Module 4: Pedagogical Approaches
Further information

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List of Abbreviations

ARCS – Attention, Relevance, Confidence, Satisfaction
BUSI – Build Up Skills Ireland
COP - Communities of Practice
DCENR - Department of Communications, Energy and Natural Resources
DECLG - Department of the Environment, Community and Local Government
DoES – Department of Education and Skills
EC – European Commission
ECTS - European Credit Transfer and Accumulation System
EGFSN - Expert Group on Future Skills Needs
EHEA - The European Higher Education Area
ETCI – Electro-Technical Council of Ireland
EU – European Union
FES – Foundation Energy Skills
FETAC - Further Education and Training Awards Council
HETAC - Higher Education and Training Awards Council
IoTs – Institutes of Technology
NFQ - National Framework of Qualifications
NSAI - National Standards Authority of Ireland
OFSTED – Office for Standards in Education, Children Services and Skills
QQI - Quality and Qualifications Ireland
SBS – Standards Based System (Apprenticeship)
SEAI – Sustainable Energy Authority Ireland
SLMRU - Skills and Labour Market Research Unit
SME - Small and Medium Enterprise
SSC – Sector Skills Councils
VEC - Vocational Education Committee
VARK – Visual, Auditory, Reading and Kinaesthetic
VET - Vocational education and training
VLE - Virtual Learning Environment
ZPD – Zone of Proximal Development
Module Description

Since 2002, a number of EU policy directives have focused on reducing energy consumption in buildings and have led to a series of revisions to Irish Building Regulations (BUSI, 2012). Irish building standards for dwellings have now evolved to the extent that all new builds are effectively low energy buildings (equivalent to an A3 Building Energy Rating) and similar standards apply to large scale renovation and extension projects.

In 2012, the EU funded Build UP Skills Ireland Project (BUSI) undertook a skills gap analysis of the construction sector in relation to the implementation of low energy buildings. A key conclusion of this gap analysis was that all building construction workers require some level of training on the underpinning principles of low energy buildings. The gap that was identified was one of knowledge, rather than core technical skills, and the need for attitudinal change in the Irish construction industry. Low energy buildings require close attention to detail and specification along with a collaborative approach by all involved in the construction process. This is inconsistent with the traditional ethos of the sector.

The BUSI project produced a national Roadmap outlining training and supporting actions to address the gaps in the knowledge and skills of building construction workers. As a first step, the roadmap recommended the development and delivery of a Foundation Energy Skills (FES) training programme for all workers. QualiBuild, the follow-on project from BUSI, has developed this training with a view to delivery as a national pilot scheme. The aim of the programme is to increase the learner’s knowledge of principles and practices applied to the construction/retrofitting of low energy/near zero buildings. This improved knowledge will allow such workers apply their existing skills so that relevant energy efficient standards are achieved.

The FES programme is also intended as an awareness raising exercise, emphasising the need for collaboration onsite between personnel, i.e. a ‘systems thinking’ approach, which is required for successful implementation of low energy buildings. It will also challenge existing attitudes and culture of building workers by highlighting the relationship between quality in workmanship and the achievement of standards.

The training of construction workers in Ireland traditionally follows a typically behaviourist approach to learning, i.e. behaviours can be measured, trained and changed. A number of skills are taught onsite through informal instruction and experiential learning. For formal skills training, a standards based system (SBS) of
The apprenticeship is currently in operation, officially introduced in 1994 to replace an existing time served model.

For the FES programme, the challenge is to address both technical knowledge gaps and attitudinal change. This will require a shift from traditional models of construction training towards a more learner centred approach, emphasising learning outcomes beyond the acquisition of technical skills and competencies and into shared knowledge and experiences in communities of practice.

This is the fourth and final module of the Certificate in Training in Low Energy Buildings programme (Figure 0.1). It is intended to build on the learning from the previous contextual and technical modules by preparing trainers for the specific delivery methodologies to be used under the FES programme.

Figure 0.1: Programme Structure

The aim of this module is to enhance the learner’s current knowledge and skill as a trainer, to facilitate effective delivery of course content in Low Energy Buildings by Blended Learning. It covers techniques in lesson planning and design of activities that accommodate different learning styles geared to enhancing learner participation.

For you as a trainer, it is fundamental that you are fully aware of this context if you are to influence the attitudes and behaviours of your learners to adopt a new culture and approach in their work.
Module Aims

This module aims to provide you with knowledge of:

- The main learning theories which underpin the functions and processes of learning and training.
- A range of learning styles and their implications for the training of construction workers.
- Stages of group development, group dynamics and how they impact on the design and management of group learning activities.
- A variety of training aids and technologies which may be used to enhance training events.
- Delivery methods that may be deployed for the achievement of cognitive and attitude related learning outcomes.
- The purpose and principles of assessment and a number of methods that may be employed to assess your learners.

Module Overview

The module is divided into three units, each consisting of two sections as outlined in Figure 0.2.

![Module Structure Diagram](image)

Figure 0.2: Module Structure
Unit 1: Learning Theory

Section 1 (Models of Learning): This section considers the established models of learning, including behaviourism, cognitivism and constructivism.

Section 2 (Learning Styles): Explores learning preferences or styles and their implications in instructional design.

Unit 2: VET Contexts & Settings

Section 1 (Vocational Learners): This section considers the contexts and settings specific to vocational learners and explores the approach of the FES programme to training for attitude change.

Section 2 (Learning in Groups): In this section you will learn about group development and techniques for designing and implementing group learning activities.

Unit 3: Teaching & Assessment Methods

Section 1 (Content Delivery Methods): This section considers the selection of appropriate methods of course delivery for FES training.

Section 2 (Assessment Methods): covers the purpose of assessment and the principles on which fair and reliable assessments are based

Module Learning Outcomes

On successful completion of this module you will be able to:

1. Describe a range of learning styles and outline the factors that affect learner motivation.
2. Apply instructional design theory and techniques to develop a lesson plan.
3. Describe the stages of group development.
4. Design, implement and manage group activities.
5. Select the appropriate training methods to achieve different learning objectives.
6. List and describe the principles of and methods of assessment appropriate for different types of learning outcomes.

Tips for Using the Module Manual

You are expected to read the module manual before you attend the workshop. This is necessary to provide you with the best opportunity for learning at both workshops.
Module assignments and activities will be based on the content of the manual. The following approach is recommended:

- Work through the module material sequentially as the order is important.
- Complete the activities and progress checks for each unit.
- Take note of summaries, key points and additional reading references, they are designed to help you identify the key information.
- If something is unclear to you or you require clarification take note of it, you will have an opportunity to discuss with your tutor at workshops.
- A list of definitions is provided at the beginning of the manual for reference as you work through the units and sections.

**Legend for Icons**

The following icons are used to highlight sections of the module:

- **Learning outcomes**
  At the beginning of each unit and section

- **Key learning point**
  Highlighting main points in text

- **Activity**
  Where you are asked to complete an exercise to explore a topic further

- **Progress Check**
  At the end of each section to allow you to assess your own progress

- **Summary**
  At the end of each section summing up the main points
Unit 1: Learning Theory

Rapid changes are taking place in the construction industry which are having an impact on Vocational Education and Training (VET). These changes include, for example, the introduction of construction techniques to reduce energy consumption of new buildings (low energy) and integration of a variety of renewable technologies. In a domestic dwelling. A coordinated and interdependent nature required to professionally incorporate these new advances places a much greater emphasis on ‘generic’, ‘soft’ or ‘behavioural’ skill. The concept of skill that has underpinned much of VET provision has broadened considerably with a need to incorporate these ‘soft skills’ within a VET pedagogy.

Pedagogy is the science and art of education; it is the study and practice of how best to teach, especially as an academic subject or theoretical concept. (Smith, 2012)

The recognised view of vocational pedagogy, ‘the science, art, and craft of teaching’ is broadening to take account of these changing circumstances. It now includes the decisions which are taken in the creation of the broader learning culture in which the teaching takes place, and the values which inform all interactions.

The purpose of this module is to describe established learning theories and models with a view to explain their impact on the delivery of the Foundation Energy Skills training

Section 1 considers the established models of learning, including an investigation of behaviourism, cognitivism and constructivism.

Section 2 explores learning preferences or styles and their implications on delivery of content.

After completing this unit, you will be able to:

1. Describe behaviourism, cognitivism and constructivism, and their implication for the design and delivery of learning.

2. Select and apply the appropriate or optimal content delivery approach based on specific requirements for learning.

3. List and describe learning styles and their implications on delivery of content.
Unit 1 Section 1
Models of Learning
1.1 Introduction

There have been many attempts to define how people learn, but to date there is no universal agreement. There are over 50 different theories on learning, take a look at [http://tip.psychology.org/theories.html](http://tip.psychology.org/theories.html) but be prepared to read! Even with all of these learning theories, if we were to ask instructors which model or theories they base their teaching practice on, they might struggle to answer. This is true not only for instructors in the vocational education and training sector, but for universities as well. For example, Murray and Macdonald (1997) report that many university lecturers rely on their tacit knowledge (e.g. common sense) but cannot articulate the educational theory foundations for their teaching practice.

At the end of this section you will be able to:

1. Distinguish between the different learning theories.
2. Identify the key requirements for delivery for the three main theories.
3. Analyse the appropriate learning theory for a particular learning situation.
1.2 Learning Theories

What are Learning Theories?

The term "learning" can be defined differently depending on many factors such as the learner’s perspective, facilitator’s beliefs or the situational context. As understanding on how learners learn has developed, learning theories have attempted to conceptualise this new understanding. (Sawyer, 2006)

Learning theory is defined for the purpose of this document as the theory or study of how people learn. It is divided into three main categories: behaviourism, cognitivism, and constructivism.

Behaviourism

The principal claim of behaviourism states that people learn through conditioning.

Conditioning is a change of behaviour realised through action and response type exercises. This can be in formal ways such as within the school environment or informal such as how we respond to pain or pleasure.

Learning is the development of new behaviour through this conditioning that requires no inner mental processing. The three major proponents of behaviourism were Pavlov (1920), Watson (1924), and Skinner (1938). Pavlov developed the theory of ‘conditioned reflex’ also known as classical conditioning. This theory was experimentally shown by the linking of two actions to a response. After a certain time when one action is presented the response will occur. This was demonstrated in his well-known experiment where in response to a certain sound, that had earlier been associated with feeding, a dog would begin to salivate.
While Pavlov was interested in conditioned responses in animals, Watson (1924) attributed all human behaviour to conditioning and showed how complex emotions like fear could be conditioned in a person. In his famous 'Little Albert' experiment he showed how fear, a non-physical reaction, could be linked to an object that was previously viewed as neutral. This was accomplished in a still controversial experiment where he scared a young boy by associating a fear with a neutral object. When later shown the object, the child was seen to be conditioned to be fearful.

Skinner (1938) is credited with the development of radical behaviourism, which believes that voluntary human and animal behaviour can be conditioned. This differs from Pavlov and Watson, who were studying involuntary behaviour.

**Behaviourism’s key principles**

In terms of learning, four key behaviorism principles come to the fore (Hartley, 1998)

1. **Activity is important** - Learning is more effective when the learner is active rather than passive. Therefore, where appropriate, 'learning by doing' is most effective.

2. **Repetition, generalisation and discrimination are important notions** - Frequent practice - and practice in varied contexts - is necessary for learning to take place. Skills are acquired by frequent practice.

3. **Reinforcement is the cardinal motivator** - Positive reinforcement like rewards and successes are preferable to negative events like punishments and failures.

4. **Learning is helped when objectives are clear** - Those who look to behaviourism in teaching will generally frame their activities by behavioral objectives e.g. 'At the end of this session participants will be able to...' With this comes a concern with competencies and product approaches to curriculum.
**Behaviourism’s key considerations for delivery**

There are some key considerations when planning to deliver course content using the behaviorist approach. They include:

- List the expected learning outcomes.
- Assessment must be based on the expected learning outcomes.
- Break the material down into manageable units.
- Carefully sequence these units according to the desired learning.
- Present the rules for learning the topic.
- Ensure that the learner actively responds (engagement and interactivity).
- Provide opportunities for frequent learner feedback.
- Reinforce correct behaviour with immediate rewards (positive reinforcement).

Source: Carlile et al. (2004)

**Cognitivism**

Cognitivism theory is based on an investigation of human thought processes. It developed from Miller’s experimental work carried out on memory, perception and attention. Some of the work on artificial intelligence and the attempt to have computers replicate mental process also contributed to Cognitivist thinking.

Cognitivists focus on the ways that learners gain and organise their knowledge and they have developed ‘information processing input-output’ models of learning.

Figure 1.1 illustrates the way that sensory input may be processed through short-term memory, and organised or ‘encoded’ before being lodged in long-term memory (learning takes place).
Many current ideas intended to facilitate student learning draw on our awareness of the mental processing outlined above. The concept of ‘Mind-mapping’ as a form of effective note-taking developed by Buzan (1974) draws both on concepts of encoding and those of dual coding, i.e., presenting material in more than one medium to increase learner retention. Work carried out on levels or types of learning also draws on our knowledge of short and long-term memory stores.

There are two types of learners identified in the theory of cognitivism – ‘surface learners’ who try (and generally fail) to retain the material held in short term memory because of information-overload, and ‘deep learners’ who attempt to understand and encode material so that it can be transferred to long-term memory and more effectively learnt.
The most well-known proponents of Cognitivism were Piaget and Inhelder (1969). They argued that knowledge is acquired by the natural development of mental structures as a child responds to experience. The concept of ‘readiness’ is therefore important in order for the learner (child in this case) to move on to the next stage of conceptual development.

For Cognitivists, learning process involves developing strategies for thinking. However, like Behaviourists, they still place the teacher or curriculum designer firmly in control. You need a knowledge of mental processing or of how to produce the desired behaviour in order to reinforce or direct learning, but it is still your responsibility to control it. As a subject specialist you will want your learners to adopt particular strategies that are effective in your domain.

For example the cognitivist vocational education/training instructors would not be very concerned with the answer to a problem, rather their focus would be on the cognitive strategies needed to arrive at the solution.

As the learner progresses through the educational system, i.e., from primary, to secondary, to higher educational levels, the pedagogical approach becomes more Cognitive. At primary level there is an emphasis on the acquisition of facts (Bruner 1996), whereas at higher levels there is an emphasis on general principles, methods and ways of knowing. This is also shown in assessment procedures and examinations where lower level papers ask for description and reproduction of facts whereas higher level papers require analysis, discussion and debate (more to read about in Bloom’s taxonomy)

**Cognitivism’s key principles**

Hartley (1998) has also defined six key principles of cognitive learning. The principles he identifies are:

1. **Instruction should be well-organised** - Well-organised materials are easier to learn and to remember.
2. **Instruction should be clearly structured** - Subject matters are said to have inherent structures – logical relationships between key ideas and concepts – which link the parts together.
3. **The perceptual features of the task are important** - Learners attend selectively to different aspects of the environment. Thus, the way a problem is displayed is important if learners are to understand it.
4. **Prior knowledge is important** - Things must fit with what is already known if it is to be learnt.

5. **Differences between individuals are important as they will affect learning** - Differences in 'cognitive style' or methods of approach influence learning.

6. **Cognitive feedback gives information to learners about their success or failure concerning the task at hand** - Reinforcement can come through giving information – a 'knowledge of results' – rather than simply a reward.

**Cognitivism's key consideration for course delivery**

There are some key implication if planning to deliver with a Cognitivist approach, they include:

- Promote active listening.
- Don't present too much material at once to avoid overload of learner’s short term memory.
- Don't lecture for more than twenty minutes without a break.
- Divide the course material into groups or categories to facilitate retention.
- Make the structure and patterning of the material explicit for learners.
- Present material in more than one form to facilitate transfer to long term memory.
- Give learners the opportunity to revisit content fundamentals to strengthen retention.
- Use key words and terms as memory cues.

**Constructivism**

Constructivism is the theory that people construct their own view of the world based on experience and their own understanding. Each person has his/her own mental image of the world they exist in and learn through experience and processing of their experiences.
This is clearly differentiated from Behaviourism by its emphasis on the importance of mental processing. Early constructivism can be traced to Giambattista Vico in the 18th century, who believed that people could only truly understand what they themselves had constructed. He felt that truth is verified through creation not observation, ‘The criterion and rule of the true is to have made it.’ (Costelloe, 2014) Later proponents of constructivism include Piaget and Dewey.

Piaget (1969) developed the theory of stages of cognitive development. He believed that children went through four stages of learning, each based on the one that came before. As each stage was mastered and internalised, the developing mind would gain greater complexity and move on to the next, more complex stage.

As a psychologist and educational reformer Dewey (1916) promoted experimentation, problem solving and critical thinking as integral components of learning. Dewey’s ideas were also referred to as pragmatism.

Social Constructivism

Constructivism is further developed by Social Constructivists who examine the interpersonal interactions and social – cultural context in learning and how this impacts on the construction of knowledge.

The research of the Russian psychologist Vygotsky (1987) demonstrated the importance of others as learning mediators, he showed that without communication, there can be no thought. Vygotsky believed that thinking does not exist independently of the world, nor of other people. He states that a certain amount of material can be learnt by a student on their own, however, though with the help of the instructor more can be learnt.

The instructor can recognise the stage the student is presently at, and offer suitable material, encouragement and prompts to allow them to move to the next level. The idea is that the learning environment (including the instructor) provides ‘scaffolding’ or support to help learners to achieve a higher level, while gradually withdrawing this support so that the learner becomes more independent. An instructor should help learners to internalise external knowledge and make it their own.
Seven Key Principles of Constructivism

Seven principles for designing course delivery methods to support learning based on constructivism are:

1. **Learning vs. Teaching**
   - Put the emphasis on learning and deemphasize teaching.
   - For example, teacher/computer questions are discouraged and learner questions are encouraged.

2. **Discovery Learning**
   - Emphasizes the learner exploring, experimenting, doing research, asking questions and seeking answers.

3. **Construction**
   - Some environments are designed with learner construction in mind
     - Construction of simulations.
     - Construction of essays or news-papers.
     - Construction of video stories.

4. **Situated Learning and Anchored Instruction**
   - Situated learning is the theory that learning always occurs in some context, and the content in turn affects learning.
   - The anchored instruction approach involves the notion that a learning environment should be embedded in a real world content (e.g. Project Maths\(^1\)).

5. **Cooperative and Collaborative Learning**
   - Cooperative means learners helping each other rather than hindering, competing or ignoring one another. Usually work on individual projects but assist each other.
   - Collaborative learning goes a bit further, suggesting environments in which learners work on a shared project or goal.

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\(^1\) [http://www.projectmaths.ie/](http://www.projectmaths.ie/)
• May not suit all learners.

6. Autonomy Choice and Negotiation

• Learners should be given choices and the opportunity to be more autonomous in their actions.
• Learners and instructors should negotiate and jointly decide goals and activities.
• As a result, goals and activities may become more meaningful to learners.

7. Reflection and Strategic Thinking

• People should be lifelong learners.
• An educational environment should foster not only learning of content but of learning how to learn.
• Learners should have opportunities for strategic thinking, planning how to achieve learning goals etc.

Constructivism's key considerations for content delivery

There are some key considerations when planning to deliver course contents using the Constructivist approach to support learning. They include:

• Encourage team working and collaboration by learners.
• Promote discussion - even in lectures.
• Involve learners in project work.
• Allocate a small proportion of grades to peer assessment after training learners in the criteria and process.
• The instructor’s role is the model of ‘the way things are done around here’.
• Know learners as people, and develop relationships and build trust.
• Be emotionally aware.
• Be explicit about your professional values and the ethical dimensions of your subject.
1.3 Context in Vocational Education and Training

How do these learning theories be adapted for VET scenarios?

Constructivist learning theories adopt a more learner-centred approach to pedagogical practice than either behaviourism or cognitivism. Learners are seen as active in their own learning, not merely as recipients of instruction. Constructivists conceptualise learners as participants, contributors and constructors of knowledge, which is always socially mediated. However, arguments on applicability of the learning theories focus on perceived benefit of one over the other, rather than the appropriateness of different practices to different settings and purposes (Cullen et al 2002).

Good practice in VET teaching and learning should not be tied to a particular educational theory (e.g. behaviourism, cognitivism or constructivism). Rather good practice has taken on a more pragmatic position in which appropriateness to different purposes and settings has become the key guiding principle of good practice.

A number of socio-economic changes in the VET sector worldwide have unsettled the recognised idea of teachers as fountains of knowledge and helped to move learning to a more constructivist approach. These include:

1. **Social and economic conditions** including the needs for work-related continuing professional development in some senses have contributed to the increased focus on learning techniques. This constructivist approach towards learning needs to encompass not only the formal requirements of a programme but also include ‘soft skills’ such as; strong work ethic, good communication skills, time management skills, problem-solving skills, self Confidence, flexibility and teamwork. Such transferable skills can be both difficult to deliver and to measure.

2. The **ability** of workers to continually **adapt** and **change** is highly valued. Technology changes, jobs change, skills change, the organisation of work changes. Consequently continuous learning is not only desirable but an inevitable feature of contemporary work.

3. **Conceptions of knowledge** are also changing. Forms of knowledge other than discipline-specific knowledge are now given more value in workplaces. Working knowledge is deemed to have a large impact on performance and this knowledge is seen to be created and shared socially.
4. Increasingly, learners are viewed as **consumers of education and training**. They are expected to contribute to the resourcing of their own learning and are becoming the builder of knowledge and skill sets to enable them to compete in the job market.

5. Decisions on which **learning theories** are most appropriate tend to focus more directly on ways of **transforming** professional and social **identities** and the creation of communities of practice. There is a shift from the notion of instruction to that of learning where the student becomes the centre of learning as opposed to the teacher/instructor.

These suggest that a shift in the use of learning theories is taking place through the use of learning practices that are more learner sensitive, which focus on the full learning potential of individuals, which actively engage learners in the planning, development and construction of their own vocational knowledge and skills.

“**Yes Sir, you’re absolutely right, you can never stop learning - in fact I’m on a course right now.”**
Summary

- The principal claim of behaviourism is that learning is achieved through conditioning. Learning is the development of new behaviour through this conditioning and requires no inner mental processing.
- Cognitivism is based on the understanding of human thought processes. Some of the work on artificial intelligence and attempt to have computers replicate mental process also contributed to Cognitivist thinking.
- Constructivism examines the interpersonal interactions and social – cultural context in learning and how these impact on the construction of knowledge.
- Good practice in teaching and learning in the VET sector should not be specifically tied to any of the outlined particular educational theory (e.g. behaviourism, cognitivism or constructivism). Rather, good practice has taken on a more pragmatic position in which appropriateness to different purposes.
1. List the three main learning theories
   1) _______________________________________________________
   2) _______________________________________________________
   3) _______________________________________________________

2. Give one example of where you might have used each of the three main learning theories in the past for your own teaching practice
   1) _______________________________________________________
      _______________________________________________________
      _______________________________________________________
   2) _______________________________________________________
      _______________________________________________________
      _______________________________________________________
   3) _______________________________________________________
      _______________________________________________________
      _______________________________________________________

3. How many of the 7 soft skills mentioned in this section have you incorporated into your teaching practice in the past and which of the skills do you think would be of most benefit to the construction workers on site today?
   _______________________________________________________
4. Define the term Social Constructivism

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Unit 1 Section 2

Learning Styles
2.1 Introduction

Learning is the assimilation of knowledge through study or experience. Learning can occur at any time, under many different conditions and through a wide variety of mediums. Through either a process of nature, nurture or both, everybody has a preference, conscious or subconscious for how they learn and this can be described as their learning style. For purposes of this manual, Learning Style is, “a student’s way of responding to and using stimuli in the context of learning”, (Cooke, 2001).

Although everyone will learn through a combination of different styles, one and sometimes two styles are usually dominant and the student will assimilate the knowledge more effectively utilising that particular style. Kirkwood (1998) believes an individual’s learning style is the most influential factor in determining how they learn.

There are in excess of 70 educationally based instruments which are used to categorize different learning styles. With such a large number of learning style theories, there is no-doubt going to be similar approaches and a significant amount of overlap between each model. This section outlines the principles behind some of the most common learning style models and also provides an opportunity for you to determine your own specific learning style aligned with those presented.

At the end of this section you will be able to:

1. List and describe a range of different learning styles
2. Identify your own preference learning style
3. Plan for learning opportunities for learners to be delivered based on a number of different learning styles.
2.2 Visual, Auditory, Reading and Kinaesthetic (VARK)

Visual, Auditory, Reading and Kinaesthetic (VARK) refers to how people take in or “assimilate” information. The VARK is possibly the most common learning style model.

Visual Learners

Visual learners learn best by seeing things and respond well to visual cues such as videos, graphics, drawings, graphs charts and animations. The use of colour can also be used to really good effect to provide emphasis as well as create and reinforce links.

Auditory Learners

Auditory learners are best suited to activities involving listening or dialogue. Learning will occur most readily through mediums of discussion, debates, lectures, and rehearsing. Style of learning is often reinforced in the majority of opportunities provided in higher education.

Reading Learners

This learning style can be linked somewhat to that of the visual learner but with a preference for written text rather than graphics. Learners will typically have a good command of language and learn best through reading, usually from a number of different sources. Learners with a preference for through this style may also express a preference for self-directed style of learning.

Kinaesthetic Learners

The third style of learner, Kinaesthetic, learns best by doing and activity based learning. They prefer moving, role play, and repetition of action. They should be encouraged to take breaks and move around rather than sitting still for too long. They prefer practical tasks/approaches rather than theoretical exercises.

Most people are categorized as dominant visual learners. This may be reinforced by teaching methods in tertiary education that rely on writing down notes from a chalkboard, reading, and more recently the use of computers. Learners who feel they learn best by processing text are categorised under the heading Reading/Writing. They find the best way to internalize information is by reading text and then writing about what they have learned.
Some people are referred to as multi-model learners because they have more than one strong (dominant) learning style. One of the best known instruments using the VARK model has been developed by Dunn and Dunn. (Fleming, 2007)

2.3 Kolb’s Experiential Learning Cycle

The Kolb model develops a theory of learning that combines a four tier learning cycle with learning style inventory that classifies learners into four groups with distinct two-dimensional learning modes. For Kolb the four stages of the learning cycle are Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualisation (AC), and Active Experimentation (AE). After completing the Learning Style Inventory, learners are placed into learning styles based on their two dominant learning modes. These four modes are Diverging (CE/RO), Assimilating (AC/RO), Converging (AC/AE), and Accommodating (CE/AE).

Another popular model based on Kolb’s cycle of learning theory combined with a learning inventory is the Honey and Mumford model. Their model is based on research into learners' behavioural tendencies. It uses a similar learning cycle model with four stages of: having an experience; reviewing the experience; concluding from the experience, and planning the next steps (Figure 1.2).

![Figure 1.2: Kolb’s Learning Cycle related to Honey & Mumford Learning Styles](image)
Honey and Mumford’s model assumes that people have preferred learning styles but that these are dependent on context and experience so are not locked into one style (Honey & Mumford, 1982).

Their four learning styles, unlike Kolb’s which result from the combination of two stages, are directly associated with each stage. These are summarised in Table 1.1.

Table 1.1: Honey and Mumford’s learning styles (Adapted from Rogers, J. (2001))

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Stage associated with</th>
<th>Likes</th>
<th>Dislikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activist</td>
<td>Having an experience</td>
<td>Doing and experiencing. Games, practical activities, anything that is energetic and involving.</td>
<td>Sitting around for too long; working alone; theorising; having to listen to others.</td>
</tr>
<tr>
<td>Reflector</td>
<td>Reviewing the experience</td>
<td>Time to think, observe, take it all in; watching others; solitude and time.</td>
<td>Being hurtled into activity, no time to think; crammed timetables; lack of privacy, no time to prepare.</td>
</tr>
<tr>
<td>Theorist</td>
<td>Concluding from the experience</td>
<td>To know where something fits into overall ideas and concepts; analysis and logic; being stretched; abstract concepts; structure, clarity.</td>
<td>Frivolity, mindless fun; wasting time; not being able to question; lack of a timetable and structure.</td>
</tr>
<tr>
<td>Pragmatist</td>
<td>Planning the next steps</td>
<td>Practical problem solving; relevance to the real world; applying learning.</td>
<td>Anything theoretical; learning that focuses too much on past or future and not present.</td>
</tr>
</tbody>
</table>

2.4 Multiple Intelligence

These learning styles/channels in some way can be likened to Howard Gardner’s Multiple Intelligences Theory.

Intelligences is a bio psychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture (Gardner, 1991).

Gardener outlined eight ways of thinking and knowing, thereby identifying eight categories of intelligence as:

1. Linguistic Intelligence
2. Logical-Mathematical Intelligence
3. Spatial Intelligence
4. Bodily-Kinaesthetic Intelligence
5. Musical Intelligence
6. Intrapersonal Intelligence
7. Interpersonal Intelligence
8. Naturalist Intelligence

Figure 1.3: Multiple Intelligences (Adopted from Gardner, 1991)
Gardner demonstrates that students learn in identifiably distinctive ways, and shows how necessary it is that subjects should be taught through a variety of means and strategies. He argues for a form of learning that will allow students to demonstrate their understandings in meaningful ways, which are more suited to their learning styles and intelligence profiles. Gardner refers to casualties in learning, that is, the large number of students who are motivated to learn but whose own learning styles or profiles of intelligence are not in tune with prevailing instructional practices. (Gardner, 1991)

These learning styles and intelligences must be stimulated for optimal learning and therefore it is recommended that course material and their delivery should be designed with this in mind.

Educational psychologists suggest that, in general the more one engages the senses of the learner, the more they learn. For example, learners will remember more of what is said if visual reinforcement is provide. The sense of sight is particularly important, and this fact should be taken into account in the design of learning material.

2.5 Blooms Taxonomy

A group of educational psychologists developed a classification of levels (Bloom’s Taxonomy) of intellectual behaviour they deemed important in learning (Bloom, 1956).

Bloom identified six levels within the cognitive domain, from the simple recall or recognition of facts, as the lowest level, through increasingly more complex and abstract mental levels, to the highest order which is classified as evaluation.

Bloom’s taxonomy can be used to help craft a wide range of questions—from low-level thinking questions to high-level to more abstract type of questions. Bloom’s Taxonomy is not level-specific. That is, it does not begin at the lower levels with knowledge and comprehension questions and move upward to the higher levels with synthesis and evaluation questions. The six levels of questions are appropriate for all levels. Though in practice unfortunately, observations of classroom-based instructors have repeatedly shown that lower-order questions are far more frequently used (Saeed, et al., 2012) (Anderson, et al., 2001).

Figure 1.4 depicts Bloom’s taxonomy of learning levels and a corresponding list of verbs that are attributed to that level of learning.
Verb examples that represent intellectual activity on each level are listed in Table 1.2

Table 1.2: Verb examples for different intellectual activity

<table>
<thead>
<tr>
<th>Intellectual Activity</th>
<th>Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, and reproduce state</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate</td>
</tr>
<tr>
<td>Application</td>
<td>Apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write</td>
</tr>
<tr>
<td>Analysis</td>
<td>Analyse, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, and test</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, and write</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support, value, evaluate</td>
</tr>
</tbody>
</table>
2.6 Conditions of Learning Model

Conditions of Learning Model expresses the view that there are several different types or levels of learning. The significance of these classifications is that each different type requires different types of instruction (Gagné, 1985).

Gagné identifies five major categories of learning: verbal information, intellectual skills, cognitive strategies, motor skills and attitudes. Different internal and external conditions are necessary for each type of learning.

For example, for cognitive strategies to be effective, there must be a chance to practice developing new solutions to problems; to learn attitudes, the learner must be exposed to a credible role model/instructor.

Gagné suggests that learning tasks for intellectual skills can be organized in a hierarchy according to complexity: stimulus recognition, response generation, procedure following, use of terminology, discriminations, concept formation, rule application, and problem solving. The primary significance of the hierarchy is to identify prerequisites that should be completed to facilitate learning at each level. Prerequisites are identified by doing a task analysis of a learning/training task. Learning hierarchies provide a basis for the sequencing of instruction (lesson planning).

In addition, the theory outlines nine instructional events and corresponding cognitive processes (Figure 1.5)

![Figure 1.5 Gagne's nine instructional events](image-url)
These events should satisfy or provide the necessary conditions for learning and serve as the basis for lesson planning and selecting appropriate media (Figure 1.6).

Figure 1.6: Conditions of Learning (adapted from Gange, Briggs and Wager 1992)

It should also be noted that the following principles apply:

1. Different instruction is required for different learning outcomes.
2. Events of learning operate on the learner in ways that constitute the conditions of learning.
3. The specific operations that constitute instructional events are different for each different type of learning outcome.
4. Learning hierarchies define what intellectual skills are to be learned and a sequence of instruction.
Principles of Effective Teaching and Learning

Perkins’ (2009) seven principles for effective teaching and learning are well suited to both learners and teachers in the world of vocational education as follows:

1. **Play the whole game**; Use extended projects and authentic contexts
2. **Make the game worth playing**; Work hard at engaging learners giving them choices wherever possible
3. **Work on the hard parts** - Discover the most effective ways of practising
4. **Play out of town** - Try things out in many different contexts
5. **Uncover the hidden game** - Make the processes of learning as visible as possible
6. **Learn from the team and the other teams** - Develop robust ways of working in groups and seek out relevant communities of practice
7. **Learn from the game of learning** - Be in the driving seat as a learner, developing your own tried and tested tactics and strategies.
2.7 The Curriculum Design Model

The "Spiral Model", incorporates principles of effective adult education (Figure 1.7). The model suggests that:

1. Learning begins with the experience and knowledge of the participants. The educational approach is learner-centred and aims at reinforcing learners' self-esteem, self-confidence and the development of a positive and realistic self-concept.

2. After the participants have shared their experience, they analyse that experience and look for patterns (i.e., what are the commonalties? what are the patterns?)

3. To complement the knowledge and experience of the participants, new information and theory from experts are added or new ideas are created collectively.

4. Participants need to practise what they have learned. They need to practise new skills, develop strategies and plan for action.

(Arnold, et al., 1991)
2.8 Characteristics of Adults as Learners (CAL) model

Cross (1981) presents the Characteristics of Adults as Learners (CAL) model in the context of her analysis of lifelong learning programs. The model attempts to integrate other theoretical frameworks for adult learning such as andragogy (Knowles), experiential learning experiential learning (Rogers), and lifespan psychology.

**Andragogy**

The term andragogy (and-rè-go’jè), as opposed to pedagogy, has been used to describe the art and science of teaching adults as argued by Malcolm Knowles.

It is argued that adult learners require specific conditions to learn and this can be seen in the comparison of pedagogy and andragogy, where adult learning appears to require more learner-orientated active-learning environment. (Conner, 1997-2004.)

**Table 1.3: Pedagogy vs Andragogy (adopted from Deighan, 2000)**

<table>
<thead>
<tr>
<th>Pedagogy</th>
<th>Andragogy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsory</td>
<td>Voluntary</td>
</tr>
<tr>
<td>Teacher-centred</td>
<td>Learning-centred</td>
</tr>
<tr>
<td>Minimal control by the learner</td>
<td>Education as freedom</td>
</tr>
<tr>
<td>Training for life</td>
<td>Assimilation of learning with life experience</td>
</tr>
<tr>
<td>Encourages convergent thinking</td>
<td>Encourages divergent thinking</td>
</tr>
<tr>
<td>Rote learning</td>
<td>Active learning</td>
</tr>
<tr>
<td>Dependency on educators learning</td>
<td>Learning and teaching roles are blurred</td>
</tr>
<tr>
<td>Imparting of information</td>
<td>Opening vistas for continuing learning and peer learning</td>
</tr>
<tr>
<td></td>
<td>Uncertainty about the outcome, whatever the curriculum content</td>
</tr>
</tbody>
</table>

CAL builds on andragogy and creates a model that consists of two classes of variables: personal characteristics and situational characteristics. Personal characteristics include: aging, life phases, and developmental stages. These three dimensions have different characteristics as far as lifelong learning is concerned. Aging results in the deterioration of certain sensory-motor abilities (e.g., eyesight, hearing, reaction time) while intelligence abilities (e.g., decision-making skills,
reasoning, and vocabulary) tend to improve. Life phases and developmental stages (e.g., marriage, job changes, and retirement) involve a series of plateaus and transitions which may or may not be directly related to age.

Situational characteristics consist of Part-time versus Full-time learning, and Voluntary versus Compulsory learning. The administration of learning (i.e., schedules, locations, procedures) is strongly affected by the first variable; the second pertains to the self-directed, problem-centred nature of most adult learning.

2.9 Outline of Limitations on the Use of Models

As noted above there are over seventy models in existence and that are used to categorize learning styles. Each model one has developed its own spectrum of learning. It noteworthy that there is a large amount of scepticism regarding the validity and usefulness of all learning style models. Opponents of such models criticise them for many flaws, such as limited research and testing, testing subjectivity, and lack of any evidence that these models can improve educational results. Despite claims for the potential uses of ‘learning styles’ for developing appropriate teaching strategies there is no research for the claim that by matching method of content presentation to individuals’ preferred ‘learning style’, better learning ensues (Landrum and McDuffie, 2010, Riener and Willingham, 2010).

It’s about really knowing the individuals very well at the beginning of the programme and tailoring learning for that person; that actually takes them on through the learning journey.

It has been argued that some of the learning style instruments are also deeply unreliable. Coffield (2004) found that approaches which, for example, assume that preferences for the visual or the auditory or the kinaesthetic (often referred to as VAK methods) are unreliable and sometimes unhelpful. If vocational teachers are trying to encourage confidence and an ability to deal with the non-routine, then only offering material in one format – pictorially, for example, for imagined ‘visual’ learners – is unlikely to be helpful.
By the same token, good teachers would be likely to mix and match and offer a range of visual, auditory and kinaesthetic approaches in their teaching. If learners are venturing into territory which the instructor knows they will find difficult, it would be a matter of common sense to choose a method of learning which is most likely to be suited to the learners’ known preferences.

What is far more likely is that, individuals have a preference for a particular mode of content presentation because it happens to be conducive to learning for a particular task (content) for which that person has a high natural ability. Were they to experience that preferred means of content delivery on a task for which they did not have a high natural ability, the evidence suggests they would learn no better than if they were presented the content through a different mode; one which lent itself better to that particular content. To summarise a wide range of learners benefit from delivery methods that are appropriate to the learning task at hand, even if they have a preference towards one style or model.
Summary

- The Kolb model develops a theory of learning that combines a four tier learning cycle with learning style inventory that classifies learners into four groups with distinct two-dimensional learning modes.

- Visual, Auditory, Reading and Kinaesthetic (VARK) model refers to how people take in or “assimilate” information.

- Intelligences is a bio psychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture.

- Blooms Taxonomy identifies six levels within the cognitive domain, from the simple recall or recognition of facts, as the lowest level, through increasingly more complex and abstract mental levels, to the highest order which is classified as evaluation.

- Five major categories of learning have been identified as: verbal information, intellectual skills, cognitive strategies, motor skills and attitudes. Different internal and external conditions are necessary for each type of learning.

- Andragogy, as defined by Malcolm Knowles, is the term used to describe the art and science of teaching adults as distinct from children (Pedagogy).
M1.U1.S2 Progress Check

1. Find a Learning style tool online and use the tool to determine what style you have.
   ________________________________________________________________

2. What are the implications for delivering learning material to a learner that has a learning style similar to your own?
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

3. Using an example from your own craft or trade, describe one effective method you could use to deliver, introduce or teach one concept, idea or important point to the learner identified in question 2 above.
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
4. It is the appropriateness of the learning content for the particular learning task that is the most important consideration for the success of the learner. With this in mind, give one way you could improve the learning content for all learners.

________________________________________________________________________

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Unit 2

VET Contexts and Settings
Unit 2: VET Contexts and Settings

The BUSI report (2012) highlighted the requirement for a shift from traditional models of construction training towards a more learner centred approach. It emphasised a need to consider learning outcomes beyond the acquisition of technical skills and competencies and into shared knowledge and experiences in communities of practice. This is seen as fundamental to the adoption of a new collaborative, systems-thinking approach to the construction/renovation process which embraces a culture of standards and quality. Consequently, the aim of this module is to examine the specific challenges of addressing both technical knowledge gaps and attitudinal change in the training of construction workers.

This Unit explores these challenges which are at the heart of FES training. It begins with a consideration of the context and settings typical to vocational education and training. It also examines the learner needs and motivation which may be most specifically relevant to construction workers. Learning theories which are particularly relevant to training for attitudinal change are explored for their potential for application in FES.

As group learning has been identified as a fundamental aspect of FES training, it is covered in greater detail. This includes the stages of group development, the characteristics of groups and principles to be considered for the design and management of group activities.

At the end of this unit you will be able to:

1. Describe typical vocational learners, and their context
2. Explain the learning and motivation theories implications on training for attitude change
3. List and describe the different stages of learner group development and their impact on group performance
4. Explain the principles of group dynamics and the effect of individual characteristics on group performance
Unit 2 Section 1

Vocational Learners
1.1 Introduction

Following on from a broader view of learning theory and learning styles, this Section focusses on vocational learners and, more specifically, construction workers. Vocational learners are associated with characteristics that differentiate them from students in higher education for example, they are concerned with both technical knowledge but also a need to acquire skills and also discover the role and place within their new community of practice (Ofsted, 2010).

This section considers the context and settings typical to vocational education and training (VET) and what motivates learners in this sector. This is followed by a focus on one of the specific challenges of the QualiBuild Foundation Energy Skills (FES) training initiative; *the training for attitudinal change*. Learning theory and training techniques which support attitude and perspective change are considered. These models are then evaluated in the context of the FES programme, specifically, the implications for design and delivery of this training.

At the end of this section you will be able to:

1. Discuss the implications of arenas and settings in a vocational training context
2. Describe the main principles of a range of motivational theories relevant to vocational learners
3. Describe the principles of learning theories that are specifically relevant to training for attitude change
1.2 Context in Vocational Education

Context matters in all kinds of learning. Learning something, for example, how to cut a roof while working alongside a foreman on a construction site is different from learning to complete a roofing exercise in a carpentry and joinery class at a training centre. Contextual perspectives regarding health and safety legislation identified onsite may also be different to what may be gained via an online course. Each of these situations is different. Firstly, the other learners who may or may not be present will affect things. Secondly, the instructor and his/her experiences, traditions and culture will shape the learning experience. And of course, what presents at the physical location will play an important role. (Lucas, et al., 2012)

Arenas and settings

There are two main elements to context – ‘arenas’ and ‘settings.’

Arenas are where the learning takes place, we would obviously acknowledge the classroom and workshops in VET but also can include the workplace, social venues such as the canteen, or any other places where learners meet and discuss their learning subjects.

Setting can be described as what happens when a learner interacts with an ‘arena’ and also engages with other learners.

This idea of a situated learning in a particular context is fundamental to vocational education and particularly the creation of Communities of Practice (COP). These communities of practice can be seen in two ways:

1. Communities of Practice as communities of learners.
2. Communities of Practice as collaborative professional groups within organisations.

Communities of Practice (COP)

Communities of Practice are groups of people who are united by a common interest or profession and wish to share information and experiences with a view to improving practices. By their very nature, they lead to a process of social learning, whether intentional or not (see Social Constructivist Unit 1 Section1). Communities of Practice within an organisation can encourage individuals to create, refine, share and use knowledge effectively to learn and develop from interaction with colleagues. For
example, the National Learning Digital Learning Repository was created to support greater collaboration in developing and sharing of digital teaching resources and associated teaching experience across all subject disciplines and communities of academics and to promote good practice use and re-use of existing resources. To date there are 25 organised COP under the NDLR umbrella. (NDLR, 2012). The Lean Construction Institute is also a COP who aims are to transform design and construction through new approaches to project design and delivery. The Institute plans on utilising the benefits of a COP to enable the members to learn rapidly and to continue to improve the value delivered to customers of capital projects, as well as the value to all who use the facility in the future. (LCI Ireland, 2014)

A COP allows its members to develop their capabilities and to build and exchange knowledge in a supportive environment of peers.

In an educational setting this can be useful in tackling problems set by an instructor in a group setting. In the organisation setting, and in the case of QualiBuild Project, these collaborative groups will be instrumental in allowing learners/workers to work together and solve problems so their learning habits and, importantly, to foster the transfer of any desirable work related attitudinal changes from learner-to-learner and from instructor-to-learner.
Context

Context is specifically important in vocational education, as most teaching takes place in the dual settings of both workplace and educational institution. A skill may be taught in one setting with a view to being largely applied in another, often in a move from training centre to workplace. This brings with it two further considerations or challenges, including:

1. How to ensure that what is learned theoretically in one context is applied effectively in another;
2. Anticipating how best learners can be taught so that they can prompt themselves to use skills learned in one context when they need them for real in another.

“We are communicating better but we are still not out of the woods.”
1.3 Learner Motivation

Learner motivation is a major factor that will dictate the level of engagement with course materials. There are many theories of motivation, the majority of them point to a need to cater for the high and low level needs of learners in order to elicit response and maintain that engagement. Abraham Maslow (1954) developed a hierarchy of needs, outlined in Figure 2.1, which emphasises the importance of first catering for the basic needs of learners by providing a comfortable and safe learning environment, before considering the higher level socio emotional and psychological factors affecting motivation. Satisfying learner needs for social interaction and belongingness, recognition and personal growth is challenging but can be achieved successfully.

Allowing opportunity for learner-tutor and learner-learner interaction, providing feedback and encouragement, and maintaining a learning environment which is respectful and inclusive for all is fundamental to catering for learner needs.

![Figure 2.1: Maslow’s Hierarchy of Needs](image)

Paul Hersey’s (1980) theory of frequency of distribution introduces a little more complexity to the consideration of Maslow’s hierarchy. He emphasises the constant potential for change in the learning environment which will affect the level of need at a given time.
In the traditional face-to-face training format, the tutor is in a position to observe and monitor changes in the learning environment and react accordingly. This is why adaptability is one of the fundamental skills of a successful trainer.

Vroom’s (1964) expectancy theory asserts that individual motivation is rooted in peoples hunger for success versus their fear of failure. It advances that people need to see a link between their efforts, their performance and the value of the outcome to them as an individual. This is somewhat similar to Maslow’s focus on the higher level needs which motivate learners. This emphasis on the value of the outcome for the individual reinforces the importance of understanding the profile of the target learner and tailoring instruction accordingly.

Edward Schein (1985) defined eight career anchors where individuals associate different rewards with a certain level of value. These are:

1. **Technical/Functional** – to be recognised as an expert in a field
2. **General/Managerial** – to have responsibility and status
3. **Autonomy/Independence** – prefer to work alone under their own rules
4. **Security/Stability** – prefer stability and avoid risk in their work life
5. **Entrepreneurial Creativity** – like to be inventive and creative, running their own business
6. **Service/Dedication to a cause** – driven by how they can help other people
7. **Pure Challenge** – stimulated by difficult problems/tasks
8. **Lifestyle** – focus on their work-life balance

Schein’s theory is also consistent with the need to profile target learners to determine their different interests, priorities and values. This information can be used to inform course development at the design stage and in determining the appropriate delivery approach.

The common thread that links these motivational theories is the requirement to satisfy the higher level needs (see Figure 2.1). Application of these theories to the design and delivery of instruction, has the potential to improve the level of learner engagement by catering for these needs. For example, Robert Gagné’s nine events of instruction, focuses on interaction and feedback, is one example of good practice in lesson planning. Both Gagné and Keller focus on instructional models which motivate learners by seeking to grasp their attention and maintain interest. Keller’s
ARCS model for example, identifies four categories of learner requirements for motivation, including: (i) Attention; (ii) Relevance; (iii) Confidence; (iv) Satisfaction.

The first requirement refers to the importance of gaining learner attention through active participation and enquiry. Relevance is then established by focussing on language, subject matter and experience that is familiar to the learner. Activities appropriate to the learners are employed and encouragement is provided through feedback which improves learner confidence. Efforts are then focussed on ensuring that learners are satisfied that their efforts have led to successful outcomes, thus leading to continued motivation. (Gagne, et al., 2005)

Motivation factors are varied for different types of learner, therefore broad generalisations should be avoided when discussing learner’s motivation. However, it is important to describe some of them so as to understand the vocational learner better. The most basic distinction between the types of motivators is whether they are intrinsic or extrinsic.

- **Intrinsic motivation** refers to doing something because it is inherently interesting or enjoyable.
- **Extrinsic motivation** refers to doing something because it leads to a separable outcome, an external reward.

It has been shown that the quality of experience and performance can be very different for intrinsic versus extrinsic factors (Figure 2.2).

![Figure 2.2: Types of Motivators](image)
Intrinsic Motivation

Some examples of intrinsic motivators include autonomy, a sense of belonging to a group, a mastery of skills, and the creation of meaning. According to Ryan and Deci (2000), intrinsically motivated learners:

- Are more content in their learning processes.
- Acquire knowledge in a more differentiated and more coherent form.
- Show a long-term retention of what was learned.
- Apply their knowledge more often than others.
- Show higher academic achievement.
- Perceive themselves as more competent.

Extrinsic Motivation

Some examples of extrinsic motivators include badges, competition, points, rewards and money.

Lei (2010) lists the characteristics of externally motivated learners as:

- More approach and avoidance ego-oriented.
- Studying less regularly.
- Showing less excitement.
- Less persistent.
- Using more surface level strategies.
- Having lower exam results.
- Being less interested in the course.

If a learner is presented with a task and provided with external incentives and reinforcements, they generally may not develop an intrinsic motivation to learn. In addition, if a student is provided with external incentives to perform a task and they would naturally find motivating; their desire to perform the tasks can actually decrease (Müller & Louw, 2004). Generally, when students focus their attention on external incentives, the rewards become the end themselves, rather than serving their proper function, to provide feedback on progress the students are making. See specific example at: http://psycnet.apa.org/journals/psp/28/1/129/.
Motivational characteristics of vocational learners

It has been suggested that many vocational learners look to leave the school environment at the earliest opportunity with vocational careers offering that chance.

‘The vocationally-inclined young person … is aware of the world ‘out there’, beyond school, and wants to join it…

....So it’s not just a matter of their interests or their mentality; the vocational route is the one that seems to respond to that urgency’

William Richardson

Many see the move from school-based learning to a form of work-related learning, e.g. Apprenticeship, as providing them with an opportunity to prove their worth while also being a means of keeping parents happy. Some learners see it as an escape route or a real or perceived academic underachievement, but when perceived this way can also lead to low self-esteem. Sometimes third level or formal education comes at the wrong time in the developmental stage of the learner.

Vocational education can be sold to less academic students as their only option i.e. it is for less intelligent learners and in effect this can be self-fulfilling. This image of VET is so widely felt in the community that there must be a feeling that it is true. Taking this into consideration VET must therefore also be able to deal with the building of self-esteem. Hyland (2006) argued that without task-specific interventions to overcome problems of confidence, even well-qualified students with extensive work experience can fall by the wayside.

Many vocational learners’ early in their career can be seen as relatively volatile, naturally risk-taking and boundary pushing. At this stage not only are they in the process of developing their own adult personality and credibility but also discovering the role and place within their new community of practice (OFSTED, 2010).
Research has highlighted vocational learners as being motivated by practical and active learning, looking for opportunities to apply their learning to work-related contexts or at work, and by the use of industry-quality resources’

'...young people’s enthusiasm and motivation for this strongly vocational element of their studies is often high .... ....their enthusiasm tends to be greater in lessons where they are given the opportunity to use and show their competence with industry standard resources.'

When considering vocational education, it is important to recognise that adult learners, by virtue of their existing skills and experience, come equipped with resources that will allow them to engage with new learning.

Knowles (1984) identified five areas of difference between mature adult learners and younger ones:

1. **Self-concept**: from a dependent personality towards a self-directed human being.
2. **Experience**: a growing reservoir of experience which is a powerful resource for learning.
3. **Readiness to learn**: increasingly related to the developmental tasks of social roles.
4. **Orientation to learning**: from just-in-case to just-in-time, requiring immediacy of application wherever possible as well as a shift away from subject-centeredness to one of problem centeredness.
5. **Motivation to learn**: an internal motivation to learn much less influenced by external factors such as qualifications.
Knowles (Smith, 2002) also showed that adult learners tend to be less influenced by the instructor’s pedagogic decisions and allow for more self-directed and less dependent learning. He also noted that there are several areas to be aware with the delivery of learning to adult learners, such as the possibility of low basic skills, such as literacy, numeracy and ICT.

1.4 Educational Settings

Just as instructors in the VET sector are typically drawn from the dual professional worlds, academic/work-based, their teaching settings also span the worlds of work and education. These physical aspects of the learning environment heavily influence the approach to delivery an instructor can take. For example, skill-based Workshop Practice allows the learner to engage in real life work-based assignments then moving to collaborative investigations and also practising skills on specialised equipment. This can all be provided and enhanced with expert instruction. This approach can be more difficult in a classroom based ‘setting’ for instruction. There are two distinct areas to focus on in the understanding of educational settings, the physical space and the culture of learning.

The physical space

The places where vocational education takes place include institutes of technology, training centres, manufactures training centres and workplaces. Within these spaces, there is a much larger list of designed learning environments including workshop, classroom, training room, lecture theatre, computer suites, and virtual learning spaces. Each of these learning spaces affords different opportunities for learning and teaching.

For example, while it is possible to have vocational learners work collaboratively on a task in group of threes while in classroom or work place, this can be very difficult to replicate in a lecture theatre. It has been stated earlier that vocational learners looking for opportunities to apply their learning to work-related contexts or at work, and even with the use of industry-quality resources this can be difficult to simulate within a training centre. In making pedagogic choices, the physical settings clearly matter. They can enhance choice or limit it.
Culture of Learning

The culture of learning in any setting is defined by the values and beliefs of those who work and learn there. Some of the key characteristics present where a learning culture exists are systems thinking, personal mastery, use of mental models, a shared vision and team learning.

The characteristics particular to creation of a culture of learning within the VET include (Hobby, 2004):

- Having the highest ambitions for every learner.
- Putting the welfare of learners ahead of the comfort of staff.
- Focus on capability and learning (inputs) to improve outcomes.
- Promoting team work and learning from each other; reduced professional autonomy.
- An intolerance of failure and excuses for underperformance (in staff).
- Value on discipline, reliability and service delivery.

Particularly in a vocational setting, to ensure a culture of learning, there is need to cultivate routine expertise, resourcefulness, functional literacies, craftsmanship, business-like attitudes and wider skills. All of these criteria have implications on the selection of the physical setting, and two examples of this are:

1. If tools are locked away in cupboards, it suggests that tools are controlled by the trainer rather than freely accessible.
2. If in very practical subjects those leading the session constantly fill sessions with talk and theory, then despite their assertion that they value first hand experiences, this may not be the message that those in their sessions receive.
1.5 Training for Attitude Change

The recent emphasis of EU and national policy on energy saving targets for buildings has led to significant amendments to Irish building standards. A new approach to the building construction/renovation process is now needed, requiring greater levels of responsibility for quality from individual workers and a collaborative approach from all to achieve energy performance standards (Build Up Skills Ireland, 2012). This has led to a need to develop a new Foundation Energy Skills (FES) training programme, to address the knowledge gaps and attitude change requirements of construction workers.

The approach to training on this programme will need to differ from the traditional models of skills training associated with construction workers. Training for attitude change is challenging and requires trainers to be aware of the subtleties of facilitating discussion and group activities while maintaining a focus on learning objectives. In an attempt to establish a coherent and robust approach to this training, a number of learning theories should be considered for their potential and suitability for training the target learner cohort.

This section begins with an exploration of learning theory specific to attitude change. The practical application of these theories is then considered, including an examination of their implications for the training construction workers.

Theories of attitude formation and change

Before the possibilities for incorporating specific aspects of learning theory in Foundation Energy Skills (FES) training can be explored, it is important to consider the existing models used for training construction workers. Traditionally, training follows a typically objectivist approach to learning, i.e., that knowledge simply exists and there is no need to construct new knowledge. A number of skills are taught onsite through informal instruction and experiential learning. For formal skills training, a standards based system (SBS) of apprenticeship is currently in operation, officially introduced in 1994 to replace an existing time served model.

The off-the-job educational phases of apprenticeship training follow set curricula and assessment stages which are centrally administered by SOLAS (formerly FÁS). The delivery mode is a combination of classroom based lessons and skill-specific workshop practice. Related theories are taught in the classroom and reinforced through the completion of projects in the workshop, consistent with behaviourism.
To further examine the learning processes accommodated in traditional training models for construction workers, consider Bloom’s widely recognised taxonomy of educational objectives (Clark, 2014). Bloom divides learning objectives into three categories (Figure 2.3) as follows:

- The Cognitive Domain – concerned with mental skills and knowledge
- The Affective Domain – dealing with attitudes and values
- The Psychomotor Domain – learning of manual and physical skills

![Learning Domains Diagram](image)

**Figure 2.3: Bloom’s Taxonomy of Learning Domains**

It is apparent that existing models of training for construction workers are focussed on the psychomotor domain and, to a lesser extent, the cognitive domain. The attitudes and values of the individual learners are not specifically highlighted as important outcomes the objective is to teach in the established ‘right way’ to perform tasks.

For the proposed FES training, the objective is to address both knowledge gaps and where necessary, the requisite attitudinal changes that are currently not captured by the current training approaches. Therefore, the FES training will need to focus on the cognitive and affective domains of learning. It is reasonable to assume that a didactic or behaviourist approach to this training will not change the attitudes of workers who believe that they already know the ‘right way’ to do their jobs. Therefore, a close consideration of the affective domain will be required to achieve attitude change.
The Affective Domain

Affective learning is concerned with attitudes, values, interests, appreciations and responsibility. Krathwohl’s (1999) taxonomy of the affective domain is the most widely recognised in education (Figure 2.4). He describes the five learning levels to progress to an educational objective as:

- Receiving – a student’s willingness to attend
- Responding – active participation on the part of the student
- Valuing – the worth or value a student attaches to the idea or materials
- Organisation – of ideas or values
- Characterisation by value – the internalisation of values

Figure 2.4: Krathwohl’s taxonomy for the Affective Domain of learning illustrated as five steps to an educational objective

In this process, the learner is moving from becoming aware of and attentive to new phenomena, to internalising the learning so that it affects their actions or behaviours.

Learning in the affective and cognitive domains is often intrinsically linked as the new knowledge or information is the stimulus for the change in attitude. Commonly, affective learning outcomes are linked to cognitive learning objectives. For example, a possible learning outcome for FES would be “Communicate the need to engage with other crafts to meet specific design demands”. If you accept that construction workers are generally unaware of the importance of collaboration with other crafts
and it is not a part of their culture, then this learning outcome needs to address both knowledge and attitude aspects.

- Central to training for attitudinal change is the need for presentation of persuasive arguments for change and robust, unambiguous examples.
- To challenge an experienced workers views on the ‘right way’ to do their job requires careful planning of lessons to include opportunity for learners to reflect on new information and how it fits with their existing belief system.

The expression of affective learning outcomes often involves statements of opinions and beliefs. This would naturally require the learner to attach meaning to new information and assimilate to their own belief system, a central principle of constructivism. Examples cited in educational circles of the application of Krathwohl’s affective taxonomy are often consistent with constructivism and social constructivism principles. They emphasise the importance of participation in team problem-solving activities/discussions and taking responsibility for own learning.

- For the FES programme, the challenge is to address knowledge gaps and affect cultural change for an entire industry workforce. It is reasonable then to conclude that, a consideration of the potential influence of crowd psychology would be appropriate.
- Employing group activities and discussion in learning can be an effective way to achieve common consensus and acceptance of change.

**Role of Constructivism in Effecting Attitudinal Change**

Constructivism is a philosophy of learning based on the belief that learners construct meaning individually rather than having it ‘delivered’ to them (see more details in Unit 1 Section 1). Bruner (1996), a key proponent of constructivist theory, argues that, learning is an active process in which the learner constructs new ideas and beliefs based on past experience or knowledge.

Therefore, the learner’s past experiences are the pool from which they attach meaning and relevance to new learning.

Bruner’s theory of instruction’s based on four key principles of:

1. Instruction should establish the relevance of the material to the learners so that they are willing and able to learn (readiness);
2. Learning content should be structured in a way that is most readily interpreted by the learner;

3. The sequence that content is presented in should be progressive and effective;

4. The instruction should encourage the learner to go further than just the information given.

- This approach would appear to have merit in training to support attitude change.
- The willingness of a learner to be open to new information would seem significant if long held beliefs are to be challenged in the learning process.
- The principle of structuring content to suit the target learner is logical. It would also be beneficial to have learners accepting some responsibility for their learning.
- In taking ownership, learners are more likely to identify what is meaningful for them.

It is noteworthy that Bruner's theories are closely linked to child development research. However, the target cohort for FES training is adult learners, for which specific learning theories have been developed. For example, Malcolm Knowles (1980) defines andragogy as “the art and science of helping adults to learn” (see in more detail Unit 1 Section 2).

Merriam (2001) describes five assumptions underpinning andragogy, defining the adult learner as someone who:

1. has an independent self-concept and who can direct his or her own learning
2. has accumulated a reservoir of life experiences that is a rich resource for learning
3. has learning needs closely related to changing social roles
4. is problem-centred and interested in immediate application of knowledge
5. is motivated to learn by internal rather than external factors

Some of these assumptions potentially pose problems for application in FES training as self-directed learning is unfamiliar territory for the majority of construction workers.

Merriam (2010) acknowledges criticisms of the Knowles Andragogy theory that, “Some adults are highly dependent on a teacher for structure, while some children
are independent, self-directed learners”. Adults may also be more motivated by external factors, such as employment opportunities or potential salary increment attached to continuing professional development.

In this context, it will be important in FES training to emphasise the potential benefits to participants. Once the principles of low energy building are accepted to the mainstream training requirement for all building workers, it will be important to highlight the opportunities that this brings. This may include the possibility to be on a register of qualifying workers and the potential to be associated with quality workmanship.

Transformative Learning

The emphasis in andragogy on attaching meaning to learning, makes it ‘learner centred’ and aligned with constructivism. Another theory of learning that is prominent in adult learning and is constructivist in approach is transformative learning. This type of learning requires a change in learners meaning schemes, including attitudes and beliefs.

‘Describes the conditions and processes necessary for students to make the most significant kind of knowledge transformation: paradigm shift, also known as perspective transformation’

McGonigal, 2005

Originally developed by Jack Mezirow (Culatta, 2013), transformative learning theory is divided into two types of approaches to learning, namely; Instrumental learning, which focusses on problem solving tasks and the cause and effect, and; Communicative learning, where individuals communicate their feelings, emotions and desires. Problem based learning (PBL) is rooted in the constructivist approach of learning, i.e., “learning is promoted when learners are engaged in solving real-world
problems” (Merrill, 2002). Transformative theory also emphasises that reflection is similar to problem-solving in that we “reflect on the content of the problem, the process of problem-solving, or the premise of the problem” (Mezirow, 1991).

Transformative theory emphasis on communicative learning is consistent with social constructivism. Transformative learning (see illustration in Figure 2.5) requires “participation in constructive discourses” with others to explore assumptions and consider alternative insights. This is consistent with social development theory, as developed by Lev Vygotsky (1987) where community is seen as having a central role in developing meaning. Vygotsky contends that the range of skill that can be developed with adult guidance or collaboration with peers far exceeds that which can be achieved alone.

**Figure 2.5: Transformative learning experiences (source: C. Montgomery, 2012)**

**Implications for FES training**

It would appear that for learner-centred approach, consideration for the affective domain and group problem-based learning are all relevant to training for attitudinal
change. However, as already noted, self-directed and group learning are still uncommon in the training of construction workers. Mezirow (2000) acknowledges that effective participation in discourse requires a level of emotional maturity. There is a danger that construction workers attending a relatively short training programme will be affected by a lack of confidence in this type of learning environment and perhaps feel intimidated by peers.

Learning in groups is subject to a range of complex elements, such include; individual characteristics, group dynamics and interaction theory. Therefore, it would be important to pay close attention to the learner readiness of the course participants.

A focus in the initial stages of the training on establishing relevance and extrinsic and intrinsic motivations would be useful to prepare learners for engagement with group activities. A possible suitable approach is Keller’s ARC’s model described in Unit 2 section 1.

The first requirement of Keller’s model refers to the importance of gaining learner attention through active participation and enquiry. This is consistent with an activation in instruction, where learning is promoted when knowledge from past experience is recalled as a foundation for new knowledge. This currently is being designed into the FES programme, specifically in the learning objects in form of 3D cut-away building sections (single or multiple storey), an image that will be familiar and accessible to all participants.

Relevance can then be established by focussing on language, subject matter and experience that is familiar to construction workers. Activities should be employed which provide the opportunity for encouragement through feedback leading to improved learner confidence.

An example from the FES programme is a group activity where participants are tasked with selecting appropriate construction details from a number of acetate sheets. These may be superimposed over each other to demonstrate principles of continuous insulation and air tight layers in a building type (see Figure 2.6). This provides an opportunity for learner satisfaction, where efforts have led to successful outcomes, and therefore could maintain learner motivation.
Figure 2.6: Use of acetate overlay sheets in group activity

Attending to the affective domain and incorporating peer-to-peer learning is challenging for a trainer. Research into the role of the affective domain in further education has noted some difficulty with group work. Therefore, trainers have a role as “relational gatekeepers in the classroom”, which requires a high level interpersonal skills and an understanding of group development and dynamics.

Conclusions

It is clear that training for attitude change is challenging and requires careful consideration at the instructional design stage. Adult learners by definition have embedded beliefs and value systems so it is obvious that new ideas cannot simply be forced upon them.

Learning theories that promote the possibility of perspective transformation and value attachment for the learner appear to have the most potential. However, all theories have limitations in practice and there are a number of issues that may arise that are specific to individual learner profiles and the scope of the proposed training.

For a training programme incorporating constructivist and social constructivist principles to be successful in effecting attitudinal change, it needs to closely consider the following:
• The target learner, it is necessary to understand the profile of the target learner and tailor the programme accordingly

• The learners should not have their existing beliefs challenged directly; rather they should be allowed to come to their own conclusions on the need for change in their work practices. The training should, therefore, present real-life examples relevant to the learners that are clear and unambiguous

• Social interaction with peers should be facilitated and encouraged in the training. This will improve the learners sense of belonging and increase the chance of new approaches being accepted and adopted by the masses rather than individuals

• It is important that trainers have the skills to implement this training and understand the level of commitment required to meet the needs of the learners
Summary

- The context of vocational education has unique characteristics.
- There are a number of theories of motivation which are relevant to vocational learners. Most emphasise the importance of catering for a range of learner needs ranging from more basic requirements to more high level psychological and socio-emotional needs. Adopting good practice in lesson planning and delivery of training to gain attention and maintain relevance will enhance learner engagement.
- Training of construction workers traditionally focusses on the Psychomotor and Cognitive domains of learning. The Affective domain is concerned with attitudes, values, interests, appreciations and responsibility. It will be necessary to for the Foundation Energy Skills (FES) training to incorporate affective learning if attitudinal change is to be achieved.
- Constructivist learning theory focusses on the learner attaching meaning to new information and taking some responsibility for their own development. It is reasonable to conclude that meaning is important in the context of attitude change, where people are expected to adopt new beliefs and behaviours.
- Social development theory emphasises the importance and potential of peer to peer learning. In the context of an objective of changing attitudes and bringing about cultural change in an industry, it has particular relevance for its potential to affect crowd psychology.
- Transformative learning is concerned with the process of perspective change. It is achieved through active participation in problem solving tasks and learners engaging in constructive discussion where bases for individual feelings and beliefs can be explored and appropriately interrogated.
- Training for attitude change will require trainers with the necessary skills to facilitate effective group work while maintaining motivation and engagement in the learning environment.
M3.U2.S1 Progress Check

1. Provide a definition for the following two terms as they apply to vocational education

   1) Arenas:
      _______________________________________________________
      _______________________________________________________
      _______________________________________________________
      _______________________________________________________

   2) Settings:
      _______________________________________________________
      _______________________________________________________
      _______________________________________________________
      _______________________________________________________

2. List and briefly describe each of Maslow's Hierarchy of Needs in order beginning with basic needs and progressing to self-fulfilment needs

   1) ______________________________________________________
      ______________________________________________________
   2) ______________________________________________________
      ______________________________________________________
   3) ______________________________________________________
      ______________________________________________________
   4) ______________________________________________________
      ______________________________________________________
   5) ______________________________________________________
      ______________________________________________________

3. Provide a brief description of four characteristics associated with intrinsically motivated learners

   1) ______________________________________________________
   2) ______________________________________________________
   3) ______________________________________________________
   4) ______________________________________________________
4. List the five learning levels described in David Kratwohl's Taxonomy of the Affective Domain

1) _____________________________________________________
2) _____________________________________________________
3) _____________________________________________________
4) _____________________________________________________
5) _____________________________________________________

5. Define the following two terms as they relate to Jack Mezirow's Transformation Theory

1) Instrumental Learning:
   _____________________________________________________
   _____________________________________________________
   _____________________________________________________

2) Communicative learning
   _____________________________________________________
   _____________________________________________________
   _____________________________________________________
Unit 2 Section 2

Learning in Groups
2.1 Introduction

What is group learning?

An important feature of most face-to-face teaching is that it takes place with a group/cohort of students. However, formal lectures at times can be seen as an attempt to remove the group learning dimension, with an emphasis on the instructor as the fountain of knowledge. Group learning, building on the potential of social constructivism, is an important teaching/learning technique that can be used to ensure active participation and peer-to-peer learning.

In a group setting, learners have an opportunity to interact with each other to acquire and practise the elements of a subject matter and to meet common learning goals.

The following section looks at the theory behind group development and how learners behave in groups. It also considers techniques for managing group learning activities to ensure that a focus is maintained on learning objectives.

At the end of this section, you will be able to:

1. List and describe the different stages of learner group development and their impact on group performance
2. Explain the principles of group dynamics and the effect of individual characteristics on group performance
3. Describe techniques for creating a climate that promotes learning in group activities
2.2 Group Development

Comprehensive learning groups take time to develop. The length of time depends on factors such as size, frequency of interaction, and structural features. Published literature on the development of learning groups reveal a wide range of models concerning developmental processes.

Probably the most influential model of the developmental process of groups has been that of Bruce Tuchman (1965) which was based on an analysis of group models which had previously been developed.

Though originally developed as a four stage model (i.e., forming, storming, norming, performing) the model was further refined to include adjourning (see Figure 2.7).

![Figure 2.7: Five Stages of Group Development](image)

**Stage 1: Forming**

In this stage, there is a sense of exploration as group members get to know one another. There's a focus on similarities and differences and first impressions are key as people try to figure each other out. Group members also look for a group leader to provide guidance and direction. Orientation is an important task in the forming stage. Members attempt to become oriented to the tasks as well as to one another.

It is also helpful to set group ground rules at this stage, which are expectations about how the group will interact, for example task division, how decisions will be made, and how people will treat each other.
To progress to the next, each member must relinquish the comfort of non-threatening topics and risk the possibility of conflict. Characteristics of the Forming Stage

- Exploration
- Focus on similarities and differences
- First impressions are key
- Confusion/anxiety
- Lower productivity
- Issues of inclusion, leadership, developing trust
- Open communication is a must

**Stage 2: Storming**

In this stage, when group members get to know each other better, conflicts can emerge in the relationship of members based on issues relating to the task and responsibilities.

As the group organisation begins to take form, individuals may have to move from their comfort zones and be forced to change their beliefs, feelings and attitudes to suit. If this move is resisted conflict can ensue.

Relationships may become strained and differences uncomfortable. Therefore, where practicable, some of these issues must be resolved because if left unaddressed, they may precipitate anger and hostility, and therefore the group may become rather unproductive.

In order to progress to the next stage, group members must move from a "testing and proving" mentality to a problem-solving mentality. The most important factor in enabling groups to move forward is addressing problems such as conflict within the group, poor communication styles, and learning to appreciating differences between members of the group. Defining characteristics of the Storming Stage are:

- Competition between members
- Strained relationships
- Leadership challenge
- Tension and disunity
- Ensuing differences become uncomfortable
**Stage 3: Norming**

In the norming stage, the group begins to be effective. Group members become aware of their role within the group and become comfortable in working on and maintaining the group dynamics.

At this stage group members have a trust in their peers in the group, which allows for an open mind and forms basis for true collaboration. The issues become how to strengthen relationships, open communication and provide positive and constructive feedback.

The team now focuses on cooperation. However, group members may begin to fear the breakup and therefore they may resist change of any sort. Defining characteristics of the Norming Stage are:

- Increased cohesion and collaboration
- Emerging trust
- Appreciation of intrinsic differences that may prevail
- Issues of strengthening relationships, open communication, positive/constructive feedback

**Stage 4: Performing**

Groups that are able to reach the Performing stage are typically filled with enthusiasm and focused on creative problem solving in an interdependent way.

Characteristics of a group at the performing stage include harmony, productivity, effective problem-solving and full development of the potential of the group and the individuals in the group.

In this stage, learners can work independently, in subgroups, or as a total unit. Their roles adjust to the changing needs of the group and individuals. Individual members have become self-assuring, and the need for group approval is less significant. Leadership is shared and participative, and the group leadership role is mainly delegation. The overall goal at this stage is productivity through problem-solving and work. Defining characteristics of the Performing Stage are:

- Harmony
- Productivity
- Problem-solving
- Shared and participative leadership
- Full development of potential
Stage 5: Adjourning

Adjourning is the final stage which only occurs when a group has fulfilled its goals and objectives. This stage may come quickly for a classroom based task though a more permanent form of group might function for a long period of time without reaching the adjourning stage.

This stage is also referred to as the Mourning Stage as group members may feel a sense of loss and their motivation may decline when the group's work comes to an end.

At the Adjournment Stage it is important to achieve closure for the group on a positive note, usually by providing recognition for their participation and accomplishments and celebrating the group’s overall success.

The following points are key for a learner group to successfully develop through the stages of group development (Tuckman & Jensen, 1977):

1. Rotate the responsibility of group facilitation;
2. The purpose/mission of the group must be clear to all members and the purpose/mission should be periodically revisited;
3. Ground rules should be established and monitored;
4. The group should understand that “positive conflict” is a normal and perhaps necessary part of group development;
5. Members must be reminded to “listen” to each other.
6. Wrap-up at the end of each session should comprise of meaningful and constructive comments relative to the group process.
7. Everyone must contribute and work to make the group a “learning team.”
2.3 Group Performance

A useful tool to support the work of facilitating groups for instructors is the team performance model developed by Drexler at al. (2009). In this model, they identify seven stages that describe a team's evolution from formation through task completion and renewal (Figure 2.8).

### 7 STAGES OF THE TEAM PERFORMANCE MODEL

1. **Orientation:** Why I am here?
2. **Trust building:** Who are you?
3. **Goal clarification:** What are we doing here?
4. **Commitment:** How will we do it?
5. **Implementation:** Who does what, when, where?
6. **High performance:** Wow!
7. **Renewal:** Why continue?

Figure 2.8: Seven Stages of Team Performance (adopted from Drexler et al. (2009))

**1. Orientation**

Group members need to know why they are in a group and why others are there. They need to know how they can contribute to the work of the group. They need to know that the team can accomplish something worthwhile.

Learners will ask questions like:

- What will these sessions be like?
- Will I be able to succeed in this course?
- Do I know enough to be successful here?
- How will this course help me?

At this stage a learner will need to be given the answers to these question or they may disengage from the group activities. The instructor should try to show how the module links with the needs of the learners. This link is fundamental in providing the individual members to take the risk in participating with the group.
2. Trust building

Group members need to know they can trust the other members of the team and need to feel trusted by them. When team members trust each other, the feedback is more open and honest. Members learn that their own risk taking builds this trust.

Learners will ask questions like:

- How am I like other people here? Am I different from them?
- Will they like me? What will happen if they don’t accept me?
- Will I look stupid? Will I embarrass myself?

If the learner does not get satisfactory answers to these questions, then they are likely to look at other members with distrust. They will not relax within the group and often feel isolated, they may at this stage, decide to try and leave the group. If the answers are satisfactory, they will feel comfortable in the group, and as a consequence will feel more ready to learn. A key issue for the instructor is to help the group members to trust one another.

3. Goal and role clarification

Group members need to know the specific task of the group. They need to know and understand what is within their area of control and what is not, and what each person’s roles of responsibility are with respect to these goals. Agreement on the purpose of the group and roles of the members needs to be agreed before meaningful work can be done by the group.

Learners will ask questions like:

- How will this group be different from my daily interactions with others?
- What risks will I have to take?
- If I’m asked to do things, will others see how nervous I am?
- What will happen if I’m asked to do something and I don’t succeed?
- How important will I be in the group?

If the learner does not get satisfactory answers to these questions, they are left with two options, to either fight for their role or the learner will become quiet and
disillusioned. The instructor will need to facilitate the group by developing appropriate answers to the above questions. This allows each member of the group to see their role and expectations of their contribution to the group.

Drucker (1995) proposed a criteria for guiding a group in reaching its goals. This criteria was represented with the acronym **SMART** though originally developed for the workplace it may be suitable for learning goals. Drucker stated that each task should include the elements illustrated in Figure 2.9.

**Figure 2.9: Drucker’s SMART criteria**

**4. Commitment**

Group members need to know how they will do their work together. They need to have a shared understanding of how decisions will be made; how resources will be allocated, and how dependant they are within the group on each other’s application to the goals of the group (interdependency).

Learners will ask questions like:

- How are we going to achieve our goals?
- Who decides how we arrive at decisions?
- What is my role?
If the learner does not feel valued or adequately supported at this stage they may again question their position within the group. When the group is successful at this stage everyone in the group has a shared vision of where the group is going and they understand and accept the role that each person will play in achieving the goals of the groups. Resources are distributed to help them achieve their aims.

5. Implementation

Members of the group need to have a clear vision of the overall process for the group successfully achieving its goal. They need to see how their individual contributions as well as each members contributions impact with this process.

At the implementation stage, the group puts into practice the plans it has. The members get a chance to carry out the roles that they saw for themselves in the previous stages. Everyone is working from a sense of who should be doing what, where and when.

Some issues that may arise at this stage if it has not been well developed include;

- The group project is likely to be highly confused.
- Group members work to a schedule that suits them, rather than the group task.
- Group members question their commitment to the group.
- The members may start to renegotiate on their role in the group, and wonder about their possible contribution.

Though a well-developed process will lead to a group that is highly motivated. This will allow the members to contribute in achieving the groups’ goals during the implementation stage and provide for a strong sense of satisfaction amongst its members.

6. High Performance

Only teams where members become highly interdependent, highly interdisciplinary and creative in their problem solving achieve the high performance level. At this stage all team members are working in unison towards, the group’s goals. This often leads to the group wanting to take on other projects of a similar nature so that it can use its expertise. If the stage is not well managed by the facilitator, the group can begin to suffer from strain of working at this high performance level.
Overload can sometimes lead to a lowering in performance levels, and a series of missed deadlines. The group may regress to the previous stage and would need to reorganise its implementation of the group project. However, if the group has a well thought out implementation plan, the bond between the members of group can become even more cohesive. The group will have strong sense of each other’s abilities and weakness and be able to compensate for them.

7. Renewal

From time to time members in a group need to recommit themselves to the work of the group or decide to leave the group. At this stage members can decide that they have achieved the purpose of the group, celebrate the completion of the project, and they disband. If they feel that the group still has value, it allows for a refocus on the purpose of the group.

Summary of Model

Drexler’s seven-stage model (Drexler, et al., 2009) focuses mainly on the energy level of the group. Even assuming positive intent on the part of the participants, the journey from a group to a team can face many obstacles.

A skilled instructor needs to facilitate the group through seven development stages so that they become a group in the full meaning of the word as opposed to a collection of individuals (Figure 2.10)
Figure 2.10: The Team Performance Model

Figure 2.10 depicts the sequence of the seven stages. It is important to remember that as the group moves toward its goal of ‘high performance’ it may regress by a stage before moving forward again. Individual members may also move at a different pace towards the reach different stages at different times.

As a team we can create problems none of us could cause as individuals!
2.4 Group dynamics

Group dynamics have a major impact on the success of learner groups through all stages of development. Not only does the different type of participants have an impact but also nature of hierarchy in groups as may be prescribed by the instructor.

There are three types of hierarchy in decision-making.

1. **Autocratic**: The instructor decides everything, without any consultation.
2. **Consultative**: The instructor consults with the learners about their needs and what ideas they have. However, the final decision is the instructors.
3. **Cooperation**: Here, the focus is on partnership between the instructor and the learners.

The selection of the above type of hierarchy within the classroom will impact on the three generic types of learners below.

1. **Dominant learner**: Dominant behaviour can often disrupt the dynamics of a group and the synergy of the training session. Individuals may dominate group activities or discussions to such an extent that others may feel excluded from contributing.
2. **The passive learner**: the passive or non-participating individual needs the instructor’s attention to encourage them to participate. Individuals may be passive for a variety of reasons. They may be bored, anxious, or shy.
3. **The resistant learner**: a learner may show resistance to the training event for a number of reasons. These include past experience, personal problems, literacy problems, feeling overwhelmed or resentment because they have to attend training.

**Handling of difficult participants**

Although the proceeding above section described of the three generic type of learners, it is worthwhile to further delve into the characteristics of the disruptive type of learner. Pike and Arch (1997) describe a number of different types of participants and how they can disrupt the group dynamic (Figure 2.11).
It is important to recognise why people behave in particular ways. Some reasons may include:

1. They are seeking attention. They need to be recognised and hope that someone in the group, especially you as a trainer, will give them a little extra attention.

2. They wish to avoid failure. Sometimes, learners are afraid that they may be asked to do things that they are unable to do, or will make them look foolish. One way of coping with this is by engaging in distracting behaviour.

3. They want to achieve status in the group. This is basically a power issue. The learner may need to be confronted about this behaviour.

1. They have very difficult personality factors, which may need professional help. Sometimes learners have behaviour problems that an instructor cannot deal with in the training session.
Approaches for handling difficult participants

In order to deal with the variety of participants involved with groups, Pike and Arch (1997) described a set of general approaches to dealing with them, and particularly difficult participants!!!!!!!

Instructor led activities

These are actions taken by the instructor to deal with the participant. Such actions include varying the pace, raising your voice, using humour. Standing close or use frequent eye contact with them to someone who is distracting the group.

By breaking up a training session with focus groups or brainstorming sessions it will help to keep learners involved. Sometimes, an individual will need to be dealt with on a private basis, so as not to embarrass them in the group.

Adequate preparation by the instructor can help to limit disruptive behaviour. In theory this planning needs to take into account the individual needs of the learners, but can be difficult to deal with in short learning sessions such as 1 day events. Again in these situations the instructor will need to use humour, frequent opportunities for learner engagement, group exercises and feedback sessions.

Group Work

While the learners are engaged in group work, the instructor can organise group work so that disruptive individuals do not ruin the training session by:

- Rotating membership of small groups,
- Building in incentives for success, which often helps concentration.
- Rotating roles in groups — leader, recorder, time keeper, etc., (the rationale for this is follows)
It is also important to remember that since learning is about change, it is disadvantageous for any member to become fixed in their role within the group.

Members of a group will attempt to take up the same role in every group, if provided the opportunity. Some steps the instructor can take to combat this include:

- Asking any quiet members of the group for specific contribution, i.e., attempting to take answers from all members of the group;
- Select less obvious, for example quiet or shy learners to lead groups
- It means picking up on lateness etc., by the "good" learners as well
- And of course it means not discriminating against anyone on the grounds of their basic roles
Handling of extreme cases of disruption of learning.

An instructor may have to deal with extremely disruptive individual from time to time.

Several techniques can be employed but only when the instructor feels that there is a danger of a participant getting the group completely off track.

- Confront someone and ask them to give specific examples, and deal with them.
- Ask the person to stop and take up the issue after the session.
- In serious cases, request that someone be removed from your course.
Summary

- In a group learning setting, learners have an opportunity to interact with each other to acquire and practise the elements of a subject matter and to meet common learning goals.

- The most influential model of the developmental process of groups has been that of Bruce Tuchman a five stage model (forming, storming, norming, performing and adjourning.)

- A skilled instructor needs to facilitate the group through Drucker’s seven development stages so that they become a group in the full meaning of the word as opposed to a collection of individuals

- Actions such as varying the pace, raising your voice, using humour may be need to be taken by the instructor to deal disruptive participants.

- Breaking up a training session with focus groups or brainstorming sessions may help to keep learners involved. Sometimes, an individual will need to be dealt with on a private basis, so as not to embarrass them in the group.

- It is important to remember that since learning is about change it is disadvantageous for any member to become fixed in their role within the group.
1. Identify three different types in learners and how they can disrupt the group dynamic.

1) _______________________________________________________
   _______________________________________________________
   _______________________________________________________

2) _______________________________________________________
   _______________________________________________________
   _______________________________________________________

3) _______________________________________________________
   _______________________________________________________
   _______________________________________________________

2. Describe a strategy that you may use to minimise the disruption of one of the above types of learner.

   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

3. List and explain the 5 stages of group development.

   Stage 1. ________________________________________________
   _______________________________________________________
   Stage 2. ________________________________________________
   _______________________________________________________
   Stage 3. ________________________________________________
   _______________________________________________________
   Stage 4. ________________________________________________
   _______________________________________________________
   Stage 5. ________________________________________________
   _______________________________________________________
4. Briefly describe the five elements of Drucker’s criteria for guiding goals in group work
   1) S.
   2) M.
   3) A.
   4) R.
   5) T.

5. List and provide a brief description of each of Drexler’s Seven Stages of Team Performance
   1) ______________________________________________________
   2) ______________________________________________________
   3) ______________________________________________________
   4) ______________________________________________________
   5) ______________________________________________________
   6) ______________________________________________________
   7) ______________________________________________________
Unit 3
Teaching & Assessment Methods
Unit 3: Teaching and Assessment Methods

There are many challenges presented in teaching and assessing vocational learners. In Unit 1 of this manual, it was acknowledged that there are a range of models for learning. It was also recognised that learners require methods that either lend themselves to their learning style or the task at hand. Unit 2 outlined key performance features of the vocational learner, particularly addressing their motivational needs and also identified the need for attitudinal change. Unit 2 also addressed the role of group work in the development of skill and competence outcomes and the challenges that it presents in learning process.

It has been argued that the approach to FES training should differ from the traditional models of skills training associated with construction workers, for two main reasons: Firstly, FES training will be delivered to groups from mixed trades and crafts, and secondly a large proportion of the learners will be mature as opposed to young trainee apprentices. Additionally, consideration should be given to the learner support required, as a result of the shift in responsibility for learning from the instructor to learner and also the increased emphases on attitudinal change.

The purpose of this unit is to discuss the challenges and opportunities that may have impact on the teaching and assessment methods in the FES programme. The structure is as follows:

**Section 1 - Content Delivery Methods**; considers the appropriate methods of delivery for learners in the context of FES training.

**Section 2 - Assessment Methods**; considers why we assess and provides an overview of a selection of methods for assessment.

At the end of this unit you will be able to:

1. Describe a range of training delivery methods most appropriate to the context of FES learning objectives.
2. List and describe the strategies and methods of assessment that are appropriate for verifying the attainment of specific learning outcomes at designated levels in the National Qualification Framework.
Unit 3 Section 1

Content Delivery Methods
1.1 Introduction

Learning instruction requires comprehensive planning. Effectiveness of specific approaches to learner instruction to a certain extent influences the choice of delivery method. As previously discussed, the objectives of the FES training are built upon a belief that a constructivist approach is required.

This Section will look at the practicalities of the physical makeup of the Arenas of learning. As discussed in Unit 2 Section 1, arenas are where the learning takes place, e.g., classroom, laboratories, workshops etc.

Delivery methods will also be examined, taking into account preferred learner styles. As discussed in Unit 1 Section 1 a wide range of learners benefit from delivery methods that are appropriate to the learning task at hand, even if they have a preference towards one style or model. Two challenges that are of particular importance to the delivery of FES include:

1. How to ensure that what is learned theoretically in one context may be applied effectively in another;
2. Anticipating how best learners can be taught so that they can prompt themselves to use skills learned in one context when they need to translate them for another.

Allowing opportunity for learner-tutor and learner-learner interaction, providing feedback and encouragement, and maintaining a learning environment which is respectful and inclusive for all is fundamental to catering for learner needs. This is essential when ensuring the correct selection of delivery methods. This section begins by outlining the requirements for arena such as training materials and locations. It also describes a variety of delivery methods that will be applicable to courses in FES.

At the end of this section you will be able to:

- Describe the characteristics of training materials.
- List the requirements of a training location.
- Select the appropriate delivery methods for achievement of prescribed learning outcomes.
1.2 Physical Learning Environment

The physical learning environment includes the lighting, temperature, noise levels and seating arrangements within the training arena. These play an important part in helping learners interact with each other and with the trainer. This interaction helps create learning opportunities and contributes to the overall success of the training session. The key factors for consideration in the physical learning environment include: lighting; temperature; noise levels, and; seating arrangements.

**Lighting**

Adequate lighting is necessary for learning activities. Appropriate lighting requires a balance and a flexibility that will depend on the instruction methods and type of learning activities. For example a lecture may require the light to be dimmed to make the presentation clearer.

**Temperature**

The temperature in the training room or venue must be comfortable for learners. A recommended minimum temperature range is 18°C and maximum of 26°C in the shading, where average level of clothing and activity (e.g. classrooms) takes place. (TUI, 2015) However, a comfortable temperature setting will depend on factors such as: the physical activity involved in the training session; clothing such as indoor clothing or special purpose work clothing, e.g., overalls; room ventilation etc. Extremes of heat or cold will make the training environment unpleasant, hence, interfere with effective learning. For example, learners may become uncomfortable and consequently lose interest in what you are delivering.

**Noise**

Noise levels in the training environment may interfere with learners’ ability to hear the instruction. Traffic noise, radios, noise from adjacent rooms or machinery may interfere with delivery of training content.

**Seating arrangements**

The seating configuration you choose for the learning group will influence the dynamics of the group. A classroom/lecture style set-up for example, like that illustrated in Figure 3.1, does not promote interaction and discussion among the learners. This style of seating arrangement tends to promote a formal atmosphere...
within the learning environment. In general, aim for a more open style learning environment.

![Classroom Style Layout in Rooms](image1.png)

**Figure 3.1: Classroom Style Layout in Rooms**

A more suitable seating arrangement for a training session involving adults, is the horseshoe or u-shape configuration. This configuration offers the advantage that all learners can easily see each other.

This aspect alone facilitates worthwhile interaction during discussions and question-and-answer sessions. This type seating arrangement (Figure 3.2) allows the trainer to move around inside the horseshoe to interact with learners and thus to enhance the rapport with the learners.

![U-style Seating Layout](image2.png)

**Figure 3.2: U-style Seating Layout**

Other seating arrangements that facilitate interactive learning include a semi-circle or full circle of chairs, or conference-style around a table as in Figure 3.3.
There are many methods for the delivery of the curriculum. With the development of our understanding of learning theory’s and learning styles and it is possible to come to the conclusion that a variety of approaches in the delivery of learning content works best (see Section 1.3 below). At this stage it is important to recognise that Information Technology may play a role in the delivery and where possible examples of this will be shown.

### 1.3 Outline of course delivery methods

There are a variety of delivery methods that could be used in FES courses. They may be selected based on the underpinning learning models as well as support for learner motivation. These methods include:

- Traditional lecture-based delivery
- Structured lessons
- Case studies
- Role Play
- Practical demonstrations
- Discussions
- Problem-based learning (PBL)
- Distance learning.

**Traditional lecture-based delivery**

Lecturing is a delivery/teaching method that involves, primarily, an oral presentation given by a trainer to a group of students, accompanied by some sort of visual aid, such as a slideshow (e.g. PowerPoint), a word document, an image, selection of audio, or a film.
Presentation or lecture-based deliveries are often key elements of a training event. Some trainers use aids such as a whiteboard or a chalkboard to emphasize important points in the lecture. While presentations and lectures have the disadvantage of being a passive learning activity for learners, wisely prepared and delivered, they are effective ways of presenting new knowledge-based content to learners. They allow the instructor to convey enthusiasm for the topic, to tailor the topic to the learners' needs and to emphasize points that have particular relevance for learners. They also provide an opportunity for learners to ask questions. It must note that lectures may not always be most appropriate methods if the purpose is to change attitude, in this case structured lessons and discussions may be more appropriate (Bligh, 2000).

Successful lectures require attention to three key elements:

1. Preparing the presentation.
2. Delivering the presentation.
3. Handling learner questions.

Successful presentations always have a purpose; in a training context the purpose of a presentation is to deliver training content that will help learners achieve learning outcomes. As we have previously learned, it is the structure and order for the delivery of content that heavily influences the ability of the learner to digest and encode the new information. The structure typically includes an introduction, main body of the learning content and a conclusion.

Key advantages

- **Teacher control**: Because the lecture is delivered by one authoritative figure (an instructor/lecturer) that person has full reign of the direction of the lesson and the tone of the classroom. They alone are able to shape the course, and so lectures remain highly consistent when it comes to what kind of information is delivered, and how it’s delivered.

- **New material**: Lectures are literally just long-winded explanations of information, deemed important by the lecturer. As such, students can absorb large quantities of new material.

- **Effortless**: The lecture method makes the process mostly effortless on the part of the learner, who need only pay attention during the lecture and take notes where they see fit.

- **Cost**: Can be effectively delivered to large groups.
Disadvantages

- **Learning Model:** Only 20% of information delivered by presentation or lecture is retained by listeners immediately afterwards.

- **Passive Learning:** Lectures have the disadvantage of being a passive learning activity for learners, not being actively engaged in a discussion over certain material can make the material itself seem worthless to a learner.

- **Strong speaker expectations:** The lecture method can be disadvantageous to the trainer as well. Not all trainers can be expected to have the same level of public speaking skill and being the one that is expected to do the lecturing might not be the best way for every instructor to present their course material.

Structured Lessons

As described above, the traditional lecture is delivered by one authoritative figure and that person has full reign of the direction of the lesson and the tone of the room, i.e. predominantly one-way communication.

A structured lesson on the other hand requires a collaborative approach between the instructor and a group of learners. This is the main difference between the traditional lecture and the structured lesson.

By actively involving learners through a social constructivist approach, it is possible to increase learner confidence and motivation (as considered in Unit 2 Section 1). This increases the likelihood that learning will take place. It also helps to develop the learners’ communications skills.

For effective lesson delivery in structured lessons:

- Know the learners, and their level of attainment.
- Be clear on what is to be achieved during the lesson.
- Keep the order of learning material logical and clear.
- Keep in mind the social character of the lesson (formal/informal).

Interestingly, these key points for effective lesson delivery replicate Bruner’s key principles of instruction which facilitate social constructivism (see Unit 1, Section 1). Gagne nine instructional events (as discussed Unit 1 Section 2), for example, provides a framework for the sequencing of lessons which address a number of prerequisites for learning, e.g. attention, presentation of new information, feedback, reinforcement.
It is envisaged that the delivery of the FES training will be based on the use of structured lessons. As has been explained earlier, structured lessons may include some lecturing but more importantly incorporate many deliver methods that are considered most appropriate to support the learning objectives of the FES programme. These include:

- Group activities (as outlined in Unit 2 Section 2 previously)
- Case studies
- Role play
- Practical demonstrations
- Discussions
- Problem based learning

**Case Studies**

Case studies can be a useful delivery method as a substitute for work based learning. They provide realistic simulations of the kinds of real life situations learners can expect in industry. They are particularly useful in courses of limited time as several case studies can be examined in a short period of time.

In discussing case studies and considering scenarios and possible solutions, learners can develop skills which will be transferrable to the workplace. These skills include:

- Identification of problems or challenges
- Understanding and interpreting data
- Analysing information
- Recognising assumptions and inferences
- Thinking analytically and critically
- Exercising judgement
- Taking and defending decisions
- Understanding interpersonal relationships
- Communicating ideas and opinions

There are many different ways to use case studies. How they are used will depend on the length of the course, the subject matter and upon the delivery style of the trainer.
In a short training course for example a presentation perhaps with supporting visual aids, is a really good way of providing practical examples of the theory or techniques that are being covered.

The presentation can be followed by questions and answers (Q/A) to give the learners a chance to clarify and enhance understanding. A structured Q/A session with the presenter asking questions will help to focus participants on particular aspects of the problem in the case. (Blanchard & Thacker, 2003)

It is envisaged that FES training will include case studies will be presented to learners as recommended above. The case studies will represent a collection of work of varying quality to enable learners an opportunity to appreciate the principles of best practice.

**Role Play**

The role play is a simulation of a single event or situation. Learners, who are actors in the role play are provided with a general description of the situation, a description of their roles (e.g., their objectives, emotions, and concerns) and the problem they face. The learners can act out the assigned roles in order to explore the scenario, apply skills (maybe communication, negotiation, debate etc.), and experience the scenario from another view point. It helps to make sense of FES theory and gathers together the concepts into a practical experience.

This method is particularly relevant for adult learners as it allows them to bring their prior knowledge and experience to a learning activity.

There are a variety of ways of structuring a role play activity but they all have the following characteristics:

- Definitive Aims and Objectives (is it to practice skills, explore concepts etc.)
- A defined setting/placement
- A define clear role descriptors
- A Defined time limit
- A list of observer tasks (if any)
- A debrief agenda
- A list of facilitator tasks

As with other delivery methods, role play has several advantages and disadvantages to be aware of. They include:
Advantages

- Energising activity / fun to do
- Allows learners to actively contribute
- Time efficient
- Can be used to deliver complex concepts in a simple manner

Disadvantages

- Learners may be reluctant
- Can feel threatening for some learners
- Learners can get too involved and loose objectivity
- Instructor may take sides

(Harbour & Connick, 2004)

Practical demonstrations

This method usually follows the format of a trainer demonstrating a new skill with learners observing. Demonstrations are an effective method of instructing on best practice in construction techniques. They have a significant advantage of bringing industry based examples (real life) into training activities which allows the learners to see the relevance of the training.

Figure 3.4: Instructor demonstration in a Brick & Stone class
As with all delivery methods, practical demonstrations require preparation and advance planning for successful delivery. Preparation for practical demonstrations involves a number of steps, as depicted in Figure 3.5.

**Figure 3.5: Steps for practical preparation**

It is important to remember when determining the steps involved in practical demonstrations to break them down completely. To group steps together or skip small steps may be confusing for learners. When carrying out a demonstration it is good practice to:

- Ensure that all learners can clearly see what you are doing.
- Introduce the topic and explain the purpose of the practical demonstration with reference to the learning outcomes.
- Check current knowledge of the performance of the procedure.
- Explain new terms and key points.
- Explain each step thoroughly as you demonstration of the procedure.
- Inform the learners of performance standards required.

**Advantages**

- Learners have the opportunity to observe best practice first hand in a step-by-step format.
- Often provides learners with the opportunity to touch and feel materials and tools used in practice.
### Disadvantages

- Large volumes of materials may be needed as mistakes are often made at the first attempt by students.
- The location in which the demonstration is been conducted needs to be of adequate size so all learners can observe without the need for several repetitions.

### Discussions

Discussions are an excellent method of learning and teaching through interaction with instructors and peers alike. Small group discussions are better than a whole class discussion as they encourage more pupils to give their own views through open participation. They are also easier to manage.

Learners may be divided into small groups of 4-5, given questions or tasks to discuss and then required to report back to the whole group (Lyman, 1981). This type of activity has been used extensively at workshop events for this Train the Trainer programme. The sharing of ideas and experiences are particularly relevant in FES training as it is envisaged that training will be delivered to groups from mixed disciplines i.e. electricians, plumbers, carpenters, glazers etc.

Discussions don’t always involve the presentation of new information and concepts. They also involve sharing of ideas and experiences, solving problems and promoting tolerance with understanding.

### Advantages

- It teaches interpersonal skills such as understanding and communication.
- It provides an opportunity for pupils to learn from each other, thus encouraging teamwork.
- It promotes tolerance and helps learners to understand that there are many aspects or opinions to any one topic.
- It also helps leadership, speaking and listening skills.

### Disadvantages

- Discussions can be very time consuming.
- They can be dominated by the outspoken pupils.
- Focus can easily be lost.
Problem Based Learning (PBL)

Problem-based learning (PBL) is a learner-centred model in which students learn about a subject through the experience of problem solving. Students learn strategies for dealing with problems and specific knowledge related to the learning objectives. The goals of PBL are to help the learners;

- Develop flexible knowledge.
- Learn effective problem solving skills.
- Approach learning in a self-directed manner.
- Develop effective collaboration skills.
- Improve intrinsic motivation.

Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to resolution of the problem.

The role of the instructor (known as the tutor in PBL) is to facilitate learning by supporting, guiding, and monitoring the learning process. The tutor must build a learners confidence to take on the problem through encouragement, while also stretching their understanding. This approach represents a shift from the more didactic traditional teaching methods such as lecture-based methods.

Advantages

- Promotes self-motivation and self-responsibility to learn.
- Facilitates more enjoyable and more effective learning.
- Encourages learning from experience, allowing students to use and organise what has been learnt to understand problems.
- Integrates knowledge with practice.
- Nurtures the ability to analyse problems and to identify and acquire knowledge and skills needed to deal with real-life situations.
- Develops teamwork and communication skills.
- Trains students to be reflective and assess their own work and others work also.
- Promotes independence, curiosity, and skills for self-directed, life-long learning.

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Disadvantages

- Higher time demands: PBL takes more time to teach the same content
- Change of roles: Learners have to change attitude and go from memorization of facts to an active searching for information. Instructors have to shift from dissemination of information to a tutor's and guide role.
- Increase in upfront instructor preparation time due to the formulation of appropriate problems that encompass both a large goal and specific objectives

Distance learning

In recent years, distance learning has become an increasingly popular way to provide access to educational programs and for people to learn about topics and get qualifications they might not otherwise have been able to pursue.

Distance learning occurs when there is a separation between lecturer and the learner, usually due to geographical or time concerns that prevent the learners from attending an on-campus course.

Often, electronic means are used to bridge this gap and distribute educational material though mediums such as a Virtual Learning Environment (VLE) e.g. Moodle or Blackboard.

Electronic means are used to distribute the learning material, keep learners in touch with lecturers, and provide access to communication between learners. The communicating of information is easier and more efficient than ever before and learners may find possibilities for using interactive videos, e-mail, and discussion boards to complete their lessons.

Advantages

- Possible to learn from any location.
- Increased choice of training institution.
- Lower costs in delivery.
- Flexibility for those in employment.
Disadvantages

- Lack of social interaction for learners.
- Format isn’t ideal for all learners.
- Some employers don’t accept online degrees.
- Requires adaptability to new technologies.
- Requires access to high speed broadband connection
- Not all courses required to complete the degree may be offered online.

1.4 Training Aids and Materials

As we have previously learned the use of visual learning materials helps a variety of learners to engage with the learning content. In order to be effective, learning resources need to be well designed and exhibit the principles of effective instructional design. Below is brief description of the training aids that may be used during FES training programme.

Flipcharts/Wipe boards

Flip charts/Wipe boards are both a static display tool with prepared content similar to Presentation software slides and a dynamic creation tool like a whiteboard which allows for the creation of content during the learning activity.

Hand-outs

A hand-out is a hard copy text which supports, expands on, organises or otherwise provides follow up to the learning session (Figure 3.6). It provides reinforcement of the information transmitted during the training session and it remains with the learner for a long time.

When developing hand-outs for learning it is best to think about how they might be used after the training session is over. Design them to be used to help learner remember what they have learned and to extend their knowledge further by reading material not covered in the course.
Figure 3.6: Example of a hand-out sheet for an in-class activity

**Presentation Software**

Presentation software is a computer programme which allows you to design a format, draft text and include illustrations which can then be projected as slides onto a screen for delivery as a presentation (see Figure 3.7 for sample slide). The equipment configuration varies but usually there is a desktop computer or laptop linked to a data projector.

Figure 3.7: Example of a presentation slide developed with PowerPoint software
The software will also generate a variety of documents that can be used as hand-outs or as the basis for annotated speaker’s notes. When developing presentations you can select from a broad range of backgrounds, fonts, styles and formats. The software, particularly Microsoft PowerPoint, provides some of these and they can be easily customised. An advantage of computer-based presentations is that they can be easily adapted and reused.

**Transparencies**

Transparencies are also known as Overheads or slides. They can consist of pictures or writing printed, written or drawn onto a sheet of acetate. This can be placed on the bed of an overhead projector and via light and magnification technology an image is projected onto a white wall or screen.

Transparencies can be a very robust and resilient form of visual aid as the technology is cheaper, less prone to break-down and glitches than computer technology. It is possible to write on blank transparencies, meaning they can be very responsive to classroom needs as they can be created during the training session. They are also more flexible as the order of slides can be changed during a presentation according to need.

**Videos**

Videos, DVDs and audio tapes can be useful ways of reinforcing, introducing or filling in detail on the subject being taught. These can be shown to the class and used as in conjunction with a discussion before and/or after the showing. They need be short in duration and of a professional standard.
Table 3.1: summarising where a number of instructional aids may be used with their main advantages and disadvantages.

**Table 2.1: Summary of Instructional Aids**

<table>
<thead>
<tr>
<th>Instructional Aid</th>
<th>Useful for</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flipcharts/Whiteboards</td>
<td>Recording ideas from brainstorming and feedback</td>
<td>Can be used without preparing in advance</td>
<td>Requires excellent writing skills</td>
</tr>
<tr>
<td></td>
<td>Clarifying points from oral presentations and demonstrations</td>
<td>Inexpensive</td>
<td>Can be confusing and hard to read if crammed with information</td>
</tr>
<tr>
<td></td>
<td>Making lists</td>
<td></td>
<td>Can be difficult to use without turning your back on learners</td>
</tr>
<tr>
<td>Hand-outs</td>
<td>Providing guidelines for activities</td>
<td>Provide detail for activities</td>
<td>Must be well structured and clearly written</td>
</tr>
<tr>
<td></td>
<td>Supplementing visual aids</td>
<td>Memory aids to presentations and demonstrations</td>
<td>Must be kept up to date with presentations</td>
</tr>
<tr>
<td></td>
<td>Supplementing demonstrations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PowerPoint Slides</td>
<td>Gaining attention with the use of graphics</td>
<td>Help learners remember what you say</td>
<td>Depending on technology to work</td>
</tr>
<tr>
<td></td>
<td>Providing reinforcement of oral presentations</td>
<td>Easily combine works with graphics animations videos and sound</td>
<td>Passive form of delivery</td>
</tr>
<tr>
<td></td>
<td>Emphasising key points</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transparencies</td>
<td>Gaining attention with the use of graphics</td>
<td>Can easily annotate on the day</td>
<td>Can become disorganised</td>
</tr>
<tr>
<td></td>
<td>Providing reinforcement of oral presentations</td>
<td>Help learners remember what you say</td>
<td>Difficult to keep updated</td>
</tr>
<tr>
<td></td>
<td>Emphasising key points</td>
<td>Easily combine works with graphics animations videos and sound</td>
<td>Depending on technology to work</td>
</tr>
<tr>
<td>Videos</td>
<td>Provides visual support for concepts and ideas</td>
<td>Effective in demonstrating best practice</td>
<td>Costly to develop</td>
</tr>
<tr>
<td></td>
<td>Good for demonstrating skills</td>
<td>Engaging for the learner</td>
<td>Learners may become too passive</td>
</tr>
<tr>
<td></td>
<td>Good for providing attitude training</td>
<td></td>
<td>Needs to be high quality not to distract the learner</td>
</tr>
</tbody>
</table>
Guidelines for preparing learning material

There are several factors that determine the success of learning aids. At this stage it is useful to remember the general characteristics of learners involved in the FES. They are motivated by practical and active learning, looking for opportunities to apply their learning to work-related contexts or at work, and by the use of industry-quality resources. The factors that will need to be considered when designing for these student’s include content, visibility, colours and pictures, and layout. The following section will examine these factors in more detail.

Content

There are a set of instructional design principles to consider when selecting or designing learning content to be used for delivery. This set of 12 key principles sets out research-based ways in which to engage the learner when delivered in an online format.

Mayer (2004) further refined this list to 5 key principles when delivering courses. These are:

1. The Signalling Principle -
   • People learn better when cues that highlight the organisation of the essential material are added.

2. The Segmenting Principle -
   • People learn better from a lesson that is presented in user-paced segments rather than as a continuous unit.

3. The Modality Principle -
   • People learn better from graphics and narrations as opposed to animation and on-screen text.

4. The Multimedia Principle -
   • People learn better from words and pictures, than from words alone.

5. The Coherence Principle -
   • People learn better when extraneous words, pictures and sounds are excluded rather than included.
Other useful guidelines to follow when developing content include:

- Use titles and subtitles that are informative or that summarise the text.
- Prioritise information so that the most important information is at the beginning.
- Introduce only one idea in one sentence.
- Provide descriptive examples when explaining technical words.
- Use graphics, charts and pictures to reinforce crucial facts and points.
- Deliver the same information both orally and in hand-outs.
- Simplify your words and choose standard language.
- Be direct, Avoid long sentences.
- Remember that visual aids should be used as an aid to your oral presentations and demonstrations, not as a replacement for them.

### Visibility

It is important to ensure that learners are able to see your visual aids. Keep text clear and easy to read (see Figure 3.2 for guidance). Text should follow minimum size guidelines:

- Sans serif font (such as Arial) is generally easier to read in printed matter.
- Use bullet points to emphasise the main points of your slide presentation.
- Do not put your entire lecture on the visual aid. For hand-outs, use **bold** font to emphasise points.

<table>
<thead>
<tr>
<th>Visual aid</th>
<th>Titles</th>
<th>Subtitles</th>
<th>Other text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flipchart/Whiteboards</td>
<td>7.5 cm high</td>
<td>5 cm high</td>
<td>4 cm high</td>
</tr>
</tbody>
</table>

### Colour and Pictures

It is important use colour wisely to add impact to your visual aids. Too much colour distracts, but if you use it well, it creates a mood.
Blue, for example, indicates reliability, stability and power. Green is associated with health, the environment, the outdoors. But remember that some people are colour blind to red and green, so avoid using these colours.

Be cautious when using cartoons, clipart or pictures. Too many may be distracting; used correctly they can convey a clear meaning of a point you are making in your presentation.

**Layout**

**It is important** not to cram visual aids or the pages of hand-outs with text. In general, slides should not contain more than 6 or 7 bullet points. Try to include only one main point on each slide.

For hand-outs, use double-spaced text, so they are easier to read. Allow plenty of white space (between paragraphs and in the margins) to break up blocks of text. Learners can use white space for making notes.

“We like to bring together people from radically different fields and wait for the friction to produce heat, light and magic. Sometimes it takes a while.”
Selection of training aids

A variety of instructional aids have been described in the section above detailing the advantages and disadvantages of each one. It is important to remember that instruction aids are there to support the learning process.

Aids that encourage active participation as set out in the theory of social constructivism (Unit 1 Section 1) are particularly relevant. As illustrated in Figure 3.8, providing real opportunities for the learners to engage actively with material allows them to retain more of the information. Gagne’s nine steps of instruction and Mayer’s five key principles should also be consulted.

![Figure 3.8: Levels of retention of information for different delivery methods](Image)

Figure 3.8: Levels of retention of information for different delivery methods
Summary

- Curriculum is defined as, all the learning which is planned and guided by the school, whether it is carried on in groups or individually, inside or outside the school.
- In general, a syllabus does not indicate the relative importance of its topics or the order in which they are to be learned.
- The process approach focuses on these interactions which promote learning and understanding as opposed to just teaching.
- Lecturing is a delivery/teaching method that involves, primarily, an oral presentation given by a trainer to a group of students accompanied by some sort of visual aid, such as a slideshow (PowerPoint), a word document, an image, selection of audio, or a film.
- Discussions don’t always involve the presentation of new information and concepts. They also involve sharing of ideas and experiences, solving problems and promoting tolerance with understanding.
- The role of the instructor (known as the tutor in PBL) is to facilitate learning by supporting, guiding, and monitoring the learning process. The tutor must build a learners confidence to take on the problem through encouragement, while also stretching their understanding.
- Distance learning occurs when there is a separation between lecturer and the learner, usually due to geographical or time concerns that prevent the learners from attending an on-campus course.
- By providing real opportunities for the learners to engage actively with material allows them to retain and reuse the learning material.
- Mayer’s 5 key principles when delivering content which are: signalling, segmenting, coherence, modality, and multimedia
1. Give three reasons for choosing lectures as a delivery method
   1) _______________________________________________________
      _______________________________________________________
   2) _______________________________________________________
      _______________________________________________________
   3) _______________________________________________________
      _______________________________________________________

2. What are the key points to consider when planning a practical demonstration?
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

3. List Mayer’s five key principles and give an example of each.
   1) _______________________________________________________
      _______________________________________________________
   2) _______________________________________________________
      _______________________________________________________
   3) _______________________________________________________
      _______________________________________________________
   4) _______________________________________________________
      _______________________________________________________
   5) _______________________________________________________
      _______________________________________________________
Unit 3 Section 2

Assessment Methods
2.1 Introduction

Assessment in a construction related subject can be difficult to design. All agree that reliable and valid forms of assessments are required for vocational education. This assessment should measure the level to which a learner has achieved the construction related knowledge.

Forms of assessment based on real-life scenarios, such as open-ended questions, simulations and practical demonstrations have a greater validity as it closely matches the objectives of the FES programme. There can be difficulties with these forms of assessment, such as physical availability of suitable workshops or real life situations on site. Also the evaluation of attitude change can be somewhat subjective which can lead to uniformity issues with assessments. Some standard assessment tools such as multiple choice, matching and true/false also have a role to play in assessing learner knowledge but can be difficult to design to measure high order learning.

At the end of this section you will be able to:

- Outline the reasons for assessment
- Discuss the underlying principles of assessment with regards to the issue of quality assurance.
- Select the appropriate assessment methods for measuring the attainment of the prescribed learning outcomes.
2.2 Why Assess?

There are a variety of reasons for assessing learners, with the most commonly acknowledged reason being the measurement of the learning that has taken place or the skills mastered by a learner. It is believed to be a critical element of quality assurance of a training process. It makes clear the extent to which award standards are maintained and upheld.

Assessment also provides:

- Opportunity for reinforcement of learning material
- Opportunity for learners to engage with material
- Potential to improve student retention of material
- Feedback to learners on their performance.

The opportunity for feedback is recognized in research both by learners and trainers as having the most influence on the retention of learning material. Feedback ranks higher than Direct Instruction, Instructional Quality, Student’s Prior Cognitive Ability, and Student’s Disposition to learn, on the ability for learners to acquire new knowledge (Hattie, 2009)

Further perspectives are available at: [http://www.teacherstoolbox.co.uk/T_effect_sizes.html](http://www.teacherstoolbox.co.uk/T_effect_sizes.html)

2.3 When to Assess?

Assessment can be carried out before, during, and after a course. The timing depends on the purpose of the assessment. There are three forms of assessment to consider.

1. Diagnostic assessment

Diagnostic assessment happens before a course. As a pre-test, it is a method of finding out a learner’s current level of knowledge and skill regarding a topic. In this way you can use it to identify knowledge and skills gaps.

2. Formative assessment

Formative assessment occurs during a course. Formative assessment is assessment for learning. It provides learners with opportunities to assess their performance against expected learning outcomes while the course is still in progress, so they have time for improvement. Formative assessment is often not graded, and thus provides a risk-free opportunity to ‘try out’ skills.
Formative assessment can have a diagnostic function. It is a way of alerting trainers and instructors to difficulties that learners may have. The trainer can provide feedback on performance and suggest ways to improve. The training programme may need to be modified on the basis of formative assessment results.

3. Summative assessment

Summative assessment occurs at the end of the course. In contrast to formative assessment, it measures learners’ achievement of learning outcomes for the entire course. Summative assessment forms the basis on which awards and qualifications are granted.

2.4 Principles of Assessment

Standards in assessment are used to effectively measure competence of a desired standard for the particular learning outcomes for a module. All forms of assessment should be underpinned by principles of consistency and fairness.

Consistent and fair mean that appropriate assessment which is fit for purpose and is agreed and applied consistently is provided by assessors.

The consistency and fairness of any assessment methods by can be measured by reviewing them for Validity, Reliability, Fairness, Transparency, and Practicality.

1. Validity

Validity means that assessment should measure what it is supposed to measure.

Assessment is valid when:

- It reflects stated learning outcomes.
- It is fit for purpose; for example, practical assessment is used to assess skills, written or oral assessment is used to assess knowledge and attitude.
- It is designed to provide opportunities for learners to demonstrate their level of achievement of learning outcomes.
- It facilitates reliable assessment by assessors. This means that assessment design and criteria should allow assessors to make reliable and consistent decisions.
- It is accessible to all candidates; that is, all candidates have the potential to achieve successful outcomes.
2. Reliability

Reliability refers to accuracy and consistency. Accurate assessment consistently measures what it is supposed to measure. Consistent assessment should give the same results under similar conditions every time.

Assessment is reliable when:

- It incorporates valid assessment techniques.
- Assessment criteria are aligned with learning outcomes.
- Assessment criteria and a detailed marking scheme are included in the assessment procedure.
- Assessment criteria are applied consistently when learners’ assignments and tests are being marked – different assessors mark submissions similarly.
- Assessment decisions are constant across a range of consistent conditions, contexts and a range of learners – assessors apply standards and criteria in the same way at different times.
- Assessment conditions are such that candidates, when completing assignments and tests, have minimum opportunities for cheating.

3. Fairness

Fairness refers to providing appropriate, unbiased and equitable opportunities for all learners so that they have the possibility of completing the assessment. Fairness acknowledges that different people have different learning styles and they may need different ways of demonstrating achievement of learning outcomes.

Assessment is fair when:

- Suitable resources are provided to learners to complete the assessment.
- Assessment techniques do not exclude learners from demonstrating their learning.
- Reasonable accommodation is provided in the implementation of assessment for learners with disabilities.
- Assessors are trained and advised in the fair implementation of assessment procedures.
4. Transparency

Transparency means that assessment standards and expectations are clear to all stakeholders. It means that assessment procedures, definitions and requirements are unambiguously and accurately described and detailed.

Assessment is transparent when:

- Statements regarding general expectations, assessment criteria, and guidance notes and marking systems are provided.
- Assessment guidelines are clearly written.
- The marks allocation and weighting of assessment are clearly stated.
- Deadlines and penalties for late submissions are clearly stated.
- Comprehensive guidance on completing assessments is provided.
- Guidance on examination practices is provided.
- Guidance on avoiding plagiarism and cheating is provided.
- Clear information is given on how feedback will be provided.

5. Practicality

Practicality is about the feasibility of assessment. Feasibility incorporates cost and time. It is not practical to use assessment methods that cost too much or are too time-consuming.

Assessment is practical when:

- The cost of implementing the test is not prohibitive.
- Assessment does not take far too long to implement.
- Assessment is implemented within acceptable time constraints.

2.5 Assessment strategies and marking criteria

When deciding which assessment method to use, the type of learning outcomes being assessed need to be identified (see Table 3.3). For example:

- To assess a skill a test in which the instructor observes the learner performing the skill would be best. Therefore a practical test may be best suited in order to assess the learner’s performance by observation.
- To assess a learner’s ability to interpret and analyse information on a topic a written essay may be best suited.
When developing assessment strategies it is important to remember that:

- Assessment should match the learning outcomes being assessed.
- Oral and written tests are useful methods of testing theory and knowledge.
- Practical tests are useful in the assessment of skills and processes.
- Observation is useful for assessing attitude.

**Table 3.3: Assessment methods applicable for types of learning outcomes**

<table>
<thead>
<tr>
<th>Type of Learning Outcome</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge based</td>
<td>Written or Oral tests</td>
</tr>
<tr>
<td></td>
<td>Essay</td>
</tr>
<tr>
<td></td>
<td>Multiple Choice</td>
</tr>
<tr>
<td>Skill based (practical)</td>
<td>Practical skills</td>
</tr>
<tr>
<td></td>
<td>Portfolio</td>
</tr>
<tr>
<td>Skill based (interpersonal)</td>
<td>Role play</td>
</tr>
<tr>
<td></td>
<td>Case Study</td>
</tr>
<tr>
<td></td>
<td>Oral Interview</td>
</tr>
<tr>
<td>Attitude</td>
<td>Role Play</td>
</tr>
<tr>
<td></td>
<td>Case Study</td>
</tr>
<tr>
<td></td>
<td>Oral Interview</td>
</tr>
<tr>
<td></td>
<td>Portfolio</td>
</tr>
</tbody>
</table>

**Assessment criteria and marking**

Assessment criteria describe what the learner is expected to be able to do in order to demonstrate that they have achieved the learning outcomes.

Objective assessment criteria are the criteria used by the assessor when marking and grading learners’ submissions. The mark awarded for each element of the assessment must be clear.

Marks are allocated according to their weighting. Weighing is related to factors such as importance and difficulty. Therefore marks allocation is weighted to reflect the relative importance and difficulty of each element of the assessment.

Objective assessment criteria must:

- State what the learner must complete to demonstrate achievement of learning outcomes.
- Be consistent with the learning outcomes of the module or course being assessed.
- Adopt consistent vocabulary so that consistency remains a pillar of assessment.
- State the weighting of the assessment in the context of the module being assessed.
- State the mark that is allocated for each criterion.

**Rubrics**

As well as objective assessments as described above, certain outcomes may need to be measured in a more subjective manner. This subjective assessment relies on the instructors professionally developed experience. This may be essential in ensuring that the assessment is measured with validity.

> Some criteria of achievement, such as complex thinking and contextually-sensitive performance, cannot really be measured with validity by objective ratings; valid assessment of such qualities requires the developed subjective awareness of an experienced professional.

*Lane, 2010*

Hence the challenge is to give subjective assessments more reliability. It is acknowledged that marking rubrics have a value in structuring the subjective component of the instructor's assessment of a learners work.

Stevens (2013) defines a rubric as a set of criteria and standards typically linked to learning objectives. It may be used to assess or communicate about product, performance, or process of a learning task.

Development and use of a rubric can increase reliability in subjective assessment. When translating your grading policy into specific assignments, you want to ground your subjective judgment. A rubric can be created that is consistent with your marking criteria and also clear enough for students to understand it and includes feedback.
2.6 Types of Assessment

The previous sections have dealt with issues concern with quality assurance and marking criteria. The following section will describe actual assessment strategies that may be used in assessing the learners on FES training.

Written tests

Written assessments are activities in which the student selects or composes a response to a prompt. In most cases the prompt consists of printed materials (a question, images, tables, graphs or a combination.

The assessment is usually at a fixed time within a specified time frame. The constraints on the learner i.e. (fixed date and time allocated, plus the same questions) set them up a standardised result which may then be compared against norms.

Advantages

- Relatively economical, convenient.
- Equitable treatment for learners.
- Less opportunity for cheating.
- Revision process can develop.

Disadvantages

- Stressful, encourages surface learning.
- Tests exam technique not learning.
- Snapshot of performance.
- Does not encourage continuous study.

Multiple choice

In multiple choice assessments a learner is given a question with a selection of answers with one or more responses being correct. Multiple Choice offer a quick and efficient tool for assessing a large range of material. Though normally used for ascertaining factual knowledge they can be used to assess higher order thinking and problem solving skills.

Advantages

- Can spend time designing rather than marking assessments.
- Relative simplicity of inputting questions.
- Provision of immediate feedback to students automatically.
- Students can be given many opportunities to repeat a formative assessment, or take the assessment when they feel ‘ready’.

### Disadvantages

- An element of chance can allow students to arrive at the correct answers and pass the assessment.
- Care must be taken in the design of questions and the inclusion of high quality distracter incorrect answers. Common misconceptions and errors are useful for distracters.

### Essay

Essays are lengthy written responses to questions or situations that allow a learner an opportunity to show their knowledge in a detailed manner. This is a commonly-used assessment method and there two varieties:

1. Unstructured questions, also known as free-response questions. Learners have maximum freedom for discussion.
2. Structured or restricted-response questions. The learner is given far less freedom to determine the nature and scope of the response. Often, the questions guide both the structure and the content of the expected response.

### Advantages

- Develops learner’s writing skills.
- Requires learners to be able to develop structured arguments.
- Allows examination of learner’s understanding of key elements of the module.
- Encourages learners to reflect and engage in deeper learning than some other assessment methods.

### Disadvantages

- Essays can be particularly challenging for learners where English is their second language.
- Can be difficult for learners with dyslexia and other learning issues.
- They are time consuming for instructors to mark.
- It can be challenging to ensure fairness.
A learners writing ability as much as their knowledge of the area is being tested.

**Oral tests/interviews**

The oral assessment is a practice in many schools and disciplines, where an examiner poses questions to the learner in spoken form. The learner has to answer the question in such a way as to demonstrate sufficient knowledge of the subject in order to pass the exam.

**Advantages**

- Learners are given an opportunity to expand on issues raised in a practical examination.
- Highly effective means of measuring language competence and skill.
- Plagiarism is not possible.
- Often an attractive alternative for students whose written skills in examination/assessment are not particularly strong.
- Works particularly well in practice situations.

**Disadvantages**

- Can be stressful for the learner.
- Time consuming and expensive.
- May present difficulty for shy or inarticulate learners.
- May present difficulty for learners whose first language is not the language in which the oral is conducted.

**Portfolios**

Portfolios are a cumulative assessment showing that the learner has achieved several learning outcomes. The portfolio could be a collection of a variety of assessment types used to give a fuller picture of a learners understanding of a subject. There are different types of portfolios:

1. Learners submit examples of their best work.
2. Learners submit all of their work.
Advantages

- Promotes learner self-evaluation, reflection, and critical thinking.
- Measures performance based on genuine samples of learner work.
- Provides flexibility in measuring how learners accomplish their learning goals.
- Facilitates cooperative learning activities, including peer evaluation and tutoring, cooperative learning groups, and peer conferencing.

Disadvantages

- Requires extra time to plan an assessment system and conduct the assessment.
- Gathering of all the necessary data and work samples can make portfolios bulky and difficult to manage.
- Marking portfolios involves the extensive use of subjective evaluation procedures such as rating scales and professional judgment, and this limits reliability.

Practical tests

This form of assessment consists of real life hands on activities that allow a learner to demonstrate their competence to carry out a practical activity. This assessment type covers an assortment of activities such as creating an artefact, conducting an experiment, analysing data, producing reports, and presentation results.

In a vocational context many assessments are based on practical testing of performance related assessments of job related skills.

Advantages

- Simulates authentic experience.
- Provides opportunity for feedback on wide range of skills.
- Enables practice before real situation.
- Shared responsibility for tasks.

Disadvantages

- Difficult to organise.
- As a one off exercise, can be stressful.
- Requires explicit assessment criteria for judging performance.
Methods of assessing attitudes

With a focus on developing craft workers and in particular the changing of attitudes in relation to low energy building it is important to be aware to select relevant assessment tools that can measure attitude change. There are two particularly relevant approaches to this:

1. Written surveys and questionnaires (asking individuals to share their perceptions of their own or others' attitudes and behaviours including direct or mailed, signed or anonymous).
2. Exit and other interviews (evaluating reports of subjects' attitudes and behaviours in a face-to-face interrogative dialogue).
Table 3.4 present many of the typical assessment methods, the requirements of the learners and the corresponding learning outcomes.

**Table 3.4: Examples of assessment methods (Adapted from (Nightingale, et al., 1996))**

<table>
<thead>
<tr>
<th>Examples of Assessment</th>
<th>What is required from learners?</th>
<th>Types of Learning: Learning outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essay \ Report</td>
<td>Development of arguments, reflection, judgment, evaluation</td>
<td>Thinking critically and making judgments</td>
</tr>
<tr>
<td>Problem scenario \ Group Work \ Work-based problem \ Evaluate a case</td>
<td>Identify problems, define problems, analyse data, review, design experiments, plan, apply information</td>
<td>Solving problems/developing plans</td>
</tr>
<tr>
<td>Demonstration \ Role Play \ Make a video (write script and produce/make a video) \ Produce a poster \ Lab report</td>
<td>Take readings, use equipment, follow laboratory procedures, follow protocols, carry out instructions</td>
<td>Performing procedures and demonstrating techniques</td>
</tr>
<tr>
<td>Written examination \ Oral examination \ MCQs \ Essays \ Reports \ Short answer questions \ Mini tests</td>
<td>Recall, describe, report, identify, recognise, recount, relate, etc.</td>
<td>Demonstrating knowledge and understanding (can be assessed in conjunction with the above types of learning)</td>
</tr>
<tr>
<td>Learning journal \ Portfolio \ Learning Contracts \ Self-evaluation \ Group projects \ Peer assessment</td>
<td>Work co-operatively and, independently, be self-directed, manage time, manage tasks</td>
<td>Managing/developing yourself</td>
</tr>
<tr>
<td>Design project \ Portfolio \ Presentation \ Performance</td>
<td>Design, create, perform, produce, etc.</td>
<td>Designing, creating, performing</td>
</tr>
<tr>
<td>Library research assignment \ Data based project</td>
<td>Information search and retrieval, investigate, interpret, review information</td>
<td>Assessing and managing information</td>
</tr>
<tr>
<td>Written presentation \ Oral presentation \ Discussions /Debates/ role plays \ Group work</td>
<td>Written, oral, visual and technical skills</td>
<td>Communicating</td>
</tr>
</tbody>
</table>
Summary

- Assessment is the process of defining, selecting designing collecting analysing interpreting information to increase a learners learning and development.
- There are three specific types of assessment depending on when the assessment takes place, diagnostic happens before, formative during, and summative occurs at the end of training.
- Subjective assessment relies on the instructors professionally developed experience. This may be essential in ensuring that the assessment is measured with validity.
- Essay can be in two forms, free-response questions (unstructured) or restricted-response questions (structured)
- Marking rubrics have a value in structuring the subjective component of the instructor's assessment of a learners work.
- Written surveys, questionnaires and interview are recognised as effective ways to assess attitudes.
M1.U3.S2 Progress Check

1. List and explain four reasons why assessment is necessary.
   1) _______________________________________________________
   2) _______________________________________________________
   3) _______________________________________________________
   4) _______________________________________________________

2. List the five headings under which assessment methods can be reviewed for consistency and fairness.
   1) _______________________________________________________
   2) _______________________________________________________
   3) _______________________________________________________
   4) _______________________________________________________
   5) _______________________________________________________

3. Give one example of an assessment strategy that you have used in your own teaching practice and review it under the five headings from question 2.
   a) _______________________________________________________
   b) _______________________________________________________
   c) _______________________________________________________
   d) _______________________________________________________
   e) _______________________________________________________

Unit 3 Section 2
References


Goodwin, K., 2014. careernotes.ca. [Online]
Available at: http://www.careernotes.ca/unit1/4-multiple-intelligences/


Available at: http://www.businessballs.com/roleplayinggames.htm
[Accessed 13 January 2015].


Available at: http://www.pdx.edu/sites/www.pdx.edu.cae/files/media_assets/Howard.pdf


[Accessed 12 January 2015].


[Accessed 19 November 2014].


