction between learning styles and strategies would be that learning styles relate to the in-built feelings people are born with and learning strategies are the processes by which learning is achieved. Obviously, it is more complicated than this. Learning styles are not fixed at birth. Individuals can modify their learning styles to adapt to different environments, depending on the type of environment and how long they spend in it. Successful learners are those who can move through the different learning styles as the need arises.

Learning strategies can be taught. How to evaluate literature, use the Internet, take notes and acquire memory techniques are just some of the positive things tutors and trainers can teach their learners to improve the learning outcomes.

A combination of flexible learning styles, an understanding of efficient learning strategies, supported by information learning technologies within a flexible, supported environment will produce a learning experience which suits individual styles and maximises the learner's potential.

To achieve this winning combination, those involved – tutors, learners and management – must be fully aware of what is required. There needs to be a match between individual learning styles and delivery styles. ILT, with its multimedia capability, holds some, but not all, of the answers.

We need to adopt a holistic view of learning when developing learning resources and environments. Computer-based learning (CBT) and computer-assisted learning (CAL) will achieve variable results depending upon the environment in which they are situated and the delivery methodology used. The same piece of computer-based software will produce different results when used in a 'teacher-centred' rather than a 'student-centred' environment. Before you start designing learning environments, you need to be clear about the results you want to achieve.

- **How can we use ILT to produce learners confident in a range of learning styles?**
- **What are the problems associated with a predominant learning style?**
- **How can ILT be used to overcome some of these problems?**
- **How do we use ILT to ensure consistent results in a range of learning environments?**

MATCHING RESOURCES AND LEARNING STYLES

Learning styles can be put into three categories relating to the senses:

- auditory – using words and sounds for learning
- visual – visualising images during the learning process
- kinesthetic – feeling and doing things in order to learn

Figure 7 links resources and learning styles to each category. This is not an extensive list, but it does show the way in which ILT spans all of the preferred learning styles. Most multimedia applications can be used effectively with all types of learners. While CBT/CAL material is in each category, its effectiveness may be limited by the preferred learning style of its designer. If the person producing it has a preference for visual images rather than audio, this bias will affect the type of people who benefit from it. Similarly, designers of multimedia learning material need to be as aware of the effects of learning styles as those practitioners who will use it.

Using one particular resource or delivery methodology exclusively can be detrimental to the other two categories of learner. For example, doing this in a class of 30 where the learning styles were divided equally then you may only be reaching effectively one-third of the class. This is simplifying the situation; even in the case of a lecture, motivated kinesthetic learners would be actively engaged in note-taking and visual learners would be constructing their own images of what was being said.

Figure 8 shows the extent to which different resources are being used in colleges today. Not surprisingly, the 'older' technology is widely accessible while multimedia radio, digital television and virtual reality are just appearing on the scene. However, new technology is being widely accepted and adopted at a faster rate than was the case with radio and television. It will be interesting to look again at the availability of resources in 12 months time when the impact of digital transmission has been more fully realised.

Figure 7 Matching resources and learning styles

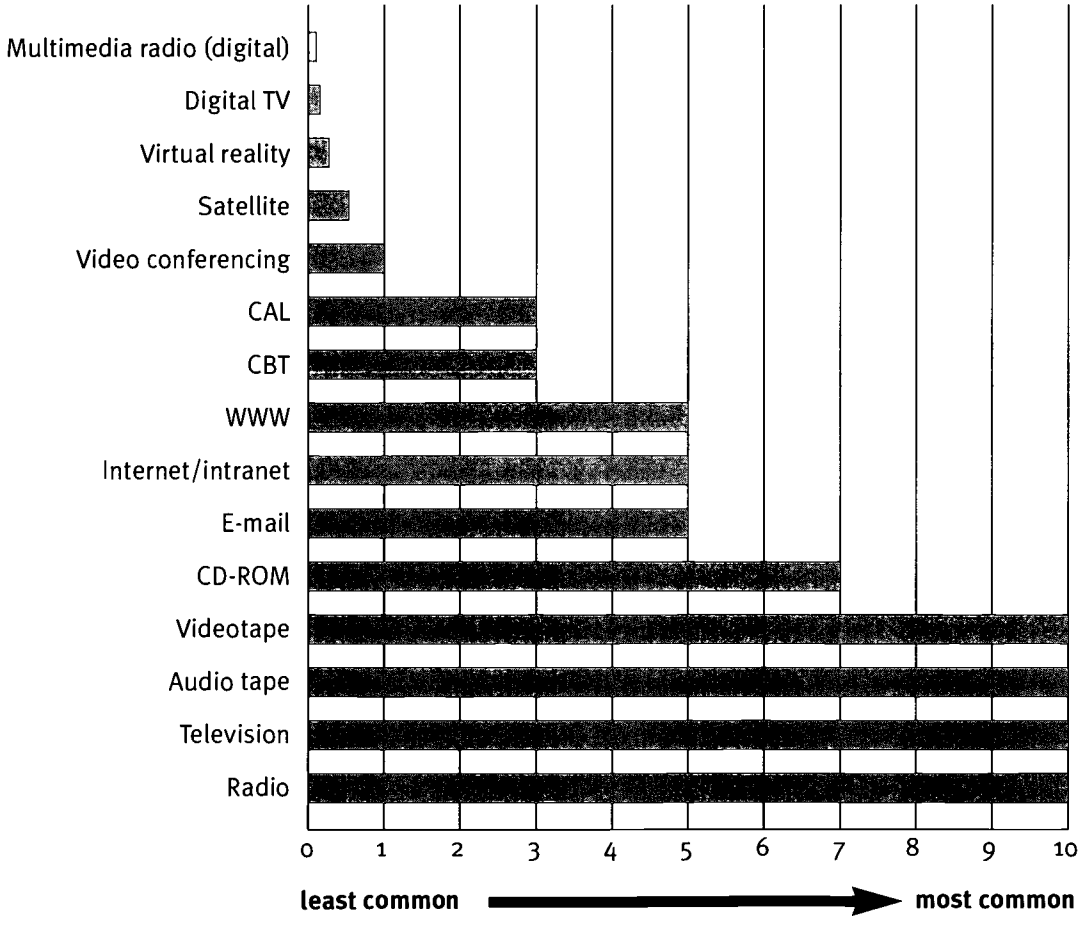
Auditory	Visual	Kinesthetic
Audio tape	CD-ROM	CD-ROM
CD-ROM	Computer-assisted training	Computer-assisted learning
Computer-assisted training	Computer-based training	Computer-based training
Computer-based training	E-mail	Digital television
Dictation	Internet/Intranet	Discussion
Discussion	Multimedia radio (digital)	Internet/Intranet
Internet/intranet	OHTs	Labwork
Lectures	Photographs	Multimedia radio (digital)
Multimedia radio (digital)	Printed material	Satellite
Radio	Satellite	Videoconferencing
Videoconferencing	Television	Virtual reality
	Videoconferencing	WWW
	Video tape	
	Virtual reality	
	WWW	

Since the middle of 1996, the introduction of college 'intranets' has been one of the largest areas of growth. These are systems which look like the Internet, have the same feel as the Internet, but are easier to control and can contain learning material. A number of the college-based projects funded by FEDA's QUILT programme are developing innovative uses for the intranet. (Results of the Wales and England projects are available on the FEDA Web page.)

A large number of colleges have quite rightly concentrated funding on developing interconnectivity via cabled networks of computers. This investment will create the backbone of a sophisticated network system capable of running audio and visual files over long distances, with little loss of quality. This interconnectivity will also benefit local businesses and industry, library services, schools, TECs and higher education and will allow colleges to take a leading role in regenerating local economies.

- **Multimedia material spans all of the learning styles: is this the reason why it is being accepted more quickly than was the case with older technologies?**
- **Why is it important to recognise the preferred learning style of the designer of multimedia learning material?**
- **How can we control the introduction of new technology within an education framework?**
- **Will interconnectivity be the answer to the regeneration of local economies?**

Figure 8 Resource availability



IDENTIFYING THE LEARNING ENVIRONMENT

Figure 9 offers a simple guide to identifying existing learning environments, or conceptualising new ones. The ordering is incidental; there is no intention to highlight any one learning environment as being better than another. A good mix of learning environments can be as motivating and challenging to the learner as a change of delivery; people tend to get bored with the same environment day in day out.

Tutor and learner in the same place at the same time:

This is a timetabled or structured environment in which the tutor arranges with the learner the times and location of their meeting. It is typical of a classroom or lecturing environment and, unless flexible or open-ended assignments are being used, will probably rely on traditional delivery methodologies. ILT can certainly be used in this environment but it would be inclined to be tutor-driven rather than learner-centred.

Tutor and learner in the same place but at a different time:

This indicates a more flexible environment and delivery methodology. Many flexible and open learning environments are being developed using this as a model. Both tutors and learners could be timetabled into this environment or it could be operated as a drop-in resource with 'learning facilitators' providing help and advice. Because the learners and tutors are not in the environment at the same time on a regular basis this type of learning environment would probably be assignment-driven and use a variety of ILT delivery methodologies. It could also be used as a resource which supplements formal classes.

Figure 9 Environmental identification model

Method	Tutor/learner	Environment
• classroom • lecture • meetings	Tutor and learner in the same place at the same time	Timetabled environment; classroom or lecture-based
• flexible • open learning • drop in • assignment-based	Tutor and learner in the same place but at a different time	Flexible/open learning environment
• videoconferencing • telephone • e-mail • WWW	Tutor and learner in a different place at the same time	Flexible/open learning and ILT environment
• Internet • WWW • e-mail • fax • post	Tutor and learner in a different place at a different time	Virtual learning environment

Tutor and learner in a different place at the same time:

College outreach centres with support via videoconferencing, e-mail, the Internet, telephone or fax are a typical example of this type of learning environment. Support could also be offered to learners in their own homes, business or industry, prison or abroad. Many colleges and training centres are experimenting with this type of environment to support learners who would otherwise not be able to access education. This type of environment tends to push the limits of ILT and is costly to set up but once the initial resources have been purchased running costs are usually low. Costs can be kept to a minimum by utilising space unsuitable for a large number of learners.

Tutor and learner in a different place at a different time:

This is a truly 'virtual-learning environment' which relies heavily on ILT for the support of learners. A number of colleges are experimenting with it. Usually the set-up costs are high but this is compensated for by reduced resourcing and building overheads. The Open University is a good example of this type of learning environment. A great deal of time and expertise is required to make the learning experience effective. The quality of the learning material in particular should compensate for the lack of personal contact and motivate the learner.

To save time, effort and funding, decide what type of learning environment you wish to provide before any building construction or modification is carried out.

- **How many different types of learning environment can you identify in your institution?**
- **How would you judge the effectiveness of each type of learning environment?**

DEVELOPING RESOURCE-BASED LEARNING

The development of learning centres (cross-curricular support) and learning bases (curricular-specific support) can be one of the largest and most expensive projects any college can undertake. Recent research by FEDA on the development of resource-based learning environments (*Learning resource centres*, FEDA, 1997) discusses the following areas of concern:

- staffing
- development costs
- resource costs
- assessment
- tracking
- staff development
- quality.

All of these areas should be considered when developing resource-based learning environments. A great deal of time and effort by staff and management will be required to develop a truly flexible environment. The expected outcomes of the management at the outset will inevitably have an effect on the way in which the resources are eventually used.

One aspect which should also be taken into consideration at this early stage is learning styles. Use the information given in Chapters 1 and 2 of this publication to add a new dimension to the design and resourcing of your learning centres.

Those involved in designing and managing learning centres should find that a knowledge of learning styles and ILT will help them to provide a flexible learning environment in which all individuals can reach their full potential.

- **What are the main barriers to developing flexible learning centres?**
- **Would considering individual learning styles at the design stage overcome any of these barriers?**

ASSESSING YOUR COLLEGE'S POTENTIAL

A management tool for the strategic development of IT, produced by the National Council for Educational Technology (NCET) in 1995, identifies 14 factors significant to influencing change. It has five strategic levels, on to which individuals can map information regarding their college IT development:

1 Localised
2 Co-ordinated
3 Transformative
4 Embedded
5 Innovative

Appendix 3 offers a modified version of this management tool. You can use this to identify the strategic development required to create truly flexible/open learning areas and systems. For continuity it includes the five strategic headings used in NCET's version, but ILT development is incorporated differently. NCET defines the five levels as follows (*Managing IT*, NCET, 1995):

Strategic levels

Localised

ILT application at a localised level is characterised by unco-ordinated development. Such an institution might be able to demonstrate areas of good practice, or even excellence, in curriculum or administrative activities. However, the absence of an effectively-implemented strategic plan will restrict the broader application of ILT. Staff who seek involvement in the decision-making will have access to do so, but there are no strategies for encouraging them to do so.

Co-ordinated

Development of ILT is co-ordinated at both strategic and operational levels. ILT is valued across the whole curriculum and there is a commitment to provide resources to support curriculum development. ILT resources will be managed at a central level by staff involved in broader curriculum issues, not just those with a technical interest. There will be a policy to support staff in developing ILT in the curriculum.

Transformative

At this level any change involving ILT needs to be capable of being supported over a period of time. A well-structured staff development programme will be in place which allows staff needs to be identified and met. There will be a com-

mitment by senior management to provide an environment in which staff can consolidate ILT skills and gain the confidence to develop further. ILT and learning resources will be seen as closely related and will be developed in tandem.

Embedded

At this level, there will be efforts made to embed ILT in everyday educational practice. The integration and exploitation of ILT across the curriculum will be supported within the staff development programme. This is expected to lead to changes in the teaching styles used. Staff throughout the institution will use computer-based student tracking, administrative and learning systems regularly. Most staff will use electronic communication on a daily basis.

Innovative

This stage within the ILT development process has the potential to be the most threatening and unpredictable. There is a desire to find new uses of ILT, and a willingness to accept high levels of risk and the strategies accompanying them. A visionary institution will tend to research new technological developments to evaluate their possible impacts on the curriculum. It will then look to incorporate those which show potential. Staff will use innovative teaching and learning strategies and there may also be an innovative approach to timetabling and resource allocation to ensure maximum use of ILT. The institution will make partners with external agencies, including ones in business and commerce.

Using the strategic planning tool

Use the table in Appendix 3 to gain an overview of your college's approach to flexible and open learning and to discover its strengths and weaknesses. Ask a variety of staff from facilitator to principal to answer the questions in the table to find out their perceptions of your college's approach.

- **After using the planning tool with a number of colleagues, where are you on a scale of 1-5?**
- **Are strategies in place to take you to the next level? If not, how can they be developed?**

EVALUATING LEARNING MATERIALS

Most tutors are familiar with evaluating printed material. Before selecting a book, magazine, or any such material to support curriculum delivery they would ask:

- How does this material fit into the learning process?
- What added extra will it bring to the learning process?
- Where should it be used within the learning process ?
- Why should I use this material rather than any other?
- When would be the best time to use it?

One question they may not ask is:

- How can I adapt the material so that it will benefit the different learning styles of my students and take them through the Kolb learning cycle?

Taking the printed material as an example:

- reading a book would appeal to the visual learner
- reading and discussing/debating the book would appeal to visual and auditory learners
- reading the book, taking active notes, answering questions posed by the tutor, discussing and debating new concepts and developing new ideas would appeal to the auditory, visual and kinesthetic learner.

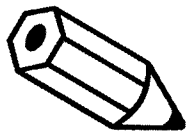
The last example would also take the learner through the four stages of the Kolb learning cycle.

Evaluating multimedia material is not quite as simple. It becomes a little more manageable once you realise that the producers of such learning materials also have preferred learning styles. Try to identify the preferred learning style by asking such questions as:

- Is the information presented in mainly text, audio, video/photographs, or is there a good mix of delivery?
- Are learners presented with information in a linear format or can they move freely through the package actively searching for the answers?
- Does the package ask the learner to do things or does it just give information for them to receive?

Once you have noted the key attributes of the package, relate them to the four learning styles and three preferred methods of learning (auditory, visual and kinesthetic). It should then be possible to identify for what type of learner this software would be useful. Assessing the suitability of software to the curriculum is the role of the curriculum expert; this is not something that will be covered in this publication.

- **What differences are there between evaluating traditional learning materials and multimedia learning materials?**
- **How can multimedia learning materials be integrated into curriculum support?**
- **What extra facilities need to be provided to ensure that the learner completes the learning cycle?**



STAFF DEVELOPMENT ACTIVITIES

(See Handouts 4–5 and OHT 8.)

Developing individual learning and assessment

- Discuss the advantages and disadvantages of a predominant learning style.
- How can we use ILT to help learners to develop confidence in using a range of learning styles?
- What criteria can be used to assess the effectiveness of individual learning outcomes within a range of education environments?
- What part can ILT play in the assessment process?

Identifying the benefits of new technology

- In small groups, identify an area of new technology you feel would be of benefit to your institution. Discuss the reasons for your selection and identify the benefits to the:
  - tutor/trainer
  - organisation
  - student

ILT strategic planning

- Ask colleagues to fill in the ILT strategic planning tool in Appendix 3.
- Discuss any issues highlighted. List the main points.
- Discuss areas of good practice. List the main points.
- Identify key points for ILT strategic development.

Into the future

Due to its flexibility, new technology has led to a number of innovations within education and training. It is having a major impact upon the delivery and content of the curriculum, although few are clear about the direction in which it is taking us. However, unlike past 'technological revolutions' this one will continue to have greater influence in the future.

Our present level of technology offers an education and training tool that can be used effectively and ineffectively. (Developments in bio-technology may, in the future, alter this situation. However, at the time of publication there are no 'learning systems' that can be used to take learners through the complete learning process. Other areas of science, including genetic engineering, may also impact upon the learning process.) The effectiveness of ILT in enhancing the learning process will depend upon who uses it, the way it is being used and the reason for its use.

In the words of Ralph Lapp, a scientist and writer:

> *We are aboard a train which is gathering speed, racing down a track on which there are an unknown number of switches leading to unknown destinations. No single scientist is in the engine cab and there may be demons at the switch. Most of society is in the caboose looking backwards.*
>
> *Toffler, 1972, p390*

Since 1971 the speed of the 'train' and the number of destinations to which ILT can take us has increased significantly. Effective use of ILT can only be made if all contributing factors are taken into consideration. This publication has focused on just one of those factors which need to be incorporated into the planning process: individual learning styles.

If society is capable of conceptualising such powerful tools it must be able to use them effectively. If not, we have a system of technology for technology's sake and not for the benefit of every member of society. We have the tools; now we need to use our minds to realise their full potential.

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Appendices

Appendix 1: Handouts

1 **Key issues and questions**

2 **National, institutional, team and individual learning**

3 **Kolb in context**

4 **Matching resources and learning styles**

5 **Resource availability**

Understanding learning styles

- What needs to be done for colleges to develop a philosophy of ILT integration not ILT acquisition?
- Educators/trainers need to drive ILT development, not react to it: how can this be achieved?
- What issues need to be addressed for ILT to be seen as an aid to the learning process not as a replacement for it?
- What 'value added' does ILT bring to the learning process?
- How can this added value be measured?
- What effect does it have on the individual?
- Should we try to adapt ILT to the existing education/training framework or develop a totally new one for future societies?
- Using ILT, can we develop learning materials that will produce holistic learners (individuals that can adapt to all learning/training environments)?
- Can we use ILT to develop systems that lead the learner through all stages of the Kolb learning cycle?
- How do we develop learning environments that develop the full potential of individual learners?
- How do we ensure that learning styles are used to empower people not to categorise them?

- What definition of learning can be used in a modern learning society?
- Can the same definition be applied to academic education and training?
- Should the needs and aspirations of society dictate the individual learning process?
- Can ILT be used to support the learning process at all levels?
- How do we help learners to recognise good and bad learning experiences?
- What training should we provide to learners using multimedia, flexible and open learning environments and materials?
- How do we identify the learner's past experience and develop individual learning programmes?
- How can ILT be used to enhance the learning experience?
- How can we use the Kolb learning by doing model to evaluate the effectiveness of learning assignments and materials?
- How can we use it to evaluate the learning experience?
- How can we adapt the model to a modern learning society?
- How can we integrate ILT into this process?
- How can ILT be used to improve communications?

- How can we use ILT to produce learners confident in a range of learning styles?
- What are the problems associated with a predominant learning style?
- How can ILT be used to overcome some of these problems?
- How do we use ILT to ensure consistent results in a range of learning environments?
- Multimedia material spans all of the learning styles: is this the reason why it is being accepted more quickly than was the case with older technologies?
- Why is it important to recognise the preferred learning style of the designer of multimedia learning material?
- How can we control the introduction of new technology within an education framework?
- Will interconnectivity be the answer to the regeneration of local economies?

National level:

- The quality of learning in education, industry and commerce influences the social and economic success of the nation.
- To ensure national prosperity, a learning society in which everyone continues their education and training throughout life needs to be developed.
- The increased significance of accredited learning is demonstrated by major curriculum changes such as... National Vocational Qualifications (NVQ) and General National Vocational Qualifications (GNVQ).

Institutional level:

- The notion of learning in organisations is emerging as a key idea.
- All members of the organisation ... make a commitment to constant improvement and lifelong learning.
- Changes in systems, standards and practices such as Investors in People, college charters, the Management Charter Initiative, flexible colleges and learning partnerships between organisations demonstrate the focus on learning at an institutional level.

Team level:

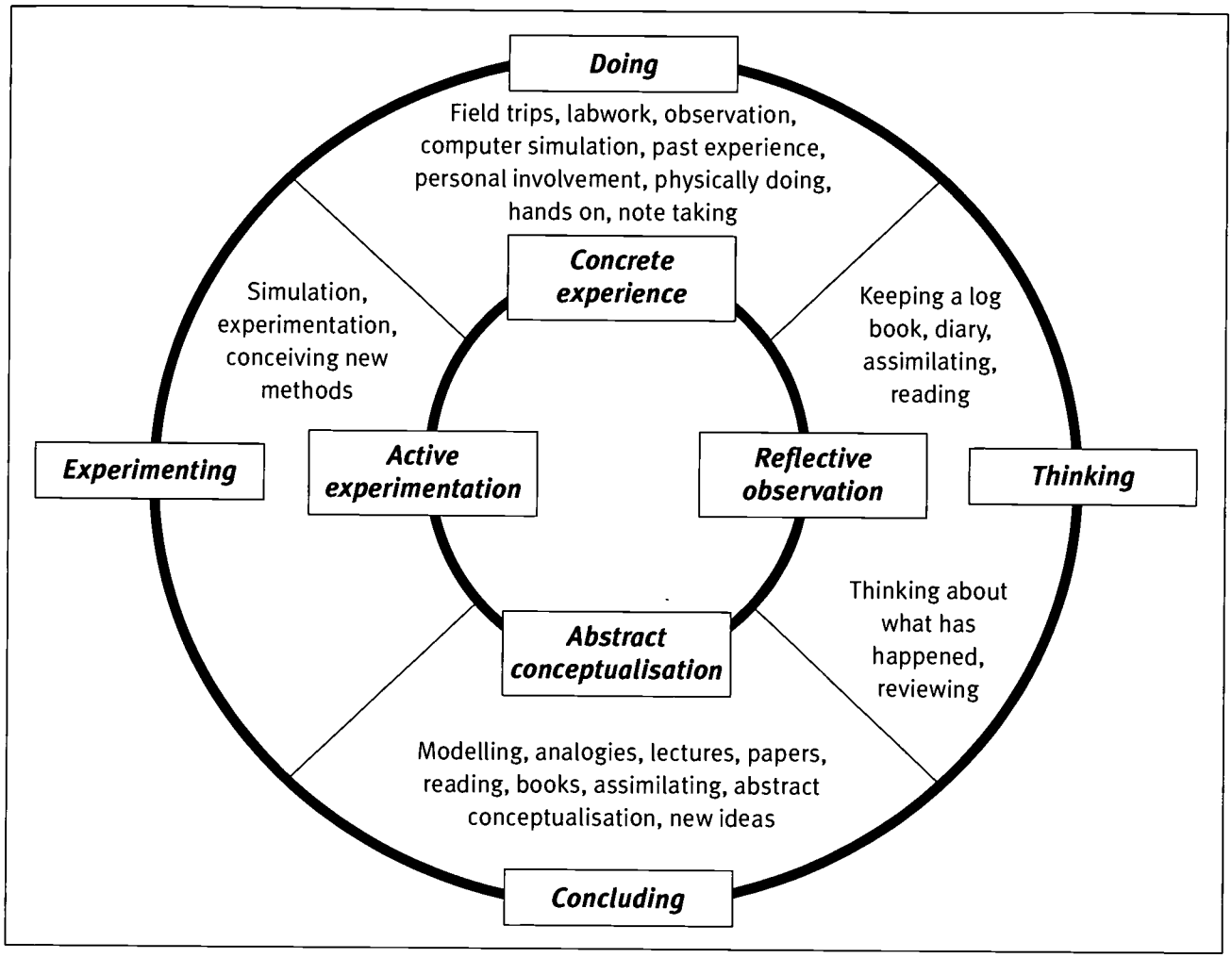
- Teams are made up of individuals who have complementary rather than contrary talents.
- Teams themselves go through different stages and styles of learning.
- The significance of learning at a team level is demonstrated by the increased empowerment of course and programme teams in colleges.

Individual level:

- There is an increasing recognition of the need for people to take responsibility for their own learning.
- Only when the individual has acquired the skills of self-organisation will they be equipped to fit into learning organisations within the learning society, and make a commitment to lifelong learning.

Learning styles, FEDA, 1995

3 Kolb in context



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Computer-assisted training	Computer-based training	Computer-based training
Computer-based training	E-mail	Digital television
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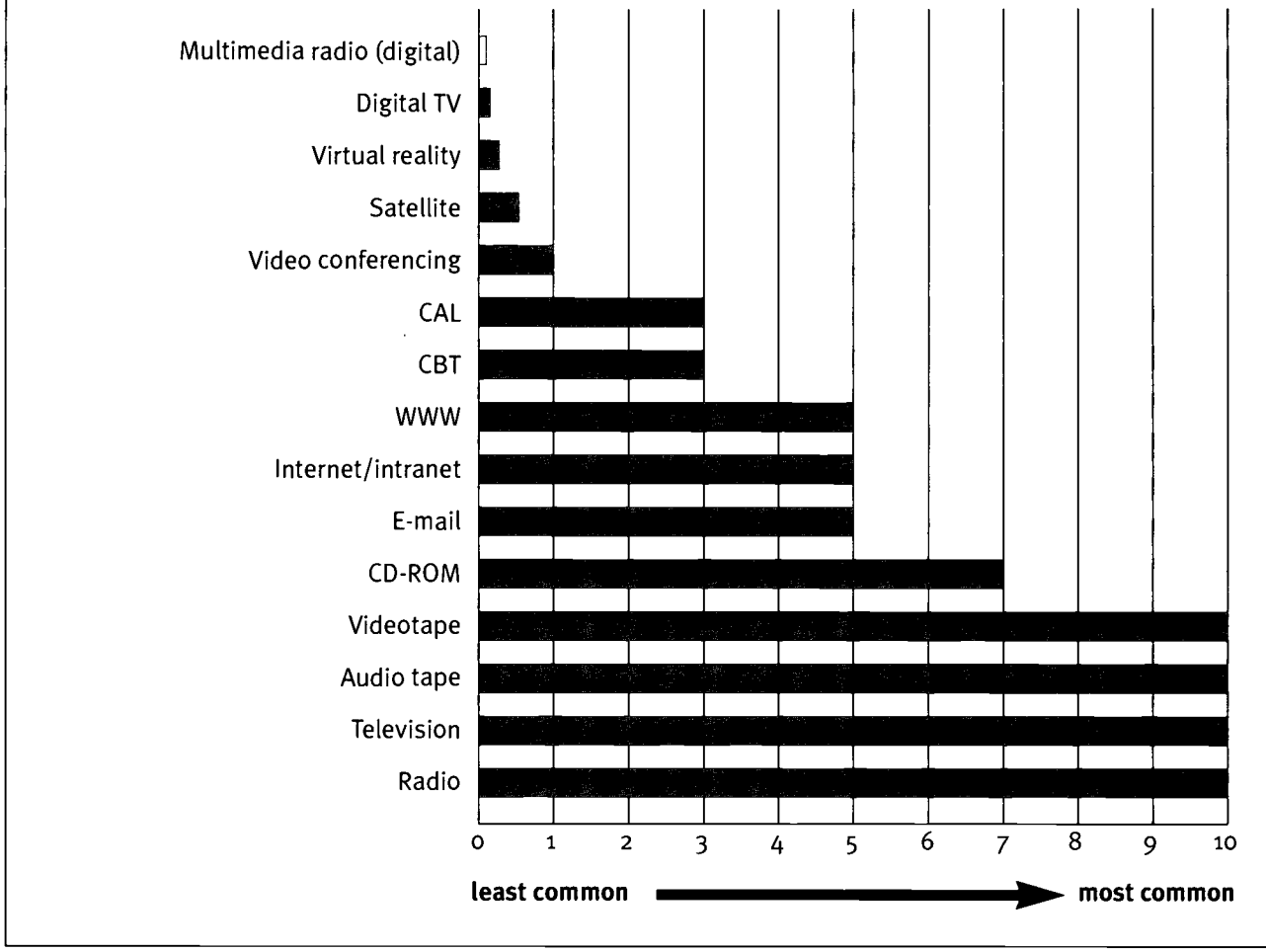
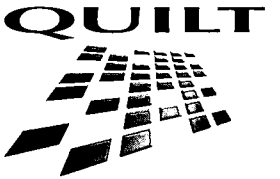
Discussion	Multimedia radio (digital)	Internet/Intranet
Internet/intranet	OHTs	Labwork
Lectures	Photographs	Multimedia radio (digital)
Multimedia radio (digital)	Printed material	Satellite
Radio	Satellite	Videoconferencing
Videoconferencing	Television	Virtual reality
	Videoconferencing	WWW
	Video tape	
	Virtual reality	
	WWW	

Figure 8 Resource availability



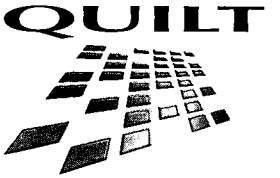
OHT index

1 Critical questions



1. *How is computing (ILT) changing the work patterns and the organisation of social institutions?*
2. *How can computers (ILT) be used to achieve present educational goals?*
3. *How will present educational goals change to accommodate changes in the nature of work due to the widespread use of computers and other information technology?*
4. *How will computers (ILT) change our notion of what we mean by communication, information processing, language, learning, education and work?*

1 *Critical questions* continued



5 *How can the school (educational/training) system be restructured so that the goals of education and the vocational needs of society in the information age be better matched?*

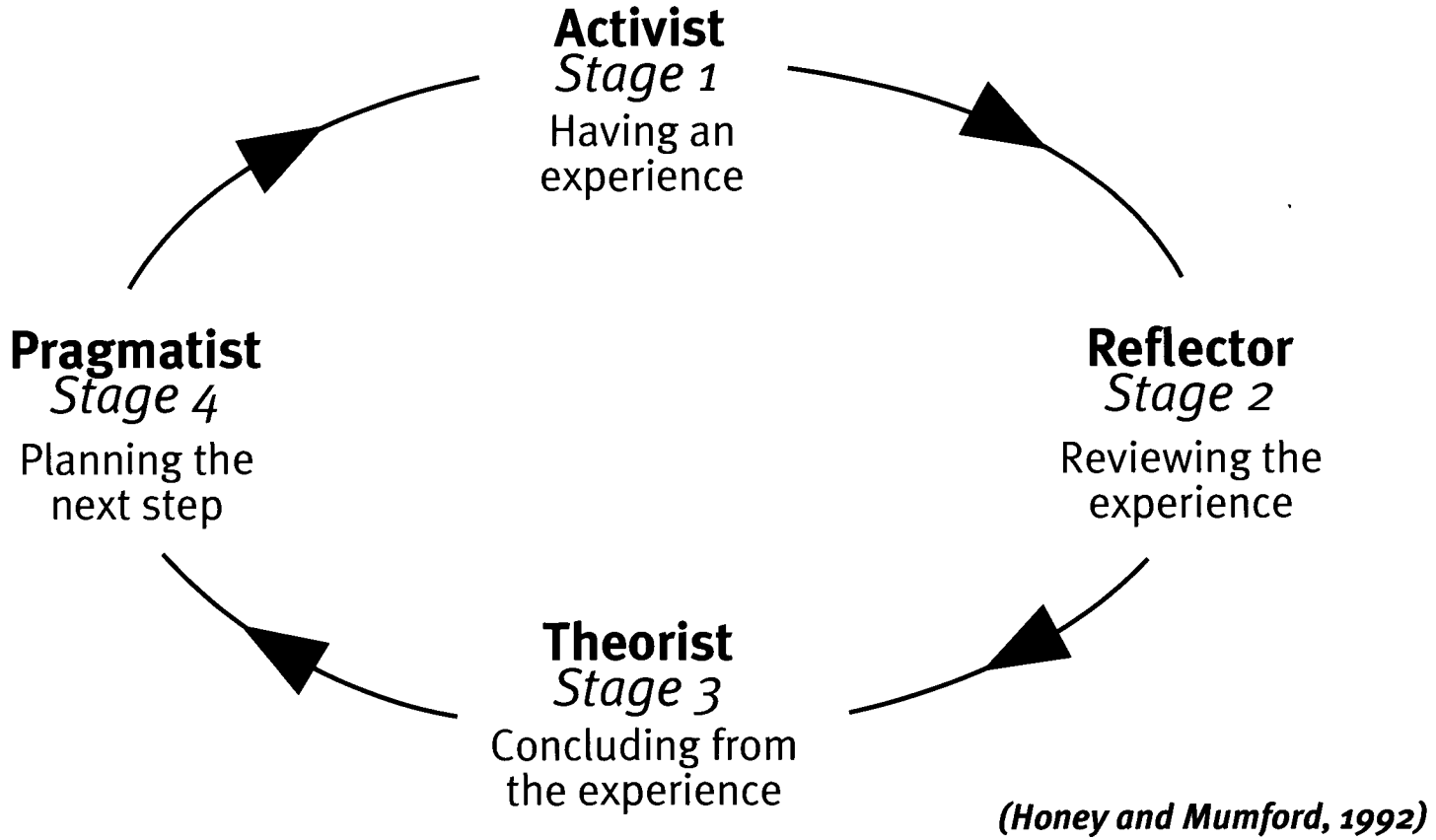
6 *How can computing (ILT) be harnessed to inculcate students with the desire for lifelong learning?*

7 *How can work be organised to promote learning naturally?*

8 *How can education in the workplace be better organised to improve productivity so that learning becomes a lifelong activity and workers are properly trained to do their jobs?*

(The fifth language, Logan, 1995)

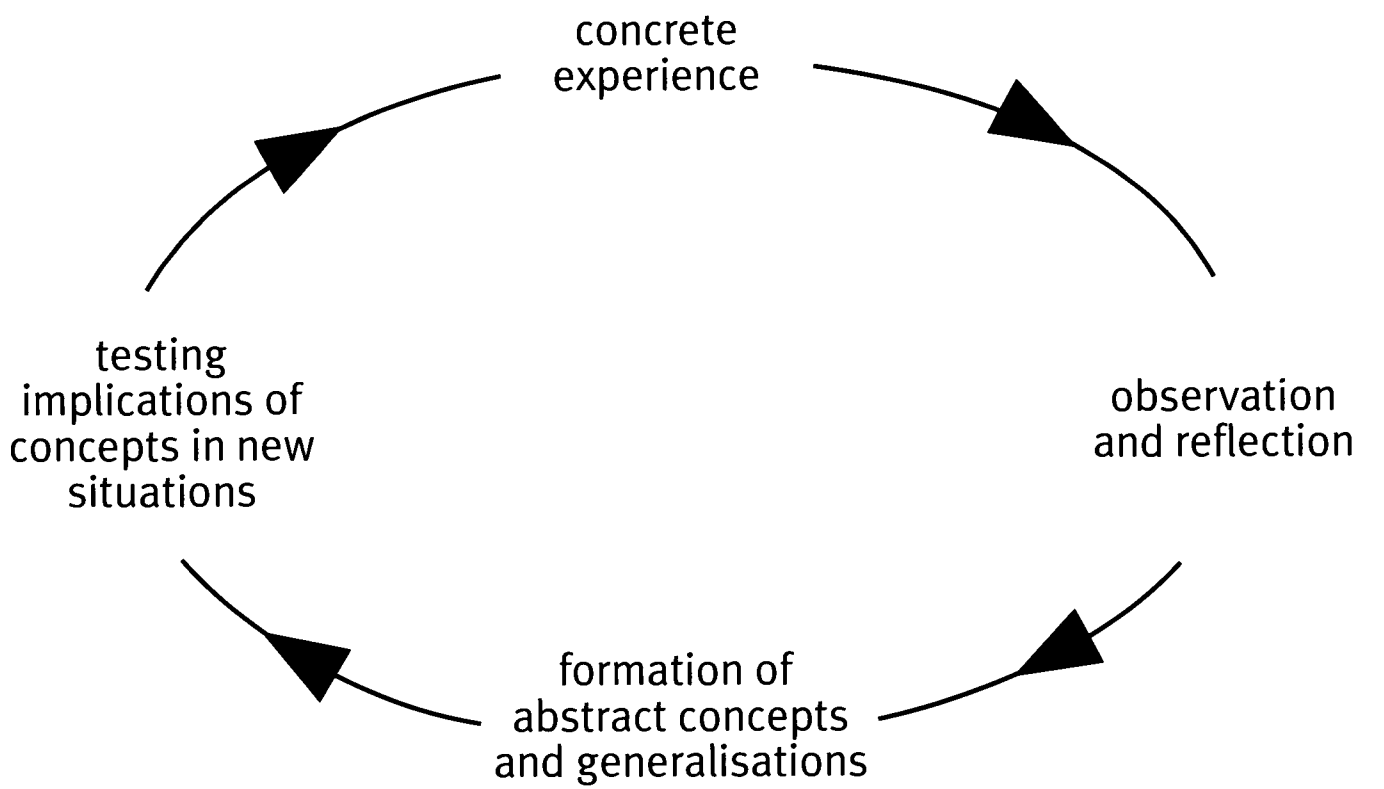
2 Honey and Mumford's learning cycle and learning styles



(Honey and Mumford, 1992)

 QUILT *Learning styles* ***Ref. 1 Understanding learning styles***

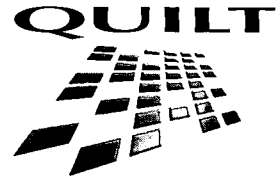
3 Kolb's learning cycle



(Kolb, 1984)

 QUILT *Learning styles* ***Ref. 1 Understanding learning styles***

4 *Learner's contribution to the learning process*



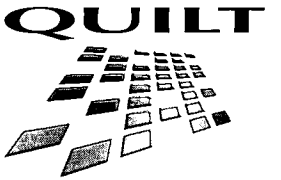
a What do learners contribute to the learning process?

- *Past experience*
- *Individual perception*
- *New ways of thinking*
- *New concepts*
- *Energy and enthusiasm*

b How can teachers/lecturers help the learner?

- *Build on learner's past experience*
- *Make the learning relevant to the individual*
- *Identify learner's preferred learning style*
- *Highlight new ways of learning/studying*
- *Motivate the learner*

4 Learner's contribution to the learning process *continued*



c Kolb learning by doing model

- *Concrete experience*
- *Reflective observation*
- *Abstract conceptualisation*
- *Active experimentation*
- *What this means to the learning process*

d Encouraging the preferred learning style

- *Doing*
- *Thinking*
- *Concluding*
- *Experimenting*
- *Identifying learning activities for each area of the Kolb model*

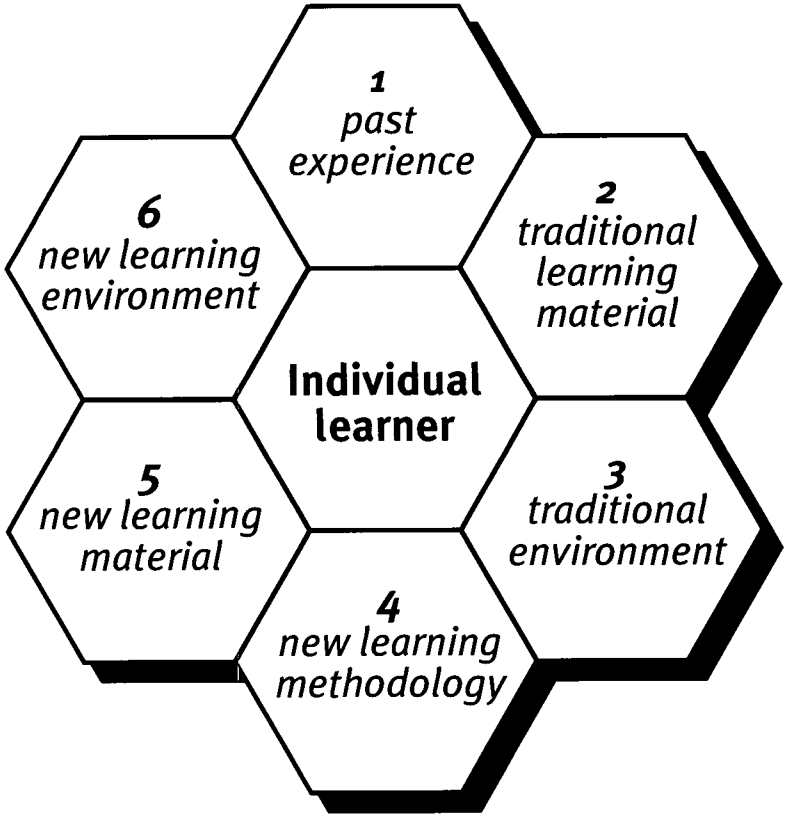
4 *Learner's contribution to the learning process* continued

e Essentials of effective communications

- *Information must be meaningful and relevant*
- *Method of communication must be clear*
- *Information must relate to the experience of the learner*
- *Learner must be given time to assimilate the information*

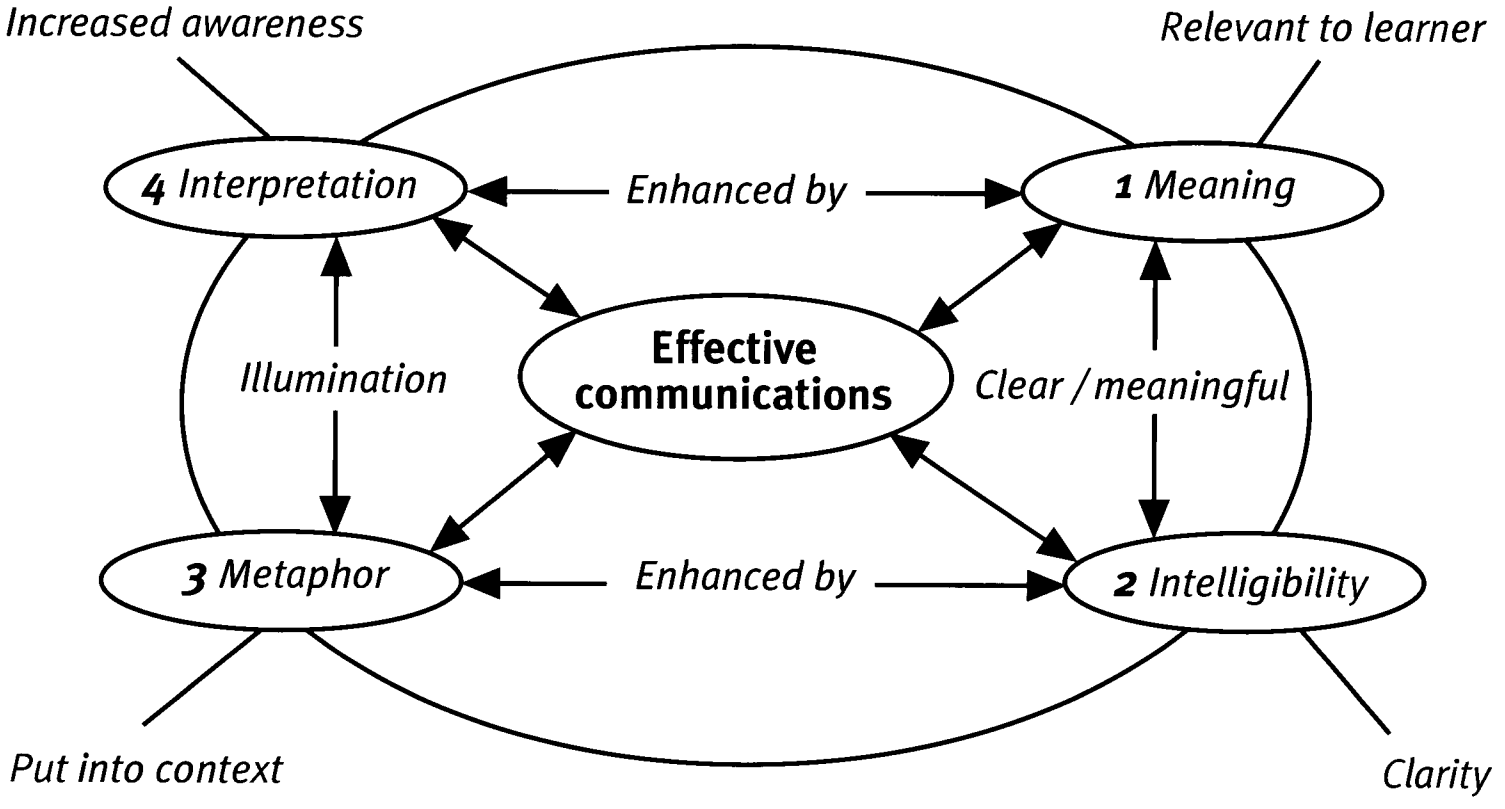
 QUILT *Learning styles* ***Ref. 2 Unlocking the potential of ILT***

5 Individual's contribution



 QUILT Learning styles **Ref. 2 Unlocking the potential of ILT**

6 Essentials of effective communications



 QUILT Learning styles **Ref. 2 Unlocking the potential of ILT**

7 Environmental identification model

Method	Tutor	Learner environment
• classroom • lecture • meetings	Tutor and learner in the same place at the same time	Timetabled environment; classroom or lecture-based
• flexible • open learning • drop in • assignment-based	Tutor and learner in the same place but at a different time	Flexible/open learning environment
• video-conferencing • telephone • e-mail • WWW	Tutor and learner in a different place at the same time	Flexible/open learning and ILT environment
• Internet • WWW • e-mail • fax • post	Tutor and learner in a different place at a different time	Virtual learning environment

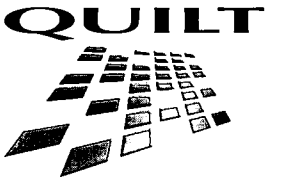
 QUILT Learning styles *Ref. 3 Learning resources and environments*

8 Staff development activities

Critical questions

- *Discuss the eight critical questions with colleagues and produce three answers for each question.*
- *Apply the eight questions to a particular curriculum area; use the answers from the first task to produce a framework for ILT development.*

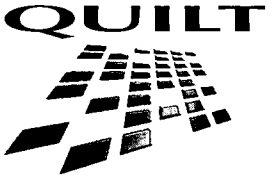
8 Staff development activities *continued*



Honey and Mumford

- *Ask each member of staff to produce a short learning assignment, based on their own curriculum specialism, which takes the learner through the four stages of the Honey and Mumford learning cycle.*
- *Discuss the possible uses of ILT to improve this learning experience. Focus on:*
  - *what would be used*
  - *why it would be used*
  - *how it would be used*
  - *where it would be used*
  - *when it would be used.*

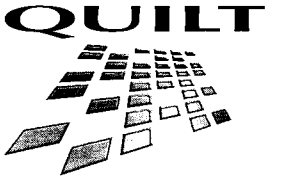
8 *Staff development activities* *continued*



Evaluating the learning process

- *Identify criteria that could be used to evaluate the learning process.*
- *Are the criteria you have identified relevant to both academic and vocational education/learning?*
- *If there are differences, what are they?*
- *Produce a list of performance criteria that is relevant to both academic and vocational education.*
- *Discuss the potential role of ILT within this evaluation.*

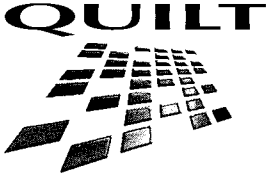
8 Staff development activities *continued*



Learning experience

- *Identify the elements that individuals bring to the learning process.*
- *Identify the barriers which may affect the individual learning process.*
- *List the advantages and disadvantages of traditional learning methodologies.*
- *List the advantages and disadvantages of new learning delivery methodologies.*
- *Devise a learning experience, using ILT, that will take the learner through all four areas of the Kolb learning by doing model.*

8 *Staff development activities* *continued*

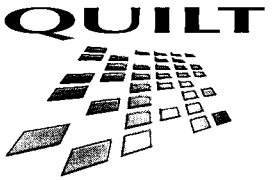


Effective communications

- *How can ILT be used to improve communications?*
- *Discuss the types of resources you consider would be most effective.*
- *List the advantages the identified resources would bring to the learning experience.*

 QUILT *Learning styles* ***Ref. 2 Unlocking the potential of ILT***

8 Staff development activities *continued*



Developing individual learning and assessment

- *Discuss the advantages and disadvantages of a predominant learning style.*
- *How can we use ILT to help learners to develop confidence in using a range of learning styles?*
- *What criteria can be used to assess the effectiveness of individual learning outcomes within a range of education environments?*
- *What part can ILT play in the assessment process?*

8 Staff development activities *continued*

Identifying the benefits of new technology

- *In small groups, identify an area of new technology you feel would be of benefit to your institution. Discuss the reasons for your selection and identify the benefits to the:*
  - *tutor/trainer*
  - *organisation*
  - *student*

ILT strategic planning

- *Ask colleagues to fill in the ILT strategic planning tool in Appendix 3.*
- *Discuss any issues highlighted. List the main points.*
- *Discuss areas of good practice. List the main points.*
- *Identify key points for ILT strategic development.*

APPENDIX 3: INTEGRATING ILT IN LIBRARIES, FLEXIBLE AND OPEN LEARNING CENTRES

Shade up to the box you have ticked. Once complete, turn the sheet on end to reveal a bar chart indicating your view of your college's strengths and weaknesses.

	Evolutionary		***Transitional***	***Revolutionary***	
	localised	**co-ordinated**	**transformative**	**embedded**	**innovative**
Does college management understand and have a strategic approach to the integration of ILT?					
Has the college developed a strategic ILT plan?					
Has a funding methodology been identified?					
Does the strategic plan include the development of flexible/open learning?					
Is ILT integrated into any areas of the college curriculum?					
Has the college identified staff training requirements?					
Has the college developed a comprehensive staff development programme?					

	Evolutionary		*Transitional*	*Revolutionary*	
	localised	**co-ordinated**	**transformative**	**embedded**	**innovative**
Does this staff development pro-gramme address the 'real' needs of staff?					
Is staff development related to nationally-recognised qualifications?					
Is access to learning resources freely available?					
Has the college developed a flexible staffing methodology?					
Has the college identified the ILT needs of the learners?					
Has a learner ILT training programme been devised?					
Are systems in place for identifying, selecting and implementing ILT-based learning material?					
Has the college developed quality indicators in relation to flexible and open learning?					
Has the college developed a funding methodology for supporting flexible and open learning?					

QUILT

An understanding of learning styles is crucial to helping individuals reach their potential. This publication takes a key model on learning styles and uses it to show how to make use of information learning technologies (ILT) in this context and match resources to different styles. It includes staff development activities and OHTs to provide a practical approach to integrating ILT within flexible learning environments, based on an understanding of learning styles.

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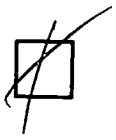

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