Teaching and Learning in Further and Higher Education:

A Handbook by the Education for Employment Project

Teaching and Learning in Further and Higher Education:

A Handbook by the Education for Employment Project

Acknowledgements

The Education for Employment Development Partnership Committee wish to express their sincere appreciation to the following in recognition of their contribution to this handbook.

Dr Donal McAnaney
Dr Ger Craddock, Centre for Universal Design
Ms Dawn Duffin, National Learning Network
Mr Damian Gordon, Dublin Institute of Technology
Mr Ciaran O Leary, Dublin Institute of Technology
Mr Ger Whelan, Killester College of Further Education

A special word of thanks to Georgina Lawlor, E4 Project, Curriculum Development Officer for all of her hard word in the compilation and editing of the handbook.

Also to the Project Co-Ordinator, Mary Gaffney and all the tutors and students who have contributed to the project.

We would also like to acknowledge the support the Education for Employment Project has received from the European Social Fund, the Department of Enterprise, Trade and Employment and the WRC Social and Economic Consultants.

Lisa McCormack
E4 Project Manager
www.E4project.ie

foreword

'*Carry out different teaching for different students*'- Ancient Chinese Proverb

The Education for Employment Development Partnership Agreement was signed on the 1st June 2005. The two and a half years since the project began have been a unique learning experience for all involved.

The six organisations comprising the Irish partnership for the Education for Employment Project are:

- Central Remedial Clinic
- DIT Kevin St
- National Learning Network
- Killester College of Further Education
- Institute of Technology Blanchardstown
- Center for Independent Living

The partners have engaged in an array of activities which took place within the project to meet the aim of developing high quality, flexible and supported life-long learning pathways to employment for individuals from target groups that have been traditionally excluded from the labour market.

One of the key questions the project partners sought to address was, 'how do we create and develop inclusive learning environments that will enable learners to maximise their learning potential?' Central to answering this question was a recognition that all individuals learn and process information in different ways.

During the lifespan of the project training was delivered across all DP member organisations that provided participants with a range of strategies to support differentiated instruction, teaching and learning methodologies and inclusive learning.

A key learning point from the training on the various differentiated instruction teaching and learning methodologies is that participants require time to reflect on the methodologies introduced and contextualise these within an overall theoretical framework of adult and adolescent learning.

To support educators this handbook has been produced. This resource contains an outline of the main theories that inform further and higher education, information on how we learn and a range of practical strategies that educators can use to support inclusive learning and differentiated instruction.

We hope that you find this handbook a useful resource that can be dipped into time and again, as for us in the E4 Project, it provides the theoretical framework and practical strategies that have underpinned the dynamic and innovative approaches taken within the project to support inclusive teaching and learning at further and higher education.

Best Wishes,
The Education for Employment Development Partnership Committee

EUROPEAN SOCIAL FUND:
helping develop employment by promoting employability, the business spirit and equal opportunities and investing in human resources

COMMUNITY eQUAL INITIATIVE

An Roinn Fiontar, Trádála agus Fostaíochta
Department of Enterprise, Trade and Employment

table of contents


THE
E4
PROJECT
EDUCATION FOR
EMPLOYMENT

Section 1: Learning and Development Across the Lifespan

Section 1: Learning and Development Across the Lifespan

What's my motivation?

The objective of this section is to explain our interpretations of 'learning' and 'development' so that when we discuss ideas about, and approaches to learning and teaching throughout this handbook we will all have a shared understanding of what we mean.

Learning can be defined as a cognitive process of acquiring skill, knowledge, attitudes or the accumulation of habits of perceiving, thinking and acting. For learning to take place, it is no longer considered sufficient that knowledge be broken down into small chunks for students to digest mentally. Learning is now considered to occur through active engagement with material in a meaningful and genuine context and involves the linking of new knowledge with previous understanding. We learn best not by passively absorbing knowledge, but by making sense of the world and building our own connections. This type of learning gives students a deeper understanding of what is learned and helps them to remember and to take ownership of it. Learning is a search for meaning. Therefore, learning must start with the issues around which students are actively trying to construct meaning.

In contrast, development involves movement from one state to another. As a result it is generally about transitions. Development is also understood to have some lasting impact and to refer to growth and progression. While it is possible to document physical growth through the lifespan, it is more complex to describe other aspects of development such as the development of personality. A useful definition has been proposed by Rutter and Rutter (1992). They propose that development in relation to humans be characterised as the systematic, organised, internal change that is clearly associated with age-related progression and that has some implications for person's functioning at a later stage. Development has often been described using the concept of stages (e.g. Piaget, Erickson, and Kohlberg). This section provides a number of proposals as to how development progresses throughout the lifespan.

While it is possible to distinguish between learning and development in an abstract way, it is more difficult to specify what changes in behaviour and action can be attributed to development and which ones contribute to learning. For example, young children between the ages of two and seven have the capacity to learn a vocabulary of many thousands of words. The speed and ease of acquisition of language for most children is very difficult to attribute solely to learning and thus there is clearly a developmental aspect. On the other hand, there are also many indications that the environment within which the child is growing has a significant impact on language acquisition.

The key aspect of the learning/development dichotomy from a lifespan perspective is that it is possible to identify that the role of development and particularly biological development changes as we grow older. The best way to approach learning and development across the lifespan is to see development as having a particularly powerful and positive role in the learning of younger people and that its role becomes less powerful and in later years can play a negative role as memory and attention become less efficient. Young people bring to the learning process a wide range of information processing advantages that include faster reactions times, more efficient perceptual processing and even more acute auditory and visual reception. Older learners can no longer rely on these assets and have instead to become more strategic in the way they learn. A particularly important advantage that older learners have over younger learners is that they have a more elaborated and extensive knowledge of the world. If learning is about the storage and retrieval of information and facts, then the more relevant and elaborated your world knowledge is, the easier it

is for you to classify and integrate it into your repertoire of knowledge. The younger a learner is the less developed is his/her knowledge and thus it is necessary to build a knowledge base into which to integrate new learning. The key challenge for younger learners can be described as 'accommodation'. They are often faced with information for which they have no previous reference point and as is often demonstrated in developmental psychology they are faced with phenomena and facts for which they have no 'frame'. A frame is a set of inter-related concepts which make up a way of viewing events or object in the external world. Thus when a young person is trying to understand interest rates he/she is disadvantaged by never having taken out a mortgage. The task for the young learner is to change their existing frames (world knowledge) to 'accommodate' to the new information. Many older learners will have had the experience of tracking interest rates. They can 'assimilate' the knowledge into their existing frames. Piaget proposes that 'accommodation' and 'assimilation' are at the heart of the dynamic interaction of learner with the external world. Assimilation is integrating new knowledge into the existing world knowledge whereas accommodation is about adjusting your existing view of the world on the basis of the new learning.

While it is clear that being inexperienced in the world and having a relatively sparse set of frames with which to interpret the external world represents a disadvantage in learning. The opposite is not always the case. In fact inappropriate or irrelevant world knowledge can actually form a significant barrier to learning for adults. The initial strategy of choice for most adult learners adopt is to attempt to assimilate new knowledge. That is they attempt to integrate new learning into their existing set of frames for 'working the world'. However, if the new knowledge is incompatible with the new information or with existing habits of behaviour or thinking then, learning becomes more difficult and requires a 'perspective transformation' on the part of the learner. One example of where the 'legacy' of prior knowledge and experience can interfere with the acquisition of new knowledge is in relation to information and communications technologies. Younger learners have no preconceptions about the world of technology, whereas adults have acquired many constructs that are either irrelevant or incompatible with learning how to use technology. Thus adults bring a legacy of habits of perceiving, acting and thinking to the learning context that is not always useful in dealing with technology. Facilitating a 'perspective transformation' on the part of an adult learner requires a different approach to education than that has evolved for younger learners. As a result a number of thinkers have proposed theories and practices for adult education (Mezirow, Friere etc.).

The adolescent learner shares many of the advantages of both younger and older learners. Developmentally they are still equipped with the physiological basis for rapidly and efficiently processing information, while also having a substantially developed set of frames for working the world. They are a learner in transition and have begun to apply their learning assets in function of their own aspirations and desires. Teenagers are well equipped to 'cram' for exams and can equally apply a range of logical and rational techniques to processing information. This is probably the most frustrating characteristic of the adolescent learner for teachers. Adolescents are dealing with a range of issues in terms of identity, role confusion (e.g. Erikson) and separation from their families. They bring to this a set of well developed and sophisticated learning strategies to deal with formal operations, knowledge transfer, complex problem solving, planning and conceptualising. In addition, adherence to their peer group is all important and being 'different' is problematic.

When it comes to skill acquisition it is easier to see the interaction of development and learning. It is a given that the timely introduction of children to tasks that require significant manual dexterity and coordination is essential if they are to attain proficiency. This is demonstrated often in the fields of sport and music. Nevertheless, skill acquisition is also dependent on practice and innate aptitudes. Adults who embark upon skill acquisition projects can gain significant satisfaction and achieve relatively high levels of performance (e.g. golf), but the likelihood of attaining expert status is much lower than for a younger learner. It is important to note that it is widely accepted that young learners

must have reached a certain level of development prior to being introduced to certain skill acquisition tasks.

One of the key assets of older learners is their knowledge of themselves and the way in which they learn. This information is integrated into their world knowledge and it informs the way in which they interact with the world and influences the way in which they approach learning tasks. Learners who have developed an understanding of their own learning style are better able to approach new information and adjust the way they act to new knowledge. With the advent of the information society this type of knowledge is equally important for younger learners. The emphasis nowadays has begun to shift from acquiring a mastery of facts (i.e. frontloading knowledge or knowledge banking) to the view that all learners need to developing 'thinking skills' to allow them to analyse and evaluate the information surrounds them. These transferable thinking skills can enable learners of all ages to develop lifelong learning skills.

Thus today's children need to learn the skills that will help them in today's job market and today's society. They need to learn how to make decisions on their own, work well with others and sift through vast amounts of information. Today's adults need to learn how to let go of many of the concepts that they acquired when growing up in the world that existed prior to the advent of the information society and today's teenagers need to learn how to seek help from adults who are in many respects less equipped to deal with the information society than they are themselves.

One term that encapsulates much of what is required across the life span is 'metacognition'. This refers to the ability of an individual to reflect upon and monitor his/her own level of knowledge and to choose appropriate learning strategies to suit a learning task. While there is no universal agreement on a precise definition for what is variously termed metacognition, higher-order thinking, critical thinking, creative thinking or thinking skills, it is possible to identify a number of theorists and theories as being of particular importance to learning and thinking skills.

In a recent study of the impact of teaching thinking skills on teachers, Baumfield (2006) found that "the change in practice reflects the shift in focus to exploring the processes of learning and this requires the teacher to be a facilitator rather than an instructor". This same shift is one that has been recommended for many years for adult educators and is reflected in the approaches developed in the areas of community development and adult literacy.

This shift in role with the teacher moving from "sage on the stage" to "guide on the side" can create tensions and threaten the existing teacher competences as expressed by the following teacher who becomes 'stuck' when trying to plan a 'thinking skills' lesson on a topic she has taught many times before:

'Now I am thinking that before each lesson I must think what is my purpose in each question I intend to ask.' (Zohar, 1999, p. 425).

However, the benefits are also clearly articulated by teachers in a number of the studies.

I've learned a lot just from listening to some of these kids. I'm thinking, WOW, I never figured it out that way. (Franke et al., 1998, p. 78).

'It's exciting to see the 'light bulb' go on.' (Hojnacki & Grover, 1992, p. 8).

Educators of all ages, working with learners of all ages, must face up to the necessity of integrating thinking-skills approaches into their existing schemes of work. While previously curriculum based approaches required teachers to focus on the key concepts in the subject or topic which they were teaching, it is now accepted that there must be an equal emphasis on learning processes, learning strategies and self-reflection. In addition to being able to identify and discuss issues in teaching and learning across subject disciplines and across phases of education, educators must be able to adjust their emphasis and techniques not only to the diversity arising from learning styles but also to the diversity of age.

This is particularly clear in the area of literacy. The approach that an educator will adopt with a five year old confronted with visual language (text) for the first time must of necessity differ from the approach adopted by an educator working with a teenager who has failed to acquire literacy the first time around. Equally, the approach adopted by an adult educator to literacy will reflect not only the developmental stage of the learner but also the habits of thinking, acting and perceiving that the adult learner has accrued over his or her lifetime. Within the life experience and world knowledge of all learners is embedded the concept of themselves as learners. For those younger learners embarking on the exciting world of knowledge acquisition this is in the process of construction and thus there is a responsibility on the educator to assist in enhancing the self concept of the learner. For adolescent learners it may well be that the self concept of the learner is in need of repair or reassurance. For adult learners there are two distinct problems. On the one hand there are those adults who have successfully negotiated the transition to adulthood with learning strategies and habits that are ill-fitted to the demands of the information society or to their changed role in that society (e.g. older women returning to learning). On the other hand, there are those adults who have returned to learning after accumulating years of negative learning experiences in formal education. Both types of adult learners must transform their views of themselves as learners and as citizens within their communities. The role of the adult educator must be to enable this transformation. It is legitimate to propose that without such a transformation substantive adult learning is unlikely to occur.

The role of the educator in the learning process is in question when viewed from a metacognitive perspective. From this perspective, the educator, even at an early stage of development, must have as one of his/her learning objectives to make him/herself redundant. Effective learning is achieved by the graduated withdrawal of learning support to learners while they engage in the activity or process that is the focus of the learning process. Educators at primary level have a relatively stable position in the learning process. At later developmental stages educators have a greater responsibility to encourage learner independence. This is achieved most effectively by assisting learners to develop a capacity for self-reflection both on themselves as learners and on their position within society and the community. Ultimately, educators have an effect on everyone's life in one way or another. Thus educators' characteristics and styles are critical. However, they need to be considered in context with what learners bring to the learning environment.

Some learners will benefit more from structure than others and some educators may be able to handle flexible teaching better than others. The extent to which these elements shift in emphasis depends upon the developmental stage of the learner and what is to be learnt.

This section is designed to provide educators dealing with more mature learners, i.e. adolescents and adults, with a brief overview of a range of theories and approaches that could prove useful in developing more responsive and targeted strategies.

1. Key Themes of Adult Learning

What's my motivation?

In this section we will look at different models of learner development, including; Piaget, Havighurst's six stages of human development, Erikson's Stages of Emotional Development, and Baltes Model of Human development. Following that a discussion of the main feature of lifelong learning is presented.

There are a number of different ways of thinking about development. It certainly has a biological dimension that occurs in generally predictable, sequential stages over time. This perspective leads many educators, families and carers to assume that while young children acquire knowledge naturally and automatically as they grow physically and become older, provided that they are healthy, development ends somewhere between adolescence and adulthood. A lifespan approach to development acknowledges that development is a process that is lifelong and that, while physiological development can be characterised by a U-shaped curve in terms of such indices as reaction times and short term memory, other developmental changes are equally relevant. Development, defined as a change that has 'some degree of carry forward' occurs in many domains of human endeavour over the lifespan. Viewing development as something that transcends biological development is critical to understanding how to impact on the habits of thinking, acting and perceiving of mature learners.

In contrast to the biological view of development, the learning theorists placed significantly more emphasis on an environmentalist perspective of development. This approach posits the view that the environment shapes learning and behaviour; in fact, human behaviour, development, and learning are characterised in terms of reactions to the environment. This perspective leads to the conclusion that education can transcend the developmental stage of the learner but it creates the learner as a passive objective within a largely determining environment of which educators, families, institutions, and peers are a large part. It assumes that learners develop and acquire new knowledge by reacting to their surroundings, but does not differentiate between the learning experience of the learners and appropriateness of educational strategies.

From the perspective of developmental child psychology, "kindergarten readiness" is the age or stage when young children can respond appropriately to their environment. From the perspective of adult education these conditions have to be created by the educator working in cooperation with his/her learners.

At this stage it is generally accepted that that learning and development occur, for people of all ages, through an interaction between the environment, including other people, and personal factors. This approach views learners, even young learners, as active participants in the learning process. From this perspective even young children initiate most of the activities required for learning and development. It is not so clear that more mature learners exercise a similar initiative and yet because active interaction with the environment and people are necessary for learning and development it is essential that motivational technique are part of the educator.

1.1 Stage theories in human development

One of the most influential stage theories of development was proposed by Jean Piaget. He proposed that what distinguishes human beings from other animals is the ability to do "abstract symbolic reasoning." Piaget's views are often compared with those of Lev Vygotsky (1896-1934), who looked more to social interaction as the primary source of cognition and behaviour. Piaget is renowned for constructing a highly influential model of child development. His views on how children's minds work

and develop have been enormously influential, particularly in educational theory. Piaget's theory is based on the idea that the developing child builds cognitive structures - in other words, mental maps, schemes, or networked concepts for understanding and responding to physical experiences within his or her environment. His particular insight was the role of maturation (simply growing up) in children's increasing capacity to understand their world. They cannot undertake certain tasks until they are psychologically mature enough to do so. He proposed that children's thinking does not develop entirely smoothly. He postulated certain points at which it "takes off" and moves into completely new areas and capabilities. He saw these transitions as taking place at about 18 months, 7 years and 11 or 12 years. This has been taken to mean that before these ages children are not capable (no matter how bright) of understanding things in certain ways, and has been used as the basis for scheduling the school curriculum.

Piaget's theory is based on the idea that the developing child builds cognitive structures, in other words, mental "maps," schemes, or networked concepts for understanding and responding to physical experiences within his or her environment. Piaget further attested that a child's cognitive structure increases in sophistication with development, moving from a few innate reflexes such as crying and sucking to highly complex mental activities.

Piaget identified four stages in cognitive development:

1. **Sensorimotor stage (Infancy)**: In this period (which has 6 stages), intelligence is demonstrated through motor activity without the use of symbols. Knowledge of the world is limited (but developing) because it 's based on physical interactions / experiences.

2. **Pre-operational stage (Toddler and Early Childhood)**: In this period (which has two sub-stages), intelligence is demonstrated through the use of symbols, language use matures and memory and imagination are developed, but thinking is done in a non-logical, non-reversible manner. Egocentric thinking predominates.

3. **Concrete operational stage (Elementary and early adolescence)**: In this stage (characterised by 7 types of conservation: number, length, liquid, mass, weight, area, volume), intelligence is demonstrated through logical and systematic manipulation of symbols related to concrete objects. Operational thinking develops (mental actions that are reversible). Egocentric thought diminishes.

4. **Formal operational stage (Adolescence and adulthood)**: In this stage intelligence is demonstrated through the logical use of symbols related to abstract concepts. Early in the period there is a return to egocentric thought. Only 35% of high school graduates in industrialised countries obtain formal operations; many people do not think formally during adulthood.

Piaget outlined several principles for building cognitive structures. During all development stages, the child experiences his or her environment using whatever mental maps he or she has constructed so far. If the experience is a repeated one, it fits easily, or is absorbed into the child's cognitive structure so that he or she maintains mental balance. If the experience is different or new, the child loses equilibrium, and alters his or her cognitive structure to accommodate the new conditions. This way, the child erects more and more cognitive structures.

Havighurst's six stages of human development:

1. Infancy & early childhood (Birth till 6 years old)
2. Middle childhood (6-12 years old)
3. Adolescence (13-18 years old)
4. Early Adulthood (19-30 years old)
5. Middle Age (30-60years old)
6. Later maturity (60 years old and over)

He also proposed three fundamental human tasks that are critical at every level of development. Firstly, tasks arise from physical development. At an early age learning to walk talk and control of bowel and bladder; in adolescence, learning to relate effectively to the opposite sex; and in later adulthood to adjusting to menopause. Secondly, there are those tasks that arise from personal values such as at an early age choosing the right toy; in adolescence choosing the right music and attire; in early adulthood searching for the right partner and occupation; and subsequently trying to figuring out ones philosophical outlook. Thirdly, there are those tasks that have their source in the pressures of society including at an early age learning to read; in adolescent learning how to differentiate oneself from both family and peers; in early adulthood how to maximise personal, economic and social status and subsequently how to be responsible citizen.

The developmental tasks model is age dependent.

1. From 0-6 years some of the key tasks include learning to walk, crawl, take solid food and control the elimination of body wastes. This period of development also involves social learning in terms of gender identification and relationships and cognitive tasks such as reading readiness, conceptual development and language development.

2. From 6-12 years learning challenges progress to physical skills, getting along with peers, developing a positive self-concept, developing appropriate social roles and world knowledge, developing a scale of values and attitudes toward social groups and institutions.

3. From 12 -18 years learning is more socially focused. It is about achieving new and more mature relations with age mates of both sexes, developing an appropriate social role, learning to live with your body, becoming emotionally discrete from parents and other figures of authority, developing a set of values and an ethical system as a guide to behaviour, being popular.

4. From 18-30 years the learning challenges transform and the stakes become higher. This phase of development involves attracting a mate; learning to live with him or her; starting a family, or not, and dealing with the consequences; kick starting a career; hanging on to your friends and finding a congenial social group.

5. From 30-60 years life challenges become exceptionally other oriented. In the immediate sphere of development it is about accepting and adjusting the physiological changes of middle life, in social terms it is about supporting dependency relationships such as assisting teenage children to become responsible and happy adults or assisting one's parents to age with dignity. In broader terms social, family and community responsibilities represent a particular challenge. In parallel, there is the challenge of reaching and maintaining one's own career and developing satisfactory leisure time activities, while simultaneously maintaining a constructive relationship with one's partner as a person.

6. From 60 years on learning challenges arise from adjusting to decreasing physical strength and health; retirement and reduced income; bereavement; establishing an explicit affiliation with one's age group; developing constructive social roles in a flexible way and establishing satisfactory physical living arrangements.

Havighurst provides a time-bound but very precise insight into the lifespan challenges of learners. It is clear that the approach and emphasis are informed by the times within which he wrote. Nevertheless, many of the issues and learning challenges he identified are still very relevant to people growing up in the Information Society. The main contribution of his description of stage development is that it acknowledges that development is life long and that most learning challenges are above and beyond the technical domain of life.

Erikson's Stages of Emotional Development

Models of lifespan development are many but some have a unique perspective. One of these is the lifespan developmental perspective of Erikson. The key contribution of Erikson is that he expanded the Freudian view that emotional development was determined at a relatively early age to a lifespan perspective in which each stage represents a dilemma that must be resolved if a healthy lifespan transition is to be achieved. The early stages of Erikson's classification are very similar to those proposed by Freud but apply the concept of developmental conflict to other crucial age relevant dilemmas that are extremely relevant to educators working with more mature learners.

Erikson's stages cover birth to old age from an emotional perspective and as such are more relevant to the practical-communicative and emancipatory-critical domains of learning, nevertheless they help to emphasise the developmental differences that learners bring to the educational contract.

1. **Infancy (Birth-12 Months)** – The Dilemma: Trust vs. Mistrust
   The main tasks of this stage are to develop attachments, maturing in terms of sensory, perceptual, and motor functioning. A successful outcome of this period is the development of trust. It is a lifelong task.

2. **Younger Years (1-3 Years)** – The Dilemma: Crisis: Autonomy vs. Shame and doubt
   The child's main challenges during this phase include getting around, developing language, learning how to play and developing self-control. The key concern is whether the child can balance his/her need for help with a desire to be independent.

3. **Early Childhood (3-5 Years)** – The Dilemma: Initiative vs. Guilt
   The main challenges of this stage include developing a healthy ego, a moral basis for action, gender- role identification, engaging in group play and a robust self-esteem. Successful outcomes for this stage include an enjoyment of learning, an ability to initiate activities, a creative imagination and the commitment to pursue personal aspirations.

4. **Middle Childhood (6-10 Years)** – The Dilemma: Industry vs. Inferiority
   The key undertakings of this stage are to learn skills, develop the capacity to self-evaluate, to partake in team games and to maintain friendships. Education is at the core of this stage. It is about learning what kinds of things represent strengths and assets and how to negotiate formal learning situations. A successful outcome will be the acquisition of specific skills, developing work competence and learning how to enjoy achievement.

5. **Adolescence (11-18 Years)** – The Dilemma: Identity vs. Role Confusion
   The main endeavours during this stage are developing sexual relationships, maturing emotionally, cognitively and physically and getting on with peers. It is about how one appears to others and to balance this with internal self-confidence. It is about developing an understanding of how words, actions and roles create meaning in the eyes of others. Career issues are to the fore during this stage as are the bigger questions such as what is the meaning of my life.

6. **Early Adulthood (18-34 years)** – The Dilemma: Intimacy vs. Isolation
   The main projects during this stage are the establishment of a stable and intimate relationship with another, becoming economically independent and embarking on the task of caring. This stage challenges the learner to prioritise the other over ego projects.

7. **Middle Adulthood (35-60 Years)** – The Dilemma: Generativity vs. Stagnation
   The challenge in this stage of development is to be able to juggle the maintenance of close relationships with managing a career, taking care of a household, parenting and giving back to the community. It is about investing in the next generation. Involvement in socially valued work and philanthropic activities is common during this stage. It is not about the ability to have, or to want, but wanting to invest something in the community and the next generation.

8. **Later Adulthood (60 years-Death)** – The Dilemma: Ego integrity vs. despair
   This stage is about redirecting ones efforts, retaining one's rationality and coming to terms with death. In some ways it is too late at this stage to retrieve the past. It is about a sense of fulfilment about one's life and a feeling of mutuality between self and others. The apex of achievement is the capacity to be actively concerned with life in the face of death but with a love of life. The resolution of this dilemma is very difficult not least because it is one's past life that forms the basis of judgment. This can result in despair and fear of the loss of self-sufficiency, loved ones and death.

Erikson's stages have become widely utilised both from a therapeutic perspective in helping people resolve issues that arise from previous life experiences and in developing age appropriate learning and development materials. It is probably fair to say his early stages have been more influential than his later stages. Nevertheless these provide some useful background information for educators working with more mature learners. They are particularly useful in providing practical solutions and providing a means to design and evaluate teaching practices from an emotional as well as a cognitive perspective.

Another useful way to view lifespan development was proposed by Paul Baltes (1987). He characterised human development on the basis of seven contentions that can incorporate most aspects of the process and which have proved particularly useful to educators of more mature learners. One of the most important aspects of Baltes' approach is that it is optimistic in that inherent within the contentions is the view that development and learning can occur right across the span of a person's life. The 'old dog – new tricks' cliché does not apply.

Baltes' Model of Human development

1. Life long in that no one period predominates in importance.

2. Multi-dimensional in that it consists of the interaction of biological, social and cognitive dimensions and even within one dimension, e.g. learning, there are many components including motor learning, problem solving and social learning etc.

3. Multi-directional in that some dimensions of development may increase while others decrease. For example, while an older person's speed of information processing is slower, his/her world knowledge provides a firmer basis of r decision making.

4. Plastic in that it is susceptible to being enhanced or inhibited by life conditions.

5. Historically embedded in that it is influenced by economic, social and personal history. For example, those who have grown up with Information Technologies view it in a very different way than those who have come to it later in life.

6. Multi-disciplinary in that many different professions share an interest in it and view it in different terms. From the perspective of the educator one key aspect of development is the way in which it influences a person's approach to learning.

7. Contextual in that it occurs within a wide range of contexts delineated by the personal characteristics of the learner, his/her physical, social, cultural and economic environments and historical events of his/her time e.g. war, famine, economic depression etc.

In conclusion, adolescent and adult learning, needs to be approached from a broad perspective in which the personal characteristics of the individual (e.g. age, health, appearance etc.), and the developmental changes that occur in these over the life-course, are understood to unfold within a number of external systems that can include the individual's carers, acquaintances, institutions, traditions and rituals.

Lifelong Learning

The term 'lifelong learning' has become pervasive in the language and discourse of politicians, funding agencies and training and development specialists over the last fifteen years. There are innovative programmes and research streams that are specifically focused on lifelong learning. Adult learning is related to, but distinct from, adult education and thus it is important to explore the distinctions. One possible way to discriminate between the two is to view adult learning as relating to the internal, cognitive processes and transformations that occur within the person whereas the term adult education delineates the more formal aspects of learning such as the external contexts or methods.

While the concept of education as a concern even in adult life has been around for over 100 years, it is only recently that is has been seen as a permanent aspect of citizenship. The basic tenets underlying a lifelong perspective on education emphasise the importance of experiential learning, the need to cut across the limitations of traditional subject-based categories of knowledge and skills, the importance of recognising a person's prior experience and learning and the importance of a 'whole life' perspective on learning rather than a narrow vocational view. This is a very different view on adult learning than that proposed within current formal systems of competency based approaches to initial and continuing professional development and accreditation. Nevertheless there must be room for both approaches within the sphere of lifelong learning. The formal structures for second chance education and the accreditation of prior learning and experience are essential elements of the lifelong educations system, but it is also essential to recognise informal education and the acquisition of transferable skills, 'soft' skills and the capacity to reflect on our own habits of perceiving, thinking and acting as being at the core of adult learning.

Lifelong learning and the Learning Society are two inter-related concepts, introduced in the 1970s. Learning involves all of life in terms of both the lifespan and the wide variety of spheres in which it occurs and consequently even formal approaches to education must expand beyond the view that a person can be provided with all he/she needs to know to handle life prior to becoming an adult. This

forms the basis for the development of a Learning Society where learning is not merely facilitated for adults but expected of them as part of their role as citizens (Faure et al. 1972).

The speed at which the Information or Knowledge Society has evolved has made arguments about the relative importance of lifelong learning redundant. There is general acceptance that the pace of change particularly in the in field of technology makes it essential for adults to update their skills and change the ways they work in the world on an on-going basis. This has resulted in an imperative upon many adults to engage in post-school organised learning and in the growth in 'mentoring' even for top executives. The explosion of short courses and popular self-improvement manuals and courses is evidence that these changes have occurred far beyond the confines of the universe of technology. Nevertheless, the economic and social impacts of older adults with redundant occupational skills on the competitiveness of regions within the global economy have fuelled substantial investment in continuing professional development and adult learning. Changes in the way work is organised and the materials and equipment required to carry out productive activities have increased demand for workers with more flexible and transferable skills and who are capable of showing appropriate initiative in decision making and problem solving. In parallel with this growth in demand for flexible learners there is a shift away from formal classroom approaches to providing education to more distributed approaches that blend the use of face to face approaches with web-based and distance learning. One of the major risks in this process is the extent to which the individualisation of learning creates a greater dependence upon the individual to identify his/her own learning needs and source the appropriate educational response. It is this individualisation that represents the greatest distinguishing characteristics between lifelong learning and adult education. Where the former is viewed as crucial for societies who need to ensure an active and productive population across the lifespan, the latter is more about the empowerment of learners to take control of the means of education and to assert their right to participation in a democratic society. This key distinction has the greatest impact on the role of the educator in the process.

The issue for educators working with older learners is not whether one approach is more suitable than the other but rather the need to match the learning environment to the type of learning that is required in a particular context. One of the central aspects of lifelong learning is the need to foster from an early age the habits of self-directed learning. A good educator matches the learner's current capacity for self-direction to both the aspect of life to be learnt and the person's lifespan developmental life challenges. A 'good' teaching approach is not so much its pedagogical basis but the way in which it assists a learner to advance towards greater independence as a learner and greater ownership of the learning project. Most teaching styles are 'good' when appropriately applied in the right context and many learning difficulties arise from the mismatch between educator's style and the learner's priorities and needs.

2. Models of Learning and Development

From the Horse's Mouth...

I want to talk about learning. But not the lifeless, sterile, futile, quickly forgotten stuff that is crammed in to the mind of the poor helpless individual tied into his seat by ironclad bonds of conformity! I am talking about LEARNING - the insatiable curiosity that drives the adolescent boy to absorb everything he can see or hear or read about gasoline engines in order to improve the efficiency and speed of his 'cruiser'. I am talking about the student who says, "I am discovering, drawing in from the outside, and making that which is drawn in a real part of me." I am talking about any learning in which the experience of the learner progresses along this line:

"No, no, that's not what I want"; "Wait! This is closer to what I am interested in, what I need"; "Ah, here it is! Now I'm grasping and comprehending what I need and what I want to know!"

- Carl Rogers 1983

What's my motivation?

Many theories of learning and development have become part of the way we speak about the world and some of the theorists are well known even to those who are not directly involved in the field of education. This section presents a number of these in order to highlight some important underpinning concepts that are essential in the context of diversity in education across the lifespan.

There are many different theories of how people learn. What follows is a selection of the most relevant. The key perspective to take from each one is to consider their relevance to how more mature learners learn and implications for the way education should be structured for them. It is also possible to relate the models to your own particular habits of learning and to recognise that not everyone learns the way you do. In a recent search of the web over fifty theories of learning were found. This section only deals with a few. The criteria for selection was that they were useful to those involved with more mature learners and in different arenas of informal education.

It is essential that educators move away from traditional approaches in which it is taken as a given that if you get the lesson structure right, learning (as measured by tests and assessment) will follow. This approach, which pays little attention to the nature of learning, inevitably leads to an impoverishment of education for learners of all ages.

In this section a number of theories of learning, and how they relate to lifelong learning and differentiated education are presented, including, Behaviourism, Cognitivism, Constructivism, Social Constructivism, Multiple Intelligences, Metacognition, Motivation and Learning.

2.1 Behaviourism

Behaviourism was the predominant school of thought in educational psychology from the 1930s until the mid 1970s. It is often simply referred to as 'Learning Theory'. It defines learning as the changes that take place in the observable behaviour of a learner in terms of stimulus-response processes. Behaviourists were not interested in internal mental states, but concentrated their attention on what was observable and therefore external. This theory is relatively simple to understand because it relies only on observable behaviour and describes several universal laws of behaviour. Its positive and negative reinforcement techniques can be sometimes effective.

Behaviourists argued that only explicit behaviour is suitable for scientific investigation and they investigate learning in terms of *Stimulus-Response (S-R)* processes. Learning, therefore, is the acquisition of new behaviour and it's explained without referring to mental processes which are deemed not to be observable. Burrhus Frederic Skinner is one of the best known exponents of Behaviourism. He elaborated the *Operant Conditioning* theory which is founded on Classical Conditioning and on the work of theorists such as Pavlov, Watson and Thorndike. Operant Conditioning is based on the principle of the learner being an active participant who, when operating on the environment and being rewarded, achieves a given behaviour. Applying reinforcements, Skinner formulated the following basic behavioural rules:

- → Behaviour that is followed by positive environmental effects (Positive Reinforcement or Reward) increases in frequency.
- → Behaviour that is followed by the withdrawal of negative environmental effects (Negative Reinforcement) increases in frequency.
- → Behaviour that is followed by negative environmental effects (Punishment) decreases in frequency.

→ When behaviour that was previously increased in frequency through reinforcement is no longer reinforced but rather decreases in frequency (Extinction).

The above behavioural rules demonstrate that reinforcement plays a major role in obtaining a desired response from the learner. Once the behaviour is established, it is maintained through the concept of shaping and reinforcement schedules. Shaping is the method used to guide the learner to accomplish a given behaviour. It implies using positive reinforcement or rewarding the learner when exercising the correct behaviour. Continuous reinforcement, rewarding every correct action, will make a behaviour increase rapidly but it is unlikely to maintain it over time. On the other hand, Intermittent Reinforcement (based on intervals or occurrences of correct actions) is more likely to obtain behaviour that increases in frequency more slowly but is longer lasting.

The relevance of behaviourism to educators of more mature learners lies in its application in changing frequently engrained and yet unhelpful habits of thinking and acting. For example at the heart of many self-help approaches and quit smoking programmes can be discerned the principles of learning theory. It is most often seen in the application of cognitive behavioural approaches to behaviour change where thinking and internal language become the focus for change. Negative habits of thinking and internal language often interfere with the capacity of a learner to take on new task and challenges. Cognitive behavioural techniques have been demonstrated to be quite effective in changing a person's learning self-concept and enhancing a more optimistic approach to new knowledge.

2.2 Cognitivism

During the 50s, 60s and 70s, many psychologists became dissatisfied with the behaviourist approach due to its failure to incorporate mental events in the study of learning. Cognitivism was one response to the behaviourist perspective. It viewed knowledge acquisition as a symbolic, mental construction in the mind of individuals and as the outcome of learning. Thus, they see learners understanding new relations among the parts of a problem by acquiring and reorganising information into understandable cognitive structures or 'schema'.

From a cognitivist perspective, the learner is viewed as an active participant in the knowledge acquisition process. Therefore, instructional material that utilises demonstrations, illustrative examples and corrective feedback are helpful in providing mental models that the learner can follow. When new information can be stored in an organised, meaningful manner, learning has resulted. As long as the learner has the ability to organise, categorise and retrieve information - whether it be through cues, organisers, analogies - learning can be said to be accomplished. The following types of learning are best explained by cognitivism - reasoning, problem solving, information processing and other complex forms of learning and any process which requires the application of rules. Rules involve actions, if you run through the steps often enough, with positive feedback for encouragement, the procedure will be integrated into a single, smooth action. This theory is very relevant to instructional design since the use of feedback to guide and support the learner to create accurate mental connections is a key component in the cognitive theory. Any instructional materials should be structured based on the learner's existing mental structures. There is a reality that is socially imposed and universally agreed and which the instructional designer must be able to assume exists for the learner. That way, the designer can use simulation to reflect real life situations.

Jerome Bruner's work is very significant and one implication of his developmental theories is that learners should be provided with study materials, activities and tools that are matched to and capitalise on their developing cognitive capabilities. For example, an educator wanting to help children learn about dinosaurs could use all three modes. Students could be asked to construct models of dinosaurs (enactive); they might watch a film about, or involving, dinosaurs (iconic); or they could consult reference texts and then discuss their findings (symbolic). In the 1960s Jerome

Who's Who: Jerome Bruner

Jerome S. Bruner (1915-) is one of the best known and influential psychologists of the twentieth century. He was one of the key figures in the so called 'cognitive revolution' - but it is in the field of education that his influence has been especially felt. Piaget and Bruner demonstrated how thought processes could be subdivided into three distinct modes of reasoning. While Piaget related each mode to a specific period of childhood development, Bruner saw each mode as dominant during each developmental phase, but present and accessible throughout. Bruner's model of human development as a combination of enactive skills (manipulating objects, spatial awareness), iconic skills (visual recognition, the ability to compare and contrast) and symbolic skills (abstract reasoning) has influenced psychological and educational thought over the past 50 years. According to Bruner, developmental growth involves mastering each of the increasingly more complex modes - enactive to iconic to symbolic. Mastering this incorporates becoming more skilled in translating between each mode. An example of this sort of translation could be a discussion (symbolic mode) of what students had learned from an experiment (iconic mode).

From the Horse's Mouth...

To instruct someone... is not a matter of getting him to commit results to mind. Rather, it is to teach him to participate in the process that makes possible the establishment of knowledge. We teach a subject not to produce little living libraries on that subject, but rather to get a student to think mathematically for himself, to consider matters as an historian does, to take part in the process of knowledge-getting. Knowing is a process not a product.
- Jerome S. Bruner, 1966

It is surely the case that schooling is only one small part of how a culture inducts the young into its canonical ways. Indeed, schooling may even be at odds with a culture's other ways of inducting the young into the requirements of communal living... What has become increasingly clear... is that education is not just about conventional school matters like curriculum or standards or testing. What we resolve to do in school only makes sense when considered in the broader context of what the society intends to accomplish through its educational investment in the young. How one conceives of education, we have finally come to recognise, is a function of how one conceives of culture and its aims, professed and otherwise.
- Jerome S. Bruner, 1996

Bruner developed a theory of cognitive growth. His approach (in contrast to Piaget) looked to environmental and experiential factors. Bruner suggested that intellectual ability developed in stages through step-by-step changes in how the mind is used. Bruner's thinking became increasingly influenced by writers like Lev Vygotsky (see below) and he began to be critical of the intrapersonal focus he had taken, and the lack of attention paid to social and political context.

Four key themes emerge from Bruner's book, "*The Process of Education*" (1960)

→ **The role of structure in learning and how it may be made central in teaching**: The approach taken should be a practical one. 'The teaching and learning of structure, rather than simply the mastery of facts and techniques, is at the centre of the classic problem of transfer. If earlier learning is to render later learning easier, it must do so by providing a general picture in terms of which the relations between things encountered earlier and later are made as clear as possible'.

→ **Readiness for learning**: Here the argument is that formal education has wasted a great deal of people's time by postponing the teaching of important areas because they are deemed 'too difficult'. We begin with the hypothesis that any subject can be taught effectively in some intellectually honest form to any child at any stage of development. This notion underpins the idea of the spiral curriculum - 'A curriculum as it develops should revisit these basic ideas repeatedly, building upon them until the student has grasped the full formal apparatus that goes with them'.

→ **Intuitive and analytical thinking**: Intuition, the intellectual technique of arriving at plausible but tentative formulations without going through the analytical steps by which such formulations would be found to be valid or invalid conclusions is a much neglected but essential feature of productive thinking. Here Bruner notes how experts in different fields appear 'to leap intuitively into a decision or to a solution to a problem'.

→ **Motives for learning**: Jerome Bruner believed that ideally it is an interest in the material to be learned that is the best stimulus to learning, rather than external pressure of grades or exams. In an age of increasing spectatorship, motives for learning must be kept from going passive and should be based as much as possible upon the arousal of interest in what there is be learned, and should be kept broad and diverse in expression.

Cognitivism has a particular application to learners who are faced with the task of acquiring knowledge and skills in unfamiliar fields. It's basis in rationality and the control of processes is particular suited to mature learners. Confronting new domains of learning requires a systematic rule based approach which characterises the knowledge to be acquired in a set of rule based processes. For example, a mature learner who embarks upon learning to play golf will initially formulate the skills required as a series of processes to be followed e.g. keep your eye on the ball, back straight, elbow bent etc. The challenge for the mature learner is to go beyond the control of these processes to a point where they become part of a smooth continuous and replicable procedure. Clearly cognitive strategies are most useful when the theme or topic is more abstract and has less of a skill component. The advantage of cognitive strategies is that they are more easily accessed by the learner and thus adjusted to new circumstances. However, a major disadvantage is that cognitive approaches to performance are by their nature much slower and prone to disruption by stress and tiredness.

2.3 Constructivism

The shift in emphasis from teacher-centred to learner-centred education is further developed in the work of the ***Constructivists***. Constructivism, the predominant school of thought in learning theory since the 90's, is an approach to teaching and learning based on the premise that cognition (learning) is the result of mental construction.

Constructivism views learning as a process in which the learner actively constructs new ideas or concepts based on his current and past experiences. Learning therefore is a personal endeavour. Knowledge is not received from outside but rather constructed or interpreted by the learner when this engages on reflecting on his/her own experiences, perceptions, mental structures and beliefs. Knowledge is a personal construct and hence not absolute. The proposition contemplates that we all share broad common realities/concepts and by individually and internally elaborating on them we construct our own knowledge.

Constructivists place a strong emphasis on the learner rather than the teacher. It is the learner who interacts with objects and events and thereby gains an understanding of the features held by such objects or events. The learners individually discover and transform complex information constructing their own conceptualisations and solutions to problems. In constructivist thinking, learning is also affected by the context and the beliefs and attitudes of the learner. According to Bruner and other constructivists, the role of the teacher is now one of facilitator who helps the students to discover principles for themselves by working on real world problems, on their own or in collaboration with their peers. The writings of Piaget, Vygotsky, along with the work of John Dewey, Jerome Bruner and Ulrick Neisser are considered to form the basis of the constructivist theory of learning and instruction.

Constructivism has particular relevance in learning tasks where it is important for the learner to find new ways of dealing with old problems. For example, in a situation where a learner experiences anxiety when faced with a particular situation or task, being able to identify how he/she creates a negative anticipation of the event prior to engagement can help him/her in reconstructing the event in such a way as to approach it in a more positive way.

2.4 Social Constructivism

This approach to learning is well elaborated by the ***Social Constructivists*** who place a strong emphasis on the role of social-cultural context and in particular interpersonal interactions in the development of cognition. In social constructivist terms, knowledge has a social nature and it is the result of social interaction and the use of language. Social constructivists recognise the context in which learning takes place and the social context that the learner brings to the learning environments as paramount in facilitating meaning construction. One of the main exponents of Social Constructivist theory was Lev Vygotsky who perceived human development in a broad social context. He asserted that individual mental processes stem from social processes. Furthermore, he highlighted language as a paramount tool in social development since it allows the learner to detach herself from the limitations of the immediate environment in which he or she is immersed.

The Social Constructivist learning model asserts that culture is the prime determinant of individual development. Humans are the only species to have created culture, and every human child develops in the context of a culture. Therefore, learning and development are affected by culture, including the culture of family environment and educational environment. Culture makes two sorts of contributions to a child's intellectual development. First, through culture children acquire much of the content of their thinking, that is, their knowledge. Second, the surrounding culture provides a child with the processes or means of their thinking, what Vygotskians call the tools of intellectual adaptation. In short, according to the social cognition learning model, culture teaches children both what to think and how to think.

- → Cognitive development results from a dialectical process whereby a child learns through problem-solving experiences shared with someone else, usually a parent or teacher but sometimes a sibling or peer.

- → Initially, the person interacting with the child assumes most of the responsibility for guiding the problem solving, but gradually this responsibility transfers to the child.

- → Language is a primary form of interaction through which adults transmit to the child the rich body of knowledge that exists in the culture.

- → As learning progresses, the child's own language comes to serve as his/her primary tool of intellectual adaptation. Eventually, children can use internal language to direct their own behaviour.

- → Internalisation refers to the process of learning - and thereby internalising - a rich body of knowledge and tools of thought that first exist outside the child. This happens primarily through language.

- → A difference exists between what a child can do on his/her own and what the child can do with help. Vygotskians call this difference the Zone of Proximal Development.

- → Since much of what a child learns comes form the culture around him/her and much of the child's problem solving is mediated through an adult's help, it is wrong to focus on a child in isolation. Such focus does not reveal the processes by which children acquire new skills.

- → Interactions with surrounding culture and social agents, such as parents and more competent peers, contribute significantly to a child's intellectual development.

Since many people learn best through interaction, educators should design learning environments to emphasise interaction between the person and the learning tasks. Even at a relatively early age learners, with appropriate assistance, can often perform tasks that would at first glance appear to be beyond their developmental level. Regardless of age people learn best when they are actively involved in a process. This means creating learning challenges that are age appropriate but also have significant relevance to something the learner wants to achieve. This is easier to do for younger learners. It is an issue of particular importance in adult education and adult literacy. Good education must derive from an understanding of the mental models that learners use to perceive the world and the assumptions they make to support those models.

Social Constructivism promotes the customisation of learning tasks to the students' prior knowledge, current life circumstances and aspirations for the future. Also, it emphasises hands-on problem solving and contends that the purpose of learning is for an individual to construct his or her own meaning, not just memorise the "right" answers and regurgitate someone else's meaning. Its importance in education for more mature learners must not be underestimated. Firstly it provides a useful explanation for the way in which learners acquire not only knowledge, skills and attitudes but also a self-concept of themselves as learners. It is often this that stands in the way of the acquisition of unfamiliar information and knowledge. Secondly, it places the learner in the 'driving seat' when it comes to approaching learning and thus is particularly useful to older learners. Thirdly, it has relevance not only to the acquisition of knowledge and skills but also socio-emotional learning and thus can contribute to assisting learners to make the transition from one life stage to another through self-directed learning activities. Finally, with its emphasis on the role of language and in particular conversation in the construction of meaning it opens up a range of more informal approaches to educator in designing learning environments.

2.5 Metacognition

Metacognition is one of the latest theories in educational psychology, in fact we engage in metacognitive activities everyday. Metacognition enables us to be successful learners, and has been associated with intelligence (e.g., Borkowski, Carr, & Pressley, 1987; Sternberg, 1984, 1986a, 1986b). It refers to higher order thinking which involves active control over the cognitive processes engaged in learning. Activities such as planning how to approach a given learning task, monitoring comprehension, and evaluating progress toward the completion of a task are metacognitive in nature. Because metacognition plays a critical role in successful learning, it is important to study metacognitive activity and development to determine how students can be taught to better apply their cognitive resources through metacognitive control.

Metacognition is often simply defined as "thinking about thinking" and it is a term most often associated with John Flavell. The DfES Thinking Skills Glossary helpfully defines metacognition as, "The process of planning, assessing, and monitoring one's own thinking" and "thinking about thinking in order to develop understanding or self-regulation". Flavell's argued that metacognition refers to both the knowledge that a learner has about how she or he learns best, and the regulation of one's own learning experiences. Metacognitive knowledge can refer to learners' recognition of their general learning processes, their recognition of the demands of a particular task, as well as their recognition of which strategies are most appropriate during any given task. Metacognitive regulation, on the other hand, refers to being able to recognise when one has successfully completed a task, and, crucially, how it was completed. But even Flavell acknowledges that distinguishing metacognition (thinking about thinking) from plain cognition (thinking) is not always straightforward. For example, what is the difference between cognition and metacognition when you know that you're not very good at learning physics? The distinction lies in how the learner uses the information he/she has about his/her own learning.

Metacognition often occurs when learners become aware that their cognition their ability to comprehend something has failed them, for example, not being able to understand some textual information or a mathematical formula, and that they have work to do to make sense of it. The metacognitive act, then, would be interpreted as the learner's realisation, firstly, that there are limitations on their knowledge to complete a task, and, secondly, that they possess strategies for rectifying that situation. In the words of Guy Claxton, whose Building Learning Power program is now popular with many teachers, metacognition is about "*knowing what to do when you don't know what to do*".

At least part of the confusion surrounding metacognition, and particularly in how you foster it, however, is that it is often couched in terms of 'higher order thinking' and 'self-regulated learning' - terms which, at least superficially, sound more suited to older learners with a well-developed cognitive repertoire than to young children whose cognition itself is still developing rapidly. According to Claxton, though, it is quite possible for very young children to develop metacognitive skills. He provides an example of a 9 year-old child with a passion for adventure stories who is able not just to describe what she reads, but how she reads too. This is what Claxton describes as a sort of conscious reflection on one's learning processes - a process of deliberately reflecting on what it is one has achieved, and on thinking about what to do next.

One of the reasons for seeing metacognition as increasingly important nearly 30 years after it was first coined in education is because we're just now approaching implementation of the new agenda of personalisation. The personalised approach to education, at its best, will see learners actively involved in planning and managing their own learning goals. The ability to reflect on what and how one has learned, and then to implement plans for self-development, will be critical to learners' personal success. Teachers need to be able to promote the young people in their care to

From the Horse's Mouth...

If we are serious about developing learners who are internally driven to want to learn, and whose intention in learning is to make meaning and develop their understanding, then we must encourage them to exert control over their own learning. The process of reflecting on and controlling our own learning is called metacognition.
- Peter Kelly, 2005

From the Horse's Mouth...

Too often, motivation is seen as a characteristic of pupils, perhaps not quite as unchanging as age or eye colour, but nevertheless firmly embedded in their make-up. We have argued that it can be seen as the product of an interaction between pupils and the varying situations in which they find themselves at school.
- Galloway et al., 1998

become more reflective and self-evaluative, and to be able to recognise that when learning gets tough, they have strategies for tackling it.

Metacognitive skills and knowledge are developmentally sensitive and thus represent an asset for older learners. This is not to underestimate the capacity of young children to reflect upon their own language and skills but simply that for more mature learners metacognitive strategies form a readily available approach to learning. They are better able to monitor the level of their own knowledge and are acutely aware of their learning strengths and weaknesses. If anything the educator working with older learners needs to assist them to break free from their prejudgments about what they will and will not be able to do and to assist them to experiment with new ways of learning.

Educators should assist older learners to apply the metacognitive strategies they already possess with greater confidence and provide them with techniques and methods to become more effective self-managing learners.

2.6 Motivation and Learning

Many experts suggest that children are born with intrinsic motivation, a natural desire to learn and make sense of the world (Westwood 2004). However Westwood goes on to cite many studies which would appear to indicate that although all children enter school with enthusiasm to learn and the expectation of success, some experience failure, lose motivation and for this reason he believes that it is vital for teachers to understand how children learn, understanding how will help teachers to choose appropriate methods of teaching and appropriate materials for the different characteristics of learners.

Motivation plays a central role in human learning. According to Driscoll (2000) teachers believe that this lack of motivation is the primary cause for students avoiding class work, failing to engage and losing the desire to learn. Westwood outlines two main categories, extrinsic and intrinsic motivation:

→ Extrinsic motivation is considered when the learner tries hard to learn in order to gain some reward or avoid negative consequences. "Both forms of motivation are extremely important".

→ Intrinsic motivation is where learners willingly involve in their learning, "intrinsic motivation is almost entirely absent in students with a history of learning difficulty in school" (Westwood 2004).

Motivation in formal educational settings

Westwood cites the following principles, taken from studies, as maximising learners' motivation in the formal educational settings:

→ Learners do not experience frequent failure and harsh criticism

→ The curriculum material is interesting and relevant; topics are sufficiently challenging, but not overwhelming

→ Learners are encouraged to set their own goals and are then supported in achieving them

→ Learners are given the opportunity to make choices and exercise some control over what they do in class and the manner in which they do it (greater autonomy)

→ Collaborative group work is used frequently. Educators reverse learners' negative thinking about their own capabilities and enhance positive self-belief by encouraging open discussion about learning, learning strategies, effort and ability.

→ Educators remember to apply the principle that learners' motivation and confidence are enhanced by respect and approval from others

→ If a reward system is used in a formal educational setting, it should ensure that all learners attain rewards if they put in sufficient effort.

(Taken from "*Learning and Learning Difficulties: A Handbook for Teachers*", by Peter Westwood)

3. Extension from Thinking to Learning

Who's Who: John Dewey

John Dewey (1859 - 1952) is considered as one of the leading exponents in the development of educational thinking in the twentieth century. Dewey's philosophical pragmatism, concern with interaction, reflection and experience, and interest in community and democracy, were brought together to form a highly suggestive educative form. In the 1920's / 1930's, John Dewey became famous for pointing out that the authoritarian, strict, pre-ordained knowledge approach of modern traditional education was too concerned with delivering knowledge, and not enough with understanding learners' actual experiences.

What's my motivation?

In this section we will see why critical thinking skills should be incorporated into every learners' experiences, regardless of his/her age, how this can be of benefit not only in formal educational settings but throughout a person's their entire life.

"Thinking about thinking" has to be a principal ingredient of any empowering practice of education (Bruner 1996). This means understanding the deeper meaning of problems, keeping an open mind about different approaches and perspectives and thinking reflectively rather than accepting and carrying out instruction without understanding and evaluation. To think critically or to learn how to solve any problem or learn any new knowledge, learners need to take an active role in learning. Enabling learners to have an awareness of themselves as thinkers is a key element of modern pedagogy (Cook & Ralston 2005).

Currently, a number of psychologists and educators are studying learners' critical thinking skills and although definitions vary they all have in common the notion that critical thinking involves grasping the deeper meaning of problems, keeping an open mind about different approaches and perspectives and thinking reflectively rather than accepting statements. Critical thinking is a form of reflective reasoning that analyses and evaluates information and arguments by applying a range of intellectual skills in order to reach clear, logical and coherent judgements within a given context. Helping learners to consciously to develop those skills and to use the language and concepts of the subject empowers their learning. Learners must understand the language of reasoning and use different patterns of reasoning, as well as different standards for evaluating arguments. How we cultivate the ability to think critically, according to Robert J Sternberg, a leading cognitive psychologist is to teach learners to use the right thinking process to develop problem-solving strategies, to expand their knowledge base and to become motivated to use their newly learned thinking skills and to this or solve any problem learners need to take an active role in learning. They need to call on a variety of active thinking process and learn to see things form multiple points of view. Thinking does not occur in the absence of knowledge, they need information but they also need to be able to reflect, evaluate and apply it.

John Dewey worked with the concept of "reflective thinking and non-reflective thinking in the use of formulas or rules to achieve goals. Like Vygotsky, he viewed the mind and its formation as communal process. Thus the individual is only a meaningful concept when regarded as an inextricable part of his or her society, and the society has no meaning apart from its realisation in the lives of its individual members.

John Dewey emphasised practical ideas in both his philosophical and educational theories, always striving to show how abstract concepts could work in everyday life. He emphasised hands-on learning, and opposed authoritarian methods in teaching. Dewey argued that an educator must take into account the unique differences between each learner. Each person is different genetically and in terms of past experiences.

Even when a standard curriculum is presented using established pedagogical methods, each learner will have a different quality of experience. Thus, teaching and curriculum must be designed in ways that allow for such individual differences. For Dewey, education should also be for a broader social purpose, to help people become more effective members of democratic society. Dewey argued that the one-way delivery style of authoritarian schooling does not provide a good model for life in

democratic society. Instead, more mature learners need educational experiences which relate to them as valued, equal, and responsible members of society.

3.1 Thinking skills

One of key factors in the change in dialogue in formal educational settings is the impact of teaching thinking skills on educators' questioning. Educators tend to ask more questions when using a thinking skills approach and a higher proportion of the questions used are open ended (Wilks & Emery, 1997; Donnelly et al., 1999; Koufetta-Menicou & Scaife, 2000; McGregor & Gunter, 2001). Studies frequently report impact on questioning as one of the first tangible changes in practice and one that occurs early in the use of a thinking-skills approach. Asking more open-ended questions was also linked to increasingly focused questions (Ferretti et al., 2001), allowing more time for learners to think before answering and encouraging them to extend and develop responses. Educators also facilitated more questioning by the learners (Naisbett, 1997).

This change in practice reflects the shift in focus to an emphasis on exploring the processes of learning and developing underlying concepts which requires the educator to act as facilitator rather than instructor. Educators working on infusing thinking skills into learning content often refer to a sense of professional autonomy as they take control of education and learning in a formal setting (Baumfield et al., 2002).

While the evidence from the studies reviewed were mainly taken from research into teachers working with younger learners, the findings suggest that using a thinking skills approach can have a significant effect on educator behaviour at all developmental stages in a relatively short space of time. This approach to learning and development can stimulate educator inquiry offers a fruitful means of stimulating and supporting educators' professional development.

3.2 Edward De Bono and Lateral Thinking

Edward de Bono has written extensively about the process of lateral thinking -- the generation of novel solutions to problems. The point of lateral thinking is that many problems require a different perspective to solve successfully. De Bono identifies four critical factors associated with lateral thinking:

→ recognise dominant ideas that polarise perception of a problem,

→ searching for different ways of looking at things,

→ relaxation of rigid control of thinking,

→ the use of chance to encourage other ideas. This last factor has to do with the fact that lateral thinking involves low-probability ideas which are unlikely to occur in the normal course of events.

Although De Bono does not acknowledge any theoretical antecedents for lateral thinking, it seems closely related to the Gestalt theory of Wertheimer which emphasised higher-order cognitive processes in the midst of behaviourism. The focus of Gestalt theory was the idea of "grouping", i.e. characteristics of stimuli cause us to structure or interpret a visual field or problem in a certain way. His work is also highly relevant to the concept of creativity. De Bono presents his theories through two formats, the CoRT techniques and the 6 Thinking Hats.

From the Horse's Mouth...

We all acknowledge, in words at least, that ability to think is highly important; it is regarded as the distinguishing power that marks man from the lower animals. But since our ordinary notions of how and why thinking is important are vague, it is worth while to state explicitly the values possessed by reflective thought. In the first place, it emancipates us from merely impulsive and merely routine activity. Put in positive terms, thinking enables us to direct our activities with foresight and to plan according to ends-in-view, or to come into command of what is now distant and lacking. By putting the consequences of different ways and lines of action before the mind, it enables us to know what we are about when we act. It converts action that is merely appetitive, blind and impulsive into intelligent action.

- John Dewey on Education

The CoRT Techniques

The CoRT programme was designed by Edward de Bono and was first published in 1973. The name CoRT comes from the Cognitive Research Trust which de Bono established at Cambridge, England. CoRT consists of sixty lessons divided into six sections of ten lessons each, CoRT I to CoRT VI. The programme offers instructions in a selection of specific thinking skills. It is recommended that CoRT lessons are taught with a mixture of direct instruction by an educator, learner group work, plenary discussion, individual work and take home projects. The seven lessons used in this project from CoRT I consist of the following techniques: PMI (Plus, Minus, Interesting), AGO (Aims, Goals & Objectives), CAF (Consider all Factors), FIP (First Important Priorities), APC (Alternatives, Possibilities & Choices), OPV (Other Peoples Views) and C&S (Consequence & Sequels).

The Six Thinking Hats Technique

Another tool developed by de Bono is called the "Six Thinking Hats" technique, based on the idea that thinking is a skill which can be taught. This is a tool which can be used in a range of situations as a framework for thinking, and in particular for communication tasks such as the structuring of meetings, to help focus on the thinking process.

Traditionally, for many people, one's own argumentation is a key tool for communication and discussion, however with the 6-Hats technique people are taught to think in parallel, rather than interaction by opposition. This approach allows individuals to go beyond their own (and other people's) first reaction and instead look at different perspectives in order to make better decisions. When using the 6-Hats technique in a meeting situation people spend different phases of the meeting in different modes of parallel thinking, notionally wearing different hats. Each of the six hats represents a unique way of dealing with an issue, or communication style, the hats are distinguished by colour as follows;

White Hat (Logical)

- Separates fact from speculation
- Specifies action needed to fill gaps
- Assesses the relevance and accuracy of information

Blue Hat (Facilitator)

- The role of the facilitator
- Focuses and refocuses thinking
- Makes calls for the group to make decisions

Red Hat (Emotional)

- Gives permission to express feelings, hunches and intuitions
- Does not require justification
- Can be used to help make a decision

Yellow Hat (Positive)

- Explores the benefits of an idea
- Must give reasons why an idea is valuable or might work
- Reinforces creative ideas and new directions

Black Hat (Critical)

- Explores why an idea may not work
- Must give logical reasons for concerns
- Points out difficulties

Green Hat (Creative)

- Encourages a search for new ideas
- Seeks to modify and removes faults from existing ideas
- Makes time for creative effort

3.3 Multiple Intelligences

One of Bruner's students was Howard Gardner. Bruner's work, especially in The Process of Education (1960) was to have a profound impact on Gardner. Gardner has questioned the idea that intelligence is a single entity, that it results from a single factor, and that it can be measured simply via IQ tests. He has also challenged the cognitive development work of Piaget. Bringing forward evidence to show that at any one time a child may be at very different stages for example, in number development and spatial/visual maturation, Howard Gardner undermined the idea that knowledge at any one particular developmental stage hangs together in a structured whole. Over the past decade, Multiple Intelligence theory has been a popular basis for reform efforts within education. It validates the belief that students represent a diversity of cognitive strengths and ways of learning, and they use diverse practices in response. Multiple Intelligence theory is also popular because it is compatible with philosophies and approaches in place in many schools (for instance, whole language, cooperative learning and hands-on math).

This theory of human intelligence, developed by Gardner, suggests there are at least seven ways that people have of perceiving and understanding the world. Gardner labels each of these ways a distinct "intelligence", in other words, a set of skills allowing individuals to find and resolve genuine problems they face. Gardner defines an "intelligence" as a group of abilities that:

- Is somewhat autonomous from other human capacities
- Has a core set of information-processing operations
- Has a distinct history in the stages of development we each pass through
- Has plausible roots in evolutionary history

While Gardner suggests his list of intelligences may not be exhaustive, he identifies the following seven:

- Logical-Mathematical intelligence
- Musical intelligence
- Spatial Intelligence
- Bodily-Kinaesthetic intelligence
- Intrapersonal intelligence
- Interpersonal intelligence
- Verbal-Linguistic intelligence

Traditional schooling heavily favours the verbal-linguistic and logical-mathematical intelligences. Gardner suggests a more balanced curriculum that incorporates the arts, self-awareness, communication, and physical education. He also advocates instructional methods that appeal to all the intelligences, including role playing, musical performance, cooperative learning, reflection, visualisation, story telling, and so on and assessment methods that take into account the diversity of intelligences, as well as self-assessment tools that help students understand their intelligences.

3.4 Bloom's Taxonomy

In 1956, Benjamin Bloom headed a group of educational psychologists who developed a classification of levels of intellectual behaviour important in learning. Bloom found that over 95% of the test questions students encounter require them to think only at the lowest possible level... the recall of information. Asking students to think at higher levels, beyond simple recall, is an excellent way to stimulate students' thought processes. Different types of questions require us to use different kinds or levels of thinking. Bloom developed a classification of levels of intellectual behaviour in learning. This taxonomy contained three overlapping domains: the cognitive, psychomotor, and affective. Within the cognitive domain, he identified six levels: knowledge, comprehension,

From the Horse's Mouth...

I want my children to understand the world, but not just because the world is fascinating and the human mind is curious. I want them to understand it so that they will be positioned to make it a better place. Knowledge is not the same as morality, but we need to understand if we are to avoid past mistakes and move in productive directions. An important part of that understanding is knowing who we are and what we can do... Ultimately, we must synthesise our understandings for ourselves. The performance of understanding that try matters are the ones we carry out as human beings in an imperfect world which we can affect for good or for ill.
- Howard Gardner 1999

application, analysis, synthesis, and evaluation. These domains and levels are still useful today as you develop the critical thinking skills of your students. Bloom's six levels within the cognitive domain, range 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. Use these verbs in your lessons and discussion questions to ensure that students are thinking at higher levels. Verb examples are listed here:

Knowledge: arrange, define, duplicate, label, list, memorise, name, order, recognise, relate, recall, repeat, reproduce state.

Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognise, report, restate, review, select, translate.

Application: apply, choose, demonstrate, dramatise, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.

Analysis: analyse, appraise, calculate, categorise, compare, contrast, criticise, differentiate, discriminate, distinguish, examine, experiment, question, test.

Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organise, plan, prepare, propose, set up, write.

Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support, value, evaluate.

4. Inclusive Education and Universal Design for Education

What's my motivation?

A number of concepts have been introduced to describe an education system that is open to all. Two of these concepts, Inclusive Education and Universal Design in Education will be introduced in this section.

The concept of inclusion implies changes to curricula, teachers approaches and methods of assessment. Inclusive education practices emphasise active learning and differentiated instructional approaches. It is about recognising the diversity learning styles and needs in every group of learners and the individualisation of instruction. Currently inclusive education is an ideal to which systems, institutions and educators can aspire but there is a substantial distance to travel. Significant change is required to reach a point where the needs of both educators and learners are genuinely at the heart of education provision. But the concept provides a set of values which can inform policy development, a direction to guide curriculum design and a benchmark against which to chart progress.

In many respects the concept of inclusive systems reflects the principles of Universal Design which has developed and elaborated in other contexts. It is about educational environments that are open to all learners and in which all learners can participate. This requires the design of systems of provision, physical environments, curricula, teaching methods and procedures that can accommodate the wide diversity of learning needs as result of individual differences in the general student population. But it is also about providing safe and timely access to extra supports, interventions, equipment and adjustments to the environment to ensure inclusion into the life of the school in all respects.

A number of principles and values can be identified in the inclusive education approach. Firstly, the right to education on basis of equality of opportunity regardless of individual difference is central. Thus no one should be disadvantaged as a result of discrimination on grounds of race, colour, sex, language, religion, political or other opinion, national, ethnic or social origin, disability, birth, poverty or other status. Secondly, there is an assumption that all learners can benefit from mainstream education and the main issues is the responsiveness of the system and the degree of support available. This requires that systems adapt to the needs of the learner rather than expecting the individual having to adapt to the needs of the system. Thirdly, individual differences are regarded as a source diversity which adds to the educational experience of all learners. In this respect the views of all are valued and differences in speeds of learning and learning preferences are responded to through differentiate instruction and adapted assessment methods.

4.1 Benefits and Examples of Universal Design in Education

Universal design in education means providing information in a variety of formats because multi-sensory methods of receiving and expressing information can make curricula more accessible for students with and without disabilities. Further, universal design means delivering instruction using a variety of teaching methods. Technology provides the capacity to easily change information from one format to another. Materials, tools, and teaching practices developed with universal design concepts in mind can support student's learning by:

→ Building accessibility into design to ensure that features meeting the needs of the widest range of students are integrally incorporated into the curricula. Such designs can prevent the need for adaptations or retrofitting. For example, electronic curricular material that is designed to be compatible with assistive technology devices allows paraprofessionals, parents, or teachers to more easily program these devices with appropriate content.

→ Providing adaptable materials and media that allow students to choose and customise formats suited to their learning needs in a number of ways. For example, using digitised text, students can change text-to-speech, speech-to-text, font size, colours, and highlighting. Digitised materials can also support students through built-in scaffolding or cues to assist with activities such as word recognition, decoding, and problem solving and optional background knowledge for concepts that may not be familiar to some children (Pisha & Coyne, 2001).

→ Using Multiple Media such as video and audio formats provides a variety of ways to represent a concept and allows students to access the material through their different senses (Meyer & Rose, 2000). For example, computer-based simulations that include video description can help students with and without disabilities to visualise difficult concepts.

→ Providing challenging, salient, and age-appropriate materials to students with a range of abilities. For example, a student with dyslexia can utilise decoding supports and text-to-speech features incorporated into digitised history or science books, which enhances their ability to access this content. A recent study by CAST found that students who read novels in a digital format with decoding supports are more motivated to read because they can access the content at an age-appropriate level that is just challenging enough (O'Neill & Dalton, 2002). In addition, students and teachers can also use the Internet as a resource to find current and real-world examples of concepts that can make information more salient and grounded (Meyer & Rose. 2000).

→ Presenting information in multiple, parallel forms to accommodate diverse learning styles. For example, information can be presented orally in a lecture, visually through pictures, kinaesthetically by modelling it in a demonstration, and using technology-based programs that further allow students to interact with the concepts (McGlauglin, 1998).

Needless to say there is no absolute formula for universal design in education. It is an approach to designing and creating materials, processes, spaces, and practices that embrace the widest range of abilities and needs possible. More than that, it is a commitment to accessibility. By seeking out materials and approaches that have used a universal design approach, and by using universal design concepts in day-to-day practice, teachers will help more students access the knowledge and skills they need from the general education curriculum and beyond.

THE E4 PROJECT

EDUCATION FOR EMPLOYMENT

Section 2: Adults, Adolescents and Learning

Section 2. Adult, Adolescents and Learning

What's my motivation?

In module one, some of the differences between young learners and more mature learners were explored. In this module, many of these issues are dealt with in greater detail. The aim is to provide you with a strong theoretical basis to underpin the teaching and learning approaches that are presented in the rest of this handbook.

Adult learners differ from younger learners along a range of dimensions. Many of these are developmental and occur throughout the lifespan and not necessarily in a linear way. They can be age related or they can be related to when you were born e.g. baby boomers, the IT generation or they could be as the result of individual learning situations in your life. A number of these key distinctions can be described in general and apply to most young and older adults regardless of their background or personal experiences.

1. **Development**

   The developmental changes that occur as we grow older begin at a relatively early age for example, sensory development in terms of hearing and vision reach their peak before the age of 21. In the mid to late 20's perceptual processing and the speed of processing incoming information, begin to decrease. This impacts upon reaction times particularly in tasks where no prior learning is required. Along with these changes, adult learners find it more difficult to accommodate to information and knowledge with which they have little familiarity. Adults have to consciously apply problem solving strategies and techniques in ways that for example the adolescent learner, does not.

2. **World Knowledge**

   When it comes to understanding the world and having previous experience about a range of things, then the adult certainly has the advantage. It is interesting to watch the difference between someone who has come to a problem the first time, compared to an expert in that problem. For example, watching someone who has had substantial experience in doing a cryptic crossword is a revelation compared to the way in which most people would approach the same crossword. Young people are used to being novices when confronted with problems. In this regard they find it easier to adapt the way they work, and to accommodate incoming knowledge and information, even if it doesn't make any sense to them. On the other hand, adults are used to 'knowing' about things and find it difficult when they are stumped by a problem.

   Thus the nature of learning from a young learners perspective, is one of relying upon speeds of processing, perception, accommodation, and ready recall of skills and procedures. On the other hand, learning from an adult point of view is attempting to match what one already knows to what one needs to learn. In this regard, adults find it easier to learn certain types of material than others.

3. **Learning Behaviours and Strategies**

   Another important difference between young learners and older learners, is that older learners have had plenty of time, not simply to learn about the world, but also to 'learn how to learn'. Adult learners accumulate experience and knowledge about what kind of learning works best for what kind of tasks. When confronted with a problem, an adult will search his or her repertoire of problem solving strategies and choose the one that he or she senses is the right one on this occasion. A younger learner will probably take a more hands-on approach, and as a result will learn through doing, rather than through the application of a pre-determined strategy. Thus, adults tend to have a wider range of learning approaches at their disposal.

4. **Legacy**

The main drawback with being an experienced learner is the extent to which previous learning interferes with, or is compatible with, new learning. This can be referred to as the 'learning legacy'.

More mature learners come to the learning task with a previous life of learning experiences, some of which have been successful and some of which have been painful. The learning they have done has not only been in the frame of empirical knowledge but also of emotional knowledge and communicative knowledge. One of the most common problems encountered by adults in learning new material is when the learning legacy interferes with the acquisition of new knowledge. The learning legacy is very similar to the concept of assimilation.

Assimilation is an attempt to integrate new knowledge into existing knowledge. The learning legacy is broader than this. The learning legacy includes the fears and expectations of the learner, the types of learning strategies that the learner has become used to applying, and the degree to which the learners self-concept can cope with not being able to carry out a task or apply knowledge.

5. **Motivation and Imperatives**

Older learners also differ from younger learners in terms of what motivates them within the learning situation and what types of imperatives have brought them to the learning context. For younger learners between the ages of four to the end of mandatory formal education, the imperative which brings them to the learning context is in fact, the law. Apart from those who have difficulty with the approaches and content of formal education, the majority of younger learners are there because they have to be. As they grow older, other imperatives kick in, including a desire to achieve well in a career, to go to university and to focus on a successful transition to adulthood. Educators with younger learners apply a number of different strategies to motivate their learners to take a more active interest in a particular topic or subject. However, these are short term and immediate motivators such as running competitions, handing out rewards and using praise.

Older learners on the other hand, approach the formal learning context from a different perspective. First of all, there is no imperative, legal or otherwise, externally which prevents them from exiting the learning context if they are not happy with it. In other words, it is all too easy for older learners past the age of compulsory education to drop out of a learning context in which they feel uncomfortable. Some of the motivations that bring them to formal learning in the first place may arise from a thirst for knowledge and understanding, a desire to acquire an economically useful set of skills or knowledge or simply to enhance leisure time. One of the key tasks of the adult educator is to help learners to explore these motivations and imperatives and to assist them in identifying those they can endure during what can often be an arduous task of changing the way one looks at, and works in the world.

6. **Dilemmas**

From an adult education perspective, one of the tasks that confronts the educator is helping learners to leave behind some of the assumptions they have made about learning and the relationship with a 'teacher'. It is about helping learners to liberate themselves from the 'learning legacies', which they bring to the learning context in helping them to identify the positive and appropriate motivations and imperatives for learning. One of the most important strategies available to the adult educator in helping the adult learners unlock their potential, is presenting them with 'dilemmas'. These are often referred to as disorienting dilemmas.

The technique is used in order to draw attention to the habits and legacies of adult learners that are interfering with the acquisition of new ways of thinking. For example, an adult educator could simply turn around to a group of adult learners and say, how would you like this class to be run? For most learners who are used to being provided with a formal curriculum and a set of learning objectives, such a loose approach can create difficulties. Quite often, adult learners become angry with the educator for not taking more control. Nevertheless, in order to unlock the potential of adult learners, it is essential that the educator provide experiences, which challenge them and confront existing views on how the world works.

7. **Autonony**

This is a characteristic clearly distinguishes younger learners from more mature learners. Younger learners have little autonomy, or room for manoeuvre when it comes to attending formal educational activity. Older learners have become more autonomous in the way in which they live their lives and in many cases, particularly in higher education, crave that autonomy in order to participate in formal learning activities and in order to achieve qualifications and knowledge.

The role of the adult educator is to assist the adult learner to incorporate their sense of autonomy into a set of learning strategies that assist them in coming to terms with new ways of thinking and learning. Fostering the involvement of adult learners in the learning process through collaborative and transformative learning, is at the heart of adult education.

1 Types of Learning

What's my motivation?

Life-long learning has become a pervasive concept in adult education. It was first muted as a concept in everyday life over 80 years ago, but has recently become a pillar of many statutory approaches to citizenship and social inclusion. It is important for the adult educator to be aware that learning takes place on a range of different dimensions at the same time. Traditional approaches to instruction tend to emphasise the acquisition of knowledge and skills throughout a structured programme of learning objectives and learning activities. Nevertheless, even within such approaches to learning, the issue of attitudes is also of primary concern.

People learn respect for others, tolerance of diversity and ways to approach those who disagree with their views. Some of this learning involves the acquisition of persuasive strategies and approaches to negotiating reality with others, an important aspect of life-long learning is the exploration of ones own identity. Identity is built from experiences in dealing with others and with the external environment and it accumulates over the lifespan. Many learners, and particularly those who are returning to learning over an extended period of time, bring with them counter productive learning identities. Over their lifespan they have accrued a set of values, which inform their decisions in life. For example, some learners place a higher value upon status than others. Equally some learners prioritise career progression above other types of values such as spiritual values or emotional values. Adults apply values in an implicit way. That is, they have acquired habits of being and doing that are informed by their sense of identity and their value system. Some of these habits have the advantage of protecting the adults' identity as a learner from the experience of failure.

However, an adult learner that has accumulated habits to avoid failure is in a very weak position to learn from their mistakes. Once again, the task of the adult educator must be to assist in a gradual and persuasive way, and to examine the values and habits that they bring to the learning context. At the core of this process, is helping adult learners to reflect upon themselves as learners. It is about assisting them to gain insight into the way in which they jump to conclusions and knee-jerk into positions that can be counter productive in terms of learning. Thus, while the focus of an adult learning context may be the acquisition of knowledge and skills, such as IT skills, there is a requirement on the educator to ensure when confronted with complex and frustrating problems, that adult learners divest themselves from some of the counter productive approaches that they have developed during their life experience.

Adult learners also bring to the learning situation, a well developed and inter-connected set of 'frames'. Frames are inter-connected and organised sets of concepts that represent broader aspects of knowledge. The advantage of a frame, is that it makes it easier for the learner to identify similar types of knowledge within the external learning context. For example, the context of democracy is not simply reflected in a definition from a dictionary. The democracy frame for an individual involves many aspects that denote the political system but also has connotations such as loyalty, a cultural identification and experiences of participating in elections etc. By applying the democracy frame to other political ideologies and approaches, adults come to conclusions and views about those systems and about democracy itself.

The frames are very useful when they are compatible with the knowledge and information that is being acquired by the learner. But they become a problem when they limit the learning roles and perspectives of the learner. An excellent example of this can be found when adults return to the learning context after many years of having played alternative roles in life.

1.1 Learning and Education

The distinction between learning and education is very important in the context of adult learning. People are learning all the time in their daily life, mainly through incidental learning and significant experiences. It is for this reason that experiential learning is one of the key approaches to be adopted within the adult sphere.

1. The two basic processes that are involved in learning are those of storage of information and knowledge and the reproduction of that information and knowledge at an appropriate time. Often when people are experiencing difficulties in acquiring new knowledge, it is possible to work with them to distinguish the source of the learning difficulty. The storage and reproduction of learning interacts significantly with learning style.

   One way to view the learning process from a storage and reproductive perspective is to see it as a filing process. Thus, if a learner stores information in a certain format and then tries to reproduce it using a certain format, there will be a mismatch between storage and reproduction and as a result, there will be a failure of learning. Learning skills are not explicitly taught within the formal curriculum and as a result, most people learn their approaches and strategies to learning informally and implicitly through learning experiences. For example, it is possible to see a student using a highlighter to highlight information within a text book and to notice that the text book itself, is turning yellow. Highlighting only works for those learners who are good visually and only when it is used sparingly. If a learner who has a motor or kinaesthetic learning strength uses a highlighter, then the likelihood is that the information remains on the page for that learner.

   One way to empower learning within adult learners is to provide them with a range of strategies and let them decide which ones work best, thus highlighting could be followed by note-making or the development of mindmaps. It is also important to distinguish between storing and recalling information. One of the key difficulties faced by people with learning disabilities is not that they have difficulty learning and storing information, but that they have difficulty in easily accessing that information at a time and place when it is relevant. It is though the information that has been learnt, has been filed away with an inappropriate marker within the knowledge frames of the individual and thus becomes inaccessible at an important point in time. This can happen for any learner under stress, particularly in exams. In order to assist adult learners to reproduce the learning they have acquired, it is important to heighten their awareness of the need to reproduce learning in a similar way to that in which it was stored. For example, if an individual has been using mindmaps to store knowledge and information, then rather than attempting to go directly to text within an exam, this learner should first of all produce, and outline, a mind map. Another important consequence of the storage and reproduction model of learning, is that the capacity to learn within a particular learning domain increases as one learns. This can be described as the cycle of empowered learning. Thus, the more one learns about a topic, the easier it is to learn more.

   This is an important concept for educators to highlight for learners returning to learning. It is essential that they are made aware of the importance in investing in basic knowledge and creating initial frames in order to accommodate to a new area of learning, so that later on they can become expert learners within that domain.

2. As learners develop, it is important that educators assist them in getting in tune with their own knowledge. Thus, if one thinks one know something, then the chances of learning about it are diminished significantly. If one is aware that the knowledge is deficient then the possibility of learning is enhanced. A problem for all learners in an information society, is discriminating between relevant and important information and information that can be ignored at a certain

time. Because the sense of knowing is subjective, many adult learners have an inaccurate view of the level and depth of their knowledge in many areas. This occurs because modern media can provide its audience with instant access to a wide range of knowledge and information at a superficial level. Because one has watched a documentary on the Darfur region does not necessarily mean that one knows very much about what is actually going on in the region. Thus the adult educator must confront learners self-belief in the depth and breath of their own knowledge. One of the ways of approaching this is to help learners to distinguish between four levels of knowing.

At the first level of knowing are data. Data are points of information in various formats including numbers, words and visual representation such as signs and signifiers. Having access to data does not mean one actually knows anything. One can see data coming in on a screen without actually understanding the meaning and importance of it. Data only becomes useful when it is transformed into information. Information is important but it is generally at a relatively superficial level and can only become useful to a learner when it is integrated into his or her own knowledge. Thus the transformation of information into knowledge is a key aspect of the learning process. Finally, knowledge in itself, while important, is not sufficient for informing action. Knowledge only becomes useful when it is transformed into wisdom and thus influences the judgements and actions of the learner. This process of transforming data into information, knowledge and then wisdom is an important process to emphasise for adult learners.

3. Adult learners are involved in a wide range of different knowledge acquisition activities. Many of these are related to skills and competencies required within the occupational sphere of their lives. The acquisition of technical skills is well covered by the theories of instructional design and the setting of learning goals. At the core of the training paradigm is the procedure of task analysis. It is possible, through a detailed task analysis, to identify all the aspects of a specific task that need to be acquired in order for that task to be carried out effectively by an individual. This technical analytic approach to learning works extremely well in most aspects of the empirical domain of learning.

   Adult education on the other hand, has an important emphasis on learning about oneself as a citizen and learner. It is not possible to reduce this type of personal learning into a set of task demands, each of which can be acquired in sequence and which additively add up to being able to act as a competent adult. Adult education is not easily trained by an instructional design approach. In fact, many adult educators would propose that it is important to allow the learning group to choose the learning goals based on their own social motivation and external imperatives. Within an adult education context, the development of a formal learning plan for a group would be an extremely restrictive strategy. In between the analytic approach associated with training and the empowered approach of adult education, there exist a range of skills which have been referred to as ‘soft skills’.

   Soft skills are not conducive to the rigor of instructional design as developed within training. Neither are they best imparted through an empowerment approach through learning. Nevertheless they are critical in both spheres. Soft skills describe the kinds of things we do to get on with each other, to deal with unforeseen occurrences, to persuade someone of your point of view, to cope with stressful situations and/or to tackle a challenging task. The imparting of soft skills has become an essential part of the training sphere and is relevant regardless of the level or seniority of a person in their occupational or cultural life.

4. Many of the educational approaches that are outlined in this handbook recognise that education takes place through facilitating constructive teaching. Constructive teaching is based upon a

learning partnership between the educator and the learner and collaborative learning relationships between learners in a group. At the heart of the constructive teaching philosophy, is the view that the main role of the educator is to create context and environments within which learning is possible, rather than imparting specific aspects of knowledge or skills to the learner.

Even within the technical analytic domain of learning, it is no longer possible to assume that an educator can frontload a learner with all the knowledge and information they need, to perform effectively within a particular sphere of confidence. This is particularly true within the area of ICT. The speed at which information and communication technologies are evolving mean that within a very short period of time, a persons skills will become redundant. Constructive teaching aims to create ambitious but attainable tasks, which challenge the learner to generate their own problem solving strategies and to provide learners with the techniques required to assess the success and impact of their own learning. Constructive learning has the added advantage that it provides an opportunity for learners with different learning styles to work together to resolve problems. A particularly well developed version of constructive teaching is Problem Orientated Learning.

Problem Oriented Learning is the way in which the University of Maastricht in Holland delivers most of its University courses. The way in which the system operates is that the academic staff come together in advance of the academic year, and in collaboration, create a set of learning problems, which are published for the students in booklets. Each set of problems is designed to be resolved within a 6 week period. There are no lectures, only consultation groups to which students can turn up if they wish. The main role of the academic is to facilitate students in finding ways in which to resolve the problem. A comparison of this approach for medical students was carried out with more traditional approaches and the findings of the study confirmed that Doctors who are educated through a problem orientated approach, were just as competent as Doctors who had graduated through more formal teaching approaches, but that those who had learned through the problem oriented strategy, were more flexible in dealing with unexpected problems.

1.2 Strategic Teaching for Learning Empowerment

The educational approaches that have been collated within this handbook, have been chosen because they, in various ways, incorporate, the key principle of independent learning for adolescents and adults. Not every educational approach will be appropriate for every learning task. However at the core of the approach adopted to adolescent and adult learning is differentiated teaching.

The principle being proposed is that the educator should take a diverse perspective, not only on the different levels of capacity, knowledge and cultural differences within a learning group, but also base their choices of educational strategies on the lifespan developmental diversity within the group. There are a number of important principles that can be discerned in the range of educational approaches within this handbook. These include;

1. **Perspective Transformation**

   Perspective Transformation describes the process where learners are assisted to change the way in which they view themselves as citizens and as learners in order to assist them to become more reflective about the things that inhibit their learning and the ways in which they can become more effective learners. Perspective transformation is more important for adult learners, than for adolescent learners although critical reflexivity is important for both. So the concept of perspective transformation is applied to helping learners become critically aware of the values and habits they bring to their own lives and to reflect upon the structures and external contexts which influence their views and values. It's about helping learners to gain a critical insight into themselves as learners, as members of a learning community and as productive citizens.

2. **Matching Educational Approaches to Appropriate and Agreed Objectives**
   The diversity of perspectives, which can be taken upon matching of approaches to education and to the learning requirements of a particular group of learners and a learning context, is extremely broad. The lifespan developmental diversities, the learning style differences, the cultural perspectives and the domains in which learning must take place, need to be incorporated into the educators repertoire of approaches. At the level of the match between the learning task and the individual learner, there are many approaches that can be applied to ensure that tasks are appropriate and achievable by the learner. Many of these have been described within this handbook. But the handbook also contains a variety of other, systematic approaches to assist learners of all ages, to become more constructive and independent autonomous learners.

3. **Teaching & Learning Strategies**
   At the core of many of the educational approaches in this handbook , is the principle that it is not sufficient to teach people content and skills. Providing learners with a repertoire of effective learning strategies is also a fundamental part of the role of the educator. Learning strategies can be taught in a direct and analytic way, for example, it is possible to teach learners how to use various techniques for the storage and reproduction of knowledge. However, experiential learning is probably one of the more effective ways of assisting people to learn how to learn. In this regard, a number of systematic strategies have been included that require the learner to generate their own content and their own learning through facilitative techniques.

4. **Utilising Self Monitoring Methodologies**
   Effective learning requires the learner to be, at all times, in touch with their level of knowledge and skill in relation to the domain and sphere of learning involved. As we progress through the formal educational system, from primary to secondary and even onto third level education, we come to rely upon feedback from our teachers through assignments and exams to validate the quality of the learning we have achieved. While it is important from the point of view of accrediting learning and providing for qualification standards within technical domain, that learning is externally and objectively validated within the individual process of learning, it is equally important that people can self monitor the level of their own skill and learning.

   This is influenced strongly by previous experience and the temperament of the learner. There are some learners who take an optimistic view of their level of knowledge and capacity in relation to a task, and consequently miss out on certain aspects of a task that they have failed to understand or acquire. Other learners come to the learning situation with a more conservative view. These tend to shy away from taking risks and as a result miss out on opportunities to learn by doing. The adult educator has a responsibility to emphasise for all learners, the usefulness and importance of self-monitoring learning in all learning tasks.

5. **Establishing Ownership of Outcomes**
   It becomes easier to self-monitor ones learning when one has an ownership of the learning outcomes. During formal education, students are rarely required to take ownership of learning outcomes. Learning outcomes are owned by the educational system and specified within formal syllabi and curricula. The outcomes, in many cases, aren't even known by the students until after the teaching has taken place. Nevertheless, it has been demonstrated many times that spending sufficient time on assisting learners to understand and own the result of a learning activity, places them in a better position to self monitor, but also empowers them to take responsibility for adapting their learning approaches to the requirements of the task in a more independent way.

Owning the outcomes of a learning task, is at the basis of students and learners taking initiative. One important advantage of allowing learners to take ownership of learning objectives, is that they can specify the outcomes to fit with their aspirations and their sense of their current knowledge.

6. **Differentiated Education**
   As described earlier, the use of differentiated educational and instructional techniques is an essential element of inclusive education. By designing learning experiences to incorporate the range and diversity of learning styles and abilities within a learning group, the educator ensures that the maximum number of learners will benefit from a learning session. Consequently, it is not recommended to adopt one or two of the approaches presented within this handbook, but rather to adopt the principles underpinning the approaches and to use a range of approaches in a selective way based on the type of learning that is required by the learning group or individual.

7. **Procedural Facilitation**
   Facilitating learners to actually perform tasks that they currently do not have the knowledge or skills to carry out on their own, is a very useful approach to creating motivation and ownership of learning. Procedural facilitation describes a way of structuring tasks so that some of the learning demands have been reduced or removed, so that the learner can experience what its like to actually carry out the task in advance of learning all the procedures and steps required to do that task independently. This is different from substantive facilitation in which the educator actually carries out part of the task on behalf of the learner.

   Substantive facilitation disempowers the learner because elements of the task that are essential are not visible to the learner. Procedural facilitation on the other hand, provides a structure in which the learner carries out all elements of the task, but the knowledge demands for each element have been reduced or supported. An example of the use of procedural facilitation in driving a car is where the learner has control of the steering wheel and the pedals, as well as the gears, but the instructor has a parallel set of pedals to ensure that the learner does not have to pay full attention to everything that is going on in the street. Driving instruction is an excellent example of procedural facilitation and the fact that it is so successful for so many people, demonstrates it's usefulness.

2. Learning in Adolescence

What's my motivation?

Adolescence is a time of transition, some might say upheaval. The challenges facing the adolescent are both general and specific. It is a time when an individual can acquire new competence and abilities, it is a time of great potential but also of substantial risks. The main transition challenges facing the adolescent have been well described. Erikson (1968) has highlighted and emphasised the search for autonomy and the development of autonomy. It is a time where a person's self concept is being developed and honed. It is a time when personal self belief can be built and 'me' choices are made. Other peoples reactions are very important, including both peers and teachers, in terms of learning about one's own limitations and one's own abilities.

Adolescence is about building and developing relationships. Teenagers gradually transition in terms of their personal relationships and relationships with work. It is also about transforming parental relationships from one of dependency to one of co-dependency. It is also a time when the issue of occupational or career direction becomes a focus. There is an increased emphasis on social status. Participation in sports & leisure activities increases. Thus, there is progressive pressure on school based and learning based activities. The level of investment that an adolescent puts into curricular and non-curricular activities has long term consequences in terms of academic progress, career choice, socio-cultural participation and physical, cognitive and social activities in adulthood.

"The adolescent years represent a critical period in human development during which young people work towards establishing independence and during which contexts outside of the family become more important. The choices adolescents make and the opportunities made available to them during this critical period, may have life long implications for their emotional and physical well-being. Researchers have documented that patterns of behaviours initiated in adolescents often carry through into adulthood". (MAGGS, Shulenberg, and Hurrelmann, 1997)

2.1 The Adolescent as Scientist

George Kelly proposed that the way in which human beings learn is more akin to the approach of a scientist, than to that of a laboratory animal. He stated that humans are born making hypothesises about the world around them but then acting on these hypnotises and evaluating the feedback received. On the basis of this information, perceptions and behaviours will be maintained or adapted. Adolescents operate in this manner in a more self-conscious way than younger learners. They experiment not only with social and cultural activities but also within formal educational settings. In effect, teenagers are attempting to construct themselves and to self perceive their abilities and inabilities.

The cycle of transformation begins with the formulation of an anticipation as to how a particular engagement is likely to turn out. Most anticipation can be primarily negative or positive or neutral. The individual then invests within the interaction or event both emotionally and in terms of effort. Then the interaction or event occurs and the individuals understanding of themselves and the situation is either validated, in which case that behaviour or expectation is repeated, or invalidated, in which case the person must constructively revise their view of reality. At the core of this process of construction is the ability to deal effectively with success and failure.

"Failure and success go hand in hand. Even high achievers experience learning plateaus, temporary set-backs and unexpected failures throughout their school careers. How one responds to failure, particularly failure at tasks that are valued, appears to be an important determent of motivation and achievement". (Austin & Vospoel, p42)

The way one responds to failure is critical in the learning process. After one's anticipations have been invalidated in a learning situation, there are three choices available to the learner. On the one hand, they can change their approach or their perception of the situation. On this basis, one would try something new. In the second place, one could reapply the approach already attempted on the basis that it wasn't implemented effectively the first time. However, if this approach is used repeatedly, it results in frustration on the part of the learner and a reduced likelihood of effective learning. In the third place, the learner can disengage on the basis that the sense of failure is impacting on their personal self-believe and self concept. Disengagement inevitably leads to a sense of isolation and a disconfirmation of self. Repeated failure within an inflexible learning environment leads to learned helplessness.

An important aspect in the success/failure continuum is the way in which the learner attributes the reason for success or failure. Thus, how a learner understands and interprets why achievement events occur, is at the centre of how they will learn. It is possible to attribute learning events either to oneself or to other factors. When asked to indicate which factors were important within learning events, learners either attributed success and failure to their ability, the effort which they invested, the extent to which they persisted, the strategies they used, the meta-cognitive skills in problem solving they applied or the interest they had in the task. The alternative attributions were to look at the difficulty of the task, family factors, teaching factors or peer factors.

As with any scientist, the level of prior knowledge that the learner has about either the learning context or the content, the more likely they are to be able to integrate new knowledge into their existing world view. The level of prior knowledge is an extremely important factor in the learning process and can predict student success. Two kinds of prior knowledge are important subject knowledge and knowledge of the learning environment. On the positive side, prior knowledge influences motivation to learn and the better understanding of task difficulty which leads to more effective health seeking behaviour. Teenagers bring the technology savvy to the learning context while most return-to-learning adults, do not. Our lessons are constantly targeted by the media and thus have been exposed to a wide range of domains of information. Prior knowledge also influences student behaviour, study skills and students with high prior knowledge have more elaborated frames that assist them in pattern recognition and the integration of new information into existing knowledge structures. However, high prior knowledge interferes with learning when the learner over estimates the level of their understanding of the topic and where the learner has a superficial feeling of knowing a topic. Learners with high prior knowledge can be less inclined to seek help, persist to solve problems after failure and take a more superficial approach to help. Students with less prior knowledge ask more appropriate questions, but do not always benefit as much from help as those with high prior knowledge. The more successful learners ask more frequent questions. Thus, it is important to compensate for those students who are disinclined to ask for help. This can be compensated for by meta-cognitive skills training and by choosing domains where interest is high and students are motivated.

The key to creating a successful learning context for the adolescent is to achieve goodness of fit between the adolescent's personal characteristics as a learner and the learning approaches available. Thus, the educator must take account of the learners learning style, learning strategies and learning beliefs. An important aspect of this is the way in which adolescent students seek help.

Learning is also affected by the adolescents belief in what knowledge is and how it is gained. Learners who believe that knowledge is absolute and can be achieved through an accumulation of facts are likely to perform better upon direct tasks but have difficulty in transferring the key elements of learning to other tasks. Learners who are of the opinion that knowledge is relative and contextual are much better able to transfer knowledge into other contexts. Thus a learner's beliefs will influence their strategies. Learning strategies are often referred to as meta-cognitive skills in that they involve mainly self regulation of the learning process. The strategies are also influenced by the goal orientation of the learner. Some learners are orientated towards learning outcomes whereas others are orientated towards performance outcomes. Thus students who are oriented towards learning goals are likely to be motivated by internal factors whereas those who are oriented towards performance goals are more influenced by external factors and can view their abilities in a relative way to others. These factors influence the purposefulness of the learner within the learning context. Ironically, those with a greater prior knowledge of the learning environment and who are flexible in the way they self regulate, are likely to demonstrate high achievement. They are likely to have more control over the learning process, be able to monitor their own comprehension, make appropriate preparations for the learning context and be able to evaluate the learning outcomes and the effectiveness and help provided.

2.2 Help Seeking Behaviour

An important learning strategy that can influence the way in which an individual learns and how effective and deep that learning is, is the way in which the learner seeks and uses assistance available. Help seeking behaviour can be described in terms of five elements (Nelson – Le Gall, 1981).

1. **Awareness of the Problem (Meta-cognition)**
   If one is not aware that there is a learning problem, then one is unlikely to seek help. Becoming aware that there is a need for help requires the learner to assess task difficulty and to monitor their progress on an on-going basis. Thus, it is important to be able to evaluate one's own understanding of the task and to relate one's current knowledge to the knowledge that is required to carry out that task.

2. **Decision to seek help**
   There are a number of factors that might influence a learner not to seek help or ask a question. An important influence in this regard is not being afraid to express one's ignorance in public. Many learners do not seek help appropriately or in a timely fashion because they hesitate to reveal to their peers and to the instructor that they do not understand the learning task. Other influences on the decision to seek help or the priority with which the learner wishes to solve the problem is the extent to which the learner decides to rely on self explanation.

3. **Identify potential helpers**
   Key in deciding who to seek help from, be it from the educator or peer or a parent, is the perceived competence of the help provider in the domain in question and the degree to which the helper is perceived to be sensitive to the learners needs.

4. **Eliciting help**
   It is not always an easy task to get the kind of help you need at the time you need it, from the helper. Thus, the way in which the help is provided will impact upon how well the learning task is performed. Eliciting help effectively requires a sophisticated knowledge of human relationships and discourse on the part of the learner. One must be able to guide the helpers so that the help provided matches the task demands.

5. **Evaluating the result of the help**
   The key questions that the learner must ask about help provided is to what extent did it actually solve the problem and is there a need for a new or different helper in order for the learning task to be completed. This evaluation is carried out on the basis to the extent of which the new information has been integrated with existing knowledge and a judgement on the quality of the help.

   Learning strategies, styles and beliefs are also influenced by the personal characteristics of the learner. For example, the age of the learner intrudes as to the extent of which a learner is aware of problems, the sophistication with which help is selected and the way in which previous help can be reused. Older teenagers are also better able to self reflect upon knowledge. From a gender perspective, boys are likely to avoid help, be less interactive, are less concerned with feedback and less proactive in learning tasks.

2.3 Adolescents and Work

Work takes on an increasingly important role within the adolescent frame of reference. The concept that teenagers should not work and remain in education is of relatively recent origin i.e. the last 150 years. In fact, the majority of older teenagers do work and have disposable income that makes them one of the more important consumer markets in the current day and age. There is a debate about the advantages and disadvantages of teenagers working but one way or the other, the fact that teenagers are engaged within work settings in their extra curricular lives is an important aspect for educators to take into account.

Exposure to work in a structured way through internships and job shadowing have significant benefits for teenagers who are making transition choices. It is not so clear that non structured exposure to work has the same impact. Nevertheless, being involved in work settings contributes to the development of an individuals identity and their autonomy, provides them with a sense of responsibility and builds their confidence. Work can also be a factor in the development of better time management, more effective interpersonal skills and the development of job related skills. The issue is less about whether work is a good idea or not for teenagers but the way in which the choice to go to work impacts upon other activities and in particular, participation in formal educational settings. Teenagers who work have to make choices between the time they spend at work, at school, doing homework, being involved in social situations, participation in extra-curricular activities and doing chores at home.

The consequences of these choices can be described in terms of work related cognitions in attitudes, the impact upon family relationships, the impact upon school performance and the psychological impact on the individual. Among some of the negative impacts of being at work for adolescents are that it is associated with proper behaviours in relation to study time, the quality of school work and parental relationships. Other concerns identified are health behaviours such as consumption of alcohol or the use of illegal drugs. Negative outcomes are not associated with work itself but rather the intensity of work. Thus it appears that teenagers that work over 20 hours per week, are more likely to exhibit problem behaviours. Other negative impacts arise from exposure to work stress for teenagers. It is critical that the educator acknowledges the work life of teenagers in their classrooms and other learning settings.

2.4 Interactive Learning Environments

Teenagers are exposed to different educational environments when they make the transition from primary to second level education. They move from an environment where personal achievement is valued to a context within which comparative success is highlighted. They move from a learning environment within which the development of primary information processing skills and abilities such as reading and writing become less important than the storage and recall of academic content.

The primary means of judging success in secondary education is performance in tests and exams. This calls for a whole new repertoire of skills on the part of the teenage learner. Self regulation and meta-cognition are important but some practical strategies are also necessary such as note taking, flexible reading, study skills, the ability to revise ones own text and planning and time management. The teenage learner also finds themselves in an environment which has a top down educator focus rather than a person centred focus. The environment is generally curriculum centred and targeted around specific subjects. Learning structures within the second level environment are more likely to emphasise ability groupings, competitions and the public evaluation of learning. Many of the approaches adopted are teacher directed, mechanistic and simplistic and not necessarily responsive to the social, emotional and intellectual needs of the adolescent who is developing for the first time, a consciousness of their abilities of limitations and who are vulnerable to social pressure and identity confusion. Thus, there is a responsibility on the educator within adolescent learning contexts to develop a more interactive approach to the creation of learning environments.

"...the environments adolescents experience are critical in that they provide opportunities for maintaining or changing behaviours that may influence their development either for better or for worse."

At the core of an interactive environment is the micro-system within which the learner is operating. One of the key challenges facing the developers of computer assisted instruction is finding ways to emulate the learning relationship between a learner and a good educator in a digital environment. The relationship with the educator is key and can influence the perception that the learner develops about themselves as a learner. Good relationships with an educator can fundamentally influence the way in which the adolescents learning concepts develop. Thus, teaching strategies should be informed by the characteristics of empathy, civility and moral development. Educators should strive to create engagement and to provide appropriate support and help at the time required. It is important that educators question their own beliefs about learning, modulate the interest they show in the learners success and failures, modulate the way they provide feedback and to guide the learners perception by the use of advance organisers. Section four of this handbook provides a number of different teaching techniques which can achieve these goals and promote independent learning on the part of the learner. However, it is useful to consider a number of these in brief at this point.

Some of the most useful educational strategies for an educator working with adolescent learners include;

- → The use of research based or problem oriented learning environments. This is one way to encourage teenagers to take responsibility for their own learning and to develop collaborative approaches to learning tasks
- → Highlighting the essential components and principles underpinning a task rather than simply providing elements of knowledge and details
- → Promoting student enquiry through the use of self-explanations and the provision of appropriate and timely and instructional help
- → Building into the work programme of the group, a range of self directive activities
- → Creating opportunities for self evaluation, reflection and the application of learning
- → Using authentic tasks rather than simulations

- → Ensuring that learning tasks are relevant to the individual
- → Emphasising pattern recognition, themes and questioning techniques
- → Creating a safe psychological environment which can facilitate relationship building and the building of trust between learners and between the educator and learner
- → Encouraging perspective taking on the part of learners so that they can appreciate the views of others
- → Using other interactive strategies such as debate, role play
- → Providing opportunities for learners to engage in personal reflection, not only upon domain specific knowledge but also upon the way in which they are learning
- → Focusing on the adolescent zone of potential development (ZPD). This is the essential ingredient of creating effective adolescent learning environments. Activities should be set beyond the independent capability of the learner but ensuring that assistance is available to allow the learner to carry out the task effectively. Within this approach, the educator is a learning partner to the learner rather than an instructor. The main concept is that learning tasks are challenging with assistance so the learning is co-constructed. Within a ZPD environment, what is assessed is the estimate of how much a learners performance could be enhanced with appropriate assistance and the extent to which this zone progresses. Within a ZPD environment, responsibilities for controlling is divided between the learner and the educator.

At the core of a ZPD approach to learning, is the way in which assistance and help is structured. It is important that the educator uses both self explanation activities and supporting instructional explanations. Self explanations can be facilitated by providing learners with worked out examples and asking them to explain why these are the case. One disadvantage of this is that self explanations are not always correct. Instructional explanations have the disadvantage in that they are not totally adapted to the level of prior knowledge of the learner but they can reduce illusions of understanding and can promote increased comprehension. The way in which self explanations and instructional explanations are balanced will depend on the age and prior knowledge of the learner. The rule of thumb for creating an effective ZPD environment is to provide for as much self explanation as possible and as much instructional explanation as is necessary. It is important to create an environment within which the learner can access explanations and help on demand but also where feedback is provided to reduce a learners illusion of knowing where this is not the case. Instructional explanation should focus not on detail, but on principles, frames and learning domains.

At the heart of the educators role with adolescent learners is how the learning relationship supports the learner in constructively responding to failure. The adolescent experiencing constant and unmediated failure will come to doubt his or her intellectual capacity. What can be learned is that effort is pointless and therefore disengagement and the ceasing of effort are the best way to ensure that failure does not occur again. Within the self belief and strategies of the adolescent who has experienced learning failure, a view that intellectual activity is unpleasant and is to be avoided can develop. This is not to say that the educator is the sole or even the main factor in school failure but that they can play an important and increasingly relevant role for learners experiencing difficulties. There are three major influences on school failure. In the first place, the biological, physiological and psychological functioning of the individual is important. Secondly, the social surroundings of the individual both inside and outside school are influential. Finally, the learning conditions can change the perception of the learner. Learning conditions include this curriculum framework and formal

education setting which is mediated by the educator on behalf of the learner. Thus educators can teach for future success.

2.5 Emotional Intelligence

The idea that personal and social factors are equally if not more important in success in both the workplace and in educational settings, is not a new concept. Although the term emotional intelligence did not become popularised until Goleman wrote his book in 1995, the non cognitive factors involved in learning and performance were described as early as 1920 by Thorndike and proposed as being essential elements by Wexler in the late 40's and early 50's. In fact, a number of the theories of emotional intelligence were being developed prior to Goleman's book. Even as early as 1962, the concepts of trust, respect and rapport were seen as being important characteristics of managers. Other similar concepts were proposed as being important including communications, sensitivity, initiative and inter-personal skills. The term was coined by Solvey & Mayer in 1990. Writers in the area all report that cognitive intelligence is not necessarily a particularly good predictor of success in life, or in job performance. For example, a longitudinal study carried out in Massachusetts indicated that handling frustration, controlling emotion and getting along with people were better predictors of success in work and life than cognitive measures. Two thirds of this cohort were from welfare dependent families and a third had IQ's of less than 90. Another study carried out retrospectively on PhD's who had qualified in the 50's indicated that those who performed better on measures of emotional intelligence, demonstrated greater success.

One of the original thinkers in the area of emotional intelligence (Bor-on) has developed an elaborated self report inventory that claims to measure emotional and social intelligence. Bor-on describes a number of different approaches to defining emotional intelligence. From one perspective, emotional intelligence is characterised as an ability to recognise, understand and describe emotions that facilitate thinking. These can be divided into psychological mindedness and emotional awareness. Another view of emotional intelligence is that it is the array of skills and competences that drive managerial performance. A third view suggests that emotional intelligence is the inter-related emotional and social competences, skills and facilitators that impact on intelligent behaviour. Gardener (1983) proposed the associated terms of intra-personal and interpersonal intelligence. Bor-an proposes that emotional and social intelligence is behind effective adaptation and therefore learning. He describes five types of ability which are involved in performing in an emotionally intelligent way;

1. The ability to recognise, understand and express emotions and feelings

2. The ability to understand how others feel and relate to them

3. The ability to manage and control emotions

4. The ability to manage change, adapt and solve problems of an interpersonal nature

5. The ability to generate positive feelings and be self motivated

In summary, emotional intelligence is about understanding and expressing oneself, understanding and relating to others and coping with daily demands. This requires an awareness of oneself in terms of strength and weaknesses and an ability to express feelings and thoughts in a non destructive way. It also requires an awareness of others emotions and needs and establishing and maintaining cooperative, constructive relationships. Emotional intelligence has been seen as an essential element for coping with and achieving personal, social and environmental change.

A number of instruments have been designed to measure emotional intelligence. One of these is the multi-factor emotional intelligence scale, 'MEIS' which combines a set of tasks proposed to require emotional intelligence and rating scales. Another tool is the emotional competence index. This scale is comprised of the ratings of others of an individual's performance as well as rating scales. Another rating scale is the EQ MAP which allows people to explore their own emotional intelligence. The instrument that has been in existence longest and for which there is more data to support it's validity and reliability is the EQ–I (the Emotional Quotent Inventory). Bar-on developed this over a period of ten years. It comprises of 133 items and is relevant to learners over 17 years of age. It takes about 40 minutes to administer. It is useful to look at the content of the EQ–I as it provides a very good overview of the content of emotional intelligence. The EQ-I has five composite scales and 15 sub-scales. These are:

1. Intrapersonal – self regard, emotional self awareness, assertiveness, independence and self-actualisation

2. Interpersonal – empathy, social responsibility and inter personal relationships

3. Stress Management – Stress tolerance and impulse control

4. Adaptability – Reality testing, flexibility and problem solving

5. General Mood – Optimism and Happiness

Using this scale, researchers have carried out a range of studies into the relationships of emotional and social intelligence with demographic factors and with success. One of the characteristics of emotional intelligence that emerges from this research is that it increases with age up to 40 years of age. This differs from cognitive intelligence which reaches its peak in late adolescence and mildly declines during the second and third decades of life (Wexler, 1958). Another difference between emotional intelligence and cognitive intelligence is that it is demonstrated that emotional intelligence can be trained and thus, younger learners can be helped to develop more effective emotional and social competence with a downstream impact on their learning and life success. There are no overall differences between the genders in emotional intelligence but there are some individual differences on certain factors. Females perform better on items relating to interpersonal skills, empathy, awareness and social responsibility. Males, on the other hand, perform better on intrapersonal skills, marrying emotions, adaptability, self regard, self reliance, stress coping, problem solving and optimism.

The actual EQ-I has also been tested for validity. The influence of emotional intelligence on performance in a number of domains can be separated out from the impact of cognitive intelligence and personality. The structure of EQ-I has also been tested. It is possible from this information to divide the EQ-I into emotional intelligence factors and facilitators of performance. Thus, self regard, interpersonal relationships, impulse control, problem solving, emotional self-awareness, flexibility, reality testing, stress tolerance, assertiveness and empathy can be considered factors of emotional intelligence. Whereas optimism, self-actualisation, happiness, independence to structural responsibility can be seen as facilitators.

In a number of studies, the EQ-I has been correlated significantly with a number of other characteristics. These include;

1. Physical health – emotional awareness, managing emotions and coping with stress, optimism and problem solving

2. Psychological health – managing emotions and coping with stress, drive to accomplish personal goals and ability to verify feelings

3. Social interaction

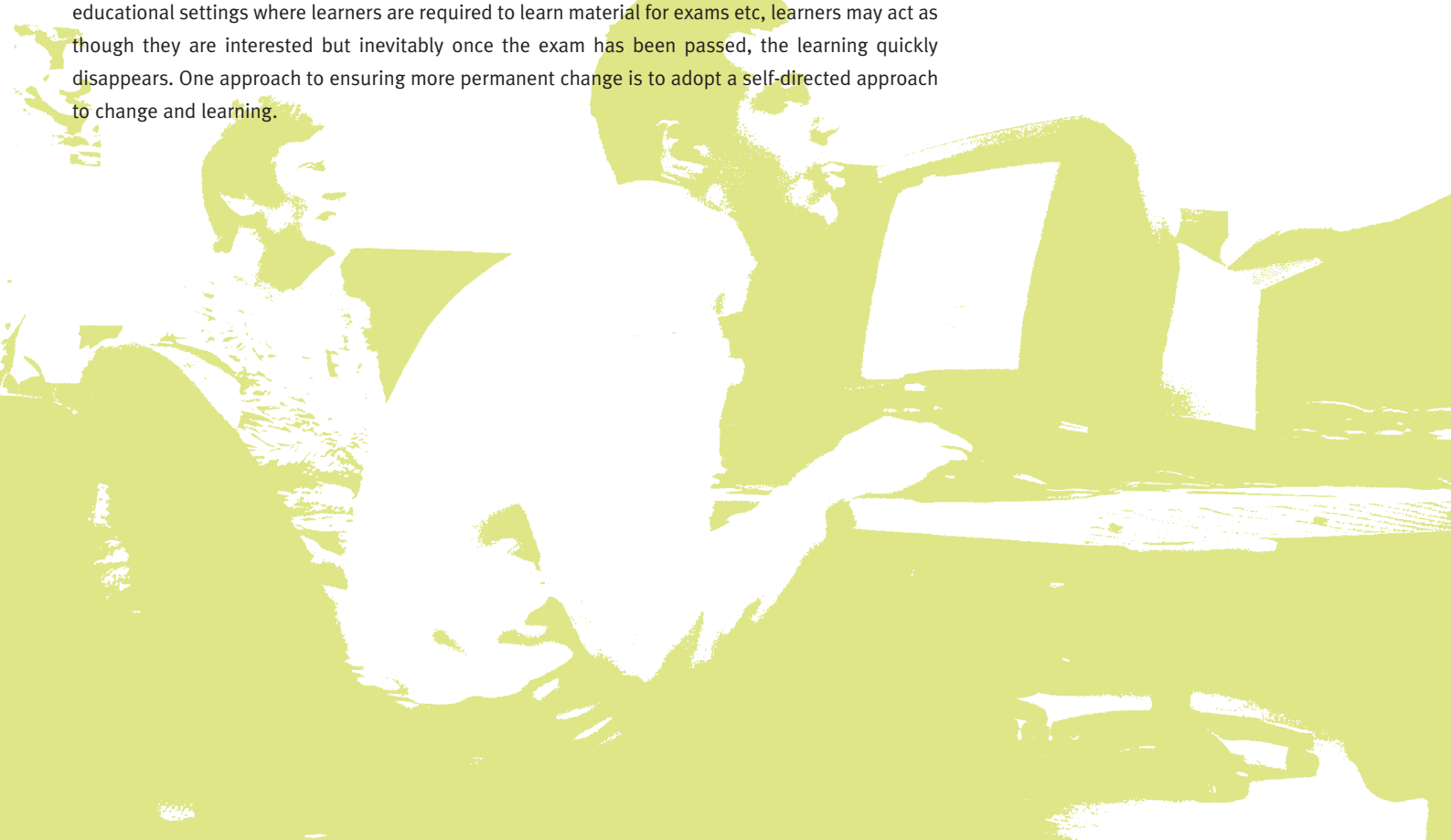
4. Educational performance in high school and college

5. Occupational performance - awareness and acceptance of self, awareness of others, managing emotions, being realistic and having a positive disposition

6. Self actualisation

7. Subjective well-being

The important thing about emotional intelligence is that it is teachable and learnable. This is particularly true of emotional self awareness and empathy. However, self-regard, self-actualisation, stress tolerance, reality testing and happiness have also been demonstrated to be teachable. The impact of teaching emotionally intelligent strategies has a long term effect on individual's behaviours and life success. One of the basis assumptions underlying the development of training programmes in emotional intelligence is that people can change their behaviour, their moods and their self image. However, it is important to acknowledge that learners only learn what they want to learn and other things are forgotten. Thus, if one is developing learning approaches that will have a long term impact then the involvement and ownership of the learner in the learning process is essential. Even in formal educational settings where learners are required to learn material for exams etc, learners may act as though they are interested but inevitably once the exam has been passed, the learning quickly disappears. One approach to ensuring more permanent change is to adopt a self-directed approach to change and learning.



3. The Charter of Andragogy

What's my motivation?

The term 'andragogy', as opposed to pedagogy, has been coined to represent the view that adult learners require to be related to differently than children. One important difference is that adults have accumulated knowledge and experience that can act either an asset or a liability in the learning process. Adults are also much more goal directed. They have to see a purpose for the things they learn or at least have an expectation that any new knowledge will help them achieve their goals. They learn better when they can use their knowledge in an applied way. This section describes the core principles of Andragogy.

There are many different perspectives on the practice of teaching and educating adults. It takes place in a wide range of contexts including the workplace, continuing and further education colleges or university. Other learning places include training facilities, community centers and rehabilitation programmes. It can involve either vocational education, formal education and training systems that mainly relate to skill acquisition, or informal adult education that is focused on personal development and consciousness raising.

In 1926 Lindeman described adult education as a process through which learners become aware of significant experience. This includes self-direction and critical reflection, both of which have since become substantial aspects of adult learning theory. The definition was reinforced by Knowles (1978), but the greater emphasis of his work lay in promoting the concept of 'andragogy', which he described as the focus of learning of adults as opposed to children (pedagogy). He suggested that the point at which a self-concept of essential self-direction develops is when a person becomes an adult. At this point a person can take responsibility for his/her own learning and becomes capable self-directed learning.

More recent research suggests that rather than a being a theory, andragogy is more a philosophy of education which provides useful guidelines to the teaching of adults (Burns, 1995, p.251). Drawing on the theories of these researchers, Burns (1995) suggested that the consensus of key concepts of the andragogical model include:

1. Adults need to know why they are required to learn something before being motivated to learn it.

2. In any group of adults, there will be a greater range of individual differences than among a school group.

3. In contrast to subject-centred learning in childhood, adults are task and problem centred in their approach, particularly to those problems which they face in everyday life in work, home and leisure.

4. Adult motivation appears to be based on intrinsic factors such as quality of life, self-esteem and job satisfaction, thus adult education should make optimal provision for differences in style, time, place and pace of learning.

5. Adults are responsible for their own learning decisions and their own lives.

3.1 Elements in a Charter for Andragogy

Andragogy, as a professional perspective of adult educators, must be defined as an organised and sustained effort to assist adults to learn in a way that enhances their capability to function as self-directed learners. To do this it must:

→ Progressively decrease the learner's dependency on the educator

→ Help the learner to understand how to use learning resources – especially the experience of others, including the educator, and how to engage others in reciprocal learning relationships

→ Assist the learner to define his/her learning needs – both in terms of immediate awareness and of understanding the cultural and psychological assumptions influencing his/her perceptions of needs

→ Assist learners to assume increasing responsibility for defining their learning objectives, planning their own learning programme and evaluating their progress

→ Organise what is to be learned in relationship to his/her current personal problems, concerns and levels of understanding

→ Foster learner decision making – select learner-relevant learning experiences which require choice, expand the range of the learner's range of options, facilitate taking the perspective of others who have alternative ways of understanding

→ Encourage the use of criteria for judging which are increasingly inclusive and differentiating in awareness, self-reflexive and integrative of experience

→ Foster a self-corrective reflexive approach to learning – to typifying and labelling, to perspective taking and choosing, and to habits of learning and learning relationships

→ Facilitate problem posing and problem solving, including problems associated with the implementation of individual and collective action, recognition of relationships between personal problems and public issues

→ Reinforce the self-concept of the learner as a learner and doer by providing for progressive mastery, a supportive climate with feedback to encourage provisional effort to change and to take risks and avoidance of competitive judgement of performance and appropriate use of mutual support groups

→ Emphasise experiential, participative and projective instructional methods and appropriate use of modelling and learning contracts

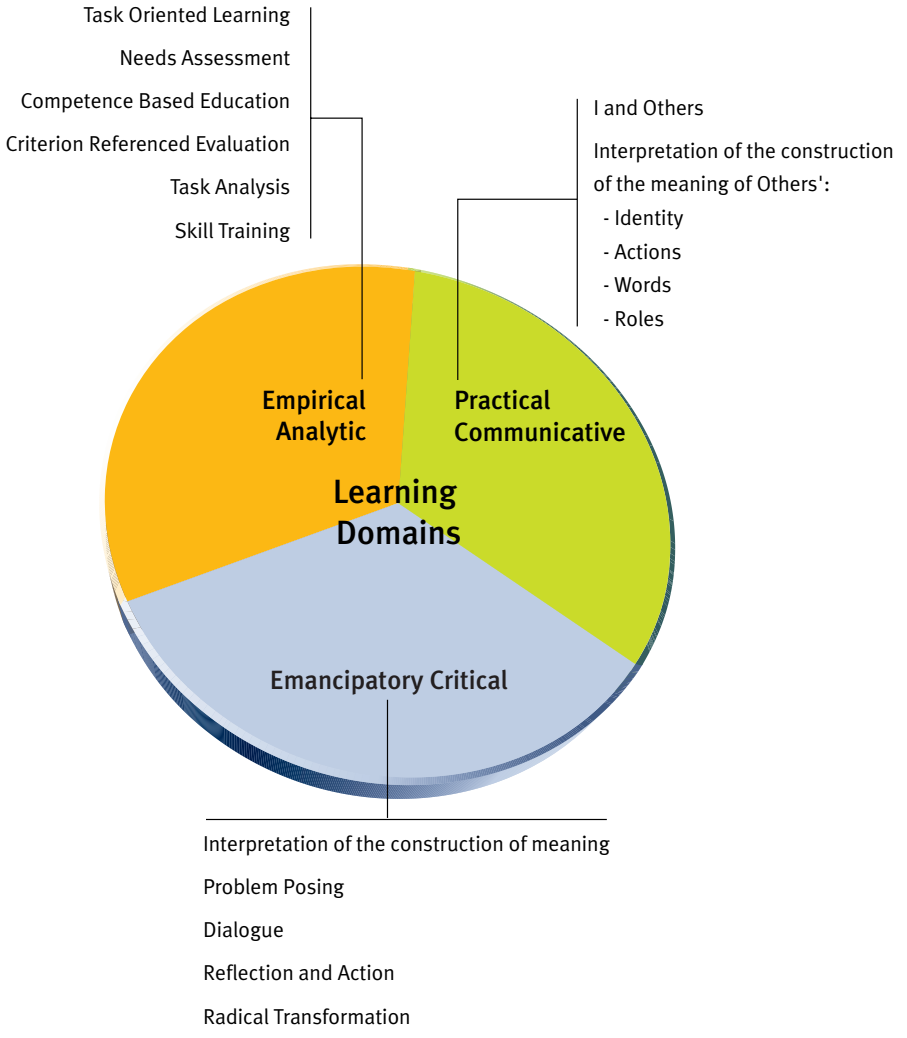
→ Make the moral distinction between helping the learner understand his/her full range of choices and how to improve the quality of choosing versus encouraging the learner to make a specific choice

3.2 Domains of learning

To appreciate the complexity of Adult and Adolescent learning it is important to be aware of the different types of learning that are integral to successfully negotiating life transitions. One way of characterising these types of learning is to represent them in terms of Learning Domains. This section describes the nature of each of these domains and proposes some approaches to education that are most appropriate.

The concept of Learning Domains was popularised by Mezirow (1981/1990), based on work he had carried out earlier and incorporating the work of Habermas (1970/1971). The idea of Domains of Learning is an essential element within the concept of transformational learning in the field of adult learning. Mezirow (1981) noted that Habermas (1970/1971) identified three general areas, or domains in which learning occurs. Each is interrelated, but each has a precise method and focus of objective enquiry. The first is technical or empirical/analytic learning which relates to instrumental action based on empirical knowledge and technical rules. This is the type of learning that is normally found in formal education. The second is practical/communicative learning for effective interaction with others through communication. This is about learning who you are and how to interact with others. The third domain is emancipatory learning through reflection and self awareness. This is about understanding how the external environment impacts on your habits of thought, action and values. It is through emancipatory learning that you begin to recognise the social and environmental constraints which may inhibit your life chances.

A illustration of the Three Domains of Learning is presented in the figure below.



1. **The Technical or Empirical/Analytic Domain**
   The major emphasis in formal education and training is upon the empirical-analytic domain of learning. This domain is about the acquisition of knowledge and skills related to the external context in terms of tasks and actions. It is about formal scientific knowledge, crafts and occupations, practical competence and skills. It is primarily about task oriented learning and is amenable to a task analytic approach which involves learning objectives, systems and methods of teaching and measuring objectives. It is where formal education and training are most relevant.

2. **The Practical/Communicative Domain**
   Formal education is less well prepared to support learning in other domains of life such as the practical-communicative domain in which learners construct meaning in terms of the way other people identify them, understand their actions and their words and how they construct economic and social roles for themselves. This type of learning also includes 'soft' skills and what are often referred to as Social Skills. Social skills training are often included in vocational education. Many of these courses apply a task analytic approach to social learning (e.g. Hopson and Scally).

   There are serious questions about the suitability of this approach to developing practical and communicative learning. For example, the development of self-concept involves a set of complex life interactions in which an individual begins to distinguish between the 'I' and others. It incorporates a fluid continuum of inter-relations and hypothesis testing on the part of the individual in relation to:

   → The way in which to act within social groups,
   → The best way to use language to achieve personal goals,
   → Acquisition of socially valued roles,
   → The construction of a meaningful representation of oneself within the family, community and society.

   It is difficult to see how a task analysis approach can create a systematic approach to social skills training, particularly if it must be relevant across cultures and the wide range of contexts that occur within a person's daily life. Social learning must occur within a social context and thus more experiential types of approaches are required to support informal education and social learning. This is a challenge for the educator who is based within a formal educational setting in which learners have aspirations and desires that span far beyond the confines of the setting and the syllabus. Nevertheless, many of the approaches described in Module 3 of this manual will assist in the domain of practical/communicative learning.

3. **The Emancipatory/Critical Domain**
   If formal education has limited application in practical-communicative learning, it is particularly ill-prepared to cope with emancipatory-critical learning. In this domain the learning task of highest priority is to understand yourself in the broader terms of the mesosystems i.e. the community and social structures and macrosystems i.e. political, religious and cultural systems (Bronfenbrenner 1979). Emancipatory-critical learning is about becoming aware of yourself as a learner and the influences that values, traditions and social structures have on the way in which you construct meaning about yourself, others and the wider world.

   It was this third domain with which Mezirow (1981) was most concerned. He suggested that if there are three distinct areas in which learning occurs, then there must be three different functions required of adult education. He argues that adult educators have failed to identify the distinction between the three areas of learning, having focused their attention primarily on the technical and

Who's Who

Paulo Freire was born in 1921 in Recife, North East Brazil. He recognised the culture of silence in which they lived and was very aware that their concerns and issues were not acknowledged by those in power. It is from this base that he developed his ideas. He went to university and studied philosophy of education In 1962 he set up in Recife a "Cultural Centre" as a replacement of traditional classes and lectures. Group discussions were developed with the aim of promoting (i) analysis of real-life situations and (ii) action inspired by this analysis. As a result of his work and experience he became in 1963 Secretary of Education and General Coordinator of the National Literacy Programme (in one project 300 workers became literate in about 45 days).

practical domains. He believed that emancipatory learning should be an inclusive and conscious part of the educational strategies employed in adult education programs, such as those developed for workplace learning with the aim of providing greater opportunity for critical reflection by learners.

More recently he has placed greater emphasis on emancipatory learning, highlighting communication and critical reflection as key aspects of transformation theory (1996/1999). His work has been criticised, however, he continues his research and to lead debate relating to transformation theory. Notwithstanding the criticisms of his (Cunningham 1991, Taylor 1997), transformation theory is held in high regard and continues to underpin substantial research in the field of adult learning (Cranton, 1996; Marsick, 1997; Dixon, 1999). Its value lies not only in providing a plausible and well regarded explanation of the complex nature of adult learning, but also in raising the parallel issues of the need for adult educators/trainers to be aware of this complexity, and their ability to incorporate methodology which will more effectively promote transformational learning in adult learning programmes. Some of the educational strategies presented in Module 3 are based on the work of Mezirow and the Charter for Andragogy presented in Section 2.5 is also derived from his work.

The most developmentally difficult types of learning for adults lie within the practical/communicative and emancipatory/ critical domains of learning. In basic terms, adults find it a great deal easier to learn a new way to do something at which they are already adept. They have rather more difficulty confronting their self constructed view themselves in terms of their habits of acting, thinking and perceiving, and acknowledging that the roles and meanings they see as their own are strongly influenced by institutions and processes beyond themselves. However, it is this type of learning that must take place for those who are returning to learning and those who have experience failure and frustration in the formal initial education system.

3.3 Education for Empowerment

The meaning of adult education was transformed by a Brazilian educator Paulo Freire who developed his theories while working with illiterate sugar cane workers. He came to the conclusion that adult learning had to be driven by preceived relevance on the part of the learners. It is not personal motivation that is important but the social motivation of the group. He viewed education as an instrument of political and cultural emancipation. This section provides a brief profile of Paulo Freire, an introduction to the principles he proposed and a review of some of his most important writings.

He wrote his most famous book, Pedagogy of the Oppressed, in 1970, but because of tensions with successive authoritarian military dictatorships it wasn't published in Brazil until 1974 when a process of cultural liberalisation commenced. He was Visiting Professor at Harvard Centre for Studies in Education and Development and he was a consultant to the Office of Education of the World council of churches in Geneva. During this time Freire acted as an advisor on education reform in former Portuguese colonies in Africa, particularly Guinea Bissau and Mozambique. He moved back to Brazil in 1980 where he joined the Workers' Party (PT) in the city of São Paulo, and acted as a supervisor for its adult literacy project from 1980 to 1986. When the PT prevailed in the municipal elections in 1988, Freire was appointed Secretary of Education for São Paulo. In 1986, his wife Elza died and he married Maria Araújo Freire, who continues with her own radical educational work. He died in 1997.

Key Principles of Freire

1. **No education is ever neutral**
   Education is either designed to maintain the existing situation, imposing on the people the values and culture of the dominant class (i.e. domesticating people, as one tames an animal to

obey its master's will) or education is designed to liberate people, helping them to become critical, creative, free, active and responsible members of society.

2. **Relevance – issues of importance NOW to participants**
   People act on the issues on which they have strong feelings. There is a close link between emotion and motivation to act. All education and development projects should start by identifying the issues which the local people speak about with excitement, hope, fear, anxiety or anger. The educator needs to listen to these 'generative themes', or hot issues, in order to tap the energy of the community.

3. **Problem-posing**
   From the beginning all participants are recognised as thinking, creative people with the capacity for action. The aim of the adult educator is to help them identify the aspects of their lives which they wish to change, to identify the problems, find the root causes of these problems, and work out practical ways in which they can set about changing the situation. The whole of education and development is seen as a common search for solutions to problems.

   Currently in education, there is too great a reliance on lecturing and memorisation at the expense of analysis. For example, presenting the dates of key historical events to be memorised without considering how they continue to impact on the lives and relationships of the learners treats them as containers into which learning is deposited. The bank approach aims to prepare people to respond better to current situations so that they can be controlled by them more easily. This results in passivity on the part of the learners and reduced constructive thought and creativity. These are the conditions that those in control need to remain in control and even to be perceived as being benefactors. This is reproduced by the banking approach to education.

   Freire proposes that education should instill in the learner a love of life by fostering the identity of learners within their own lives. Thus education then stops being mechanistic.

4. **Dialogue**
   The challenge to build a just, egalitarian socialist society is very complex. No individual knows exactly how to do it. No one has all the answers, and no one is totally ignorant. Each person has different perceptions based on their own experience. The so-called 'educated' have a lot to learn from the people who have been trained mainly through the institutions of the dominant class. To discover valid solutions everyone needs to be both a learner and a teacher. Education must be a mutual learning process. The role of the adult educator is to set up a situation in which genuine dialogue can take place – a real learning community where each shares their experience, - listens to, and learns from, the others.

   Freire argues that words involve a radical interaction between reflection and action and can be transformational. Dialogue is at the heart of his approach. This must be based upon mutual respect and cooperation between the educator and the learner within the broader context of the world that surrounds them. Traditional roles in education tend to limit what can be achieved and can dehumanise those involved. As a result dialogue is unlikely to occur and transformation becomes impossible.

   In order to achieve the conditions for active learning, it is important that a dialogue is established between the educator and the learner. Dialogue is the key element in learning. It establishes a mutual relationship between the two actors and a genuine ethos of acceptance and support. This is different to the kind of relationship sought by leaders who attempt to initiate dialogue to achieve their own ends and to convince people accept their current circumstances. It is a

dialogue that supports critical thinking and the construction of opportunities for liberation through conscious action.

Dialogue should use the language of the learner. For this reason the educator needs to assimilate into the life of the individual and the community and learn the language, practice and thought of the learners. This facilitates the use of problematising to construct knowledge based local issues and concerns rather than distant events and cultures. The content of learning is derived from the context within which the learners live out their daily lives but of which they are not initially aware. This allows the educator to assist the learners to progress from the particular to the general.

Educators must go to where the learners are and get to know how they think, act and hope. This helps to contextualise the learning and enhance its relevance to the learners' reality. Liberation is not achieved by the acquiring existing but by constructing your own ideas and through action and reflection.

The first step in establishing genuine dialogue is to become familiar with the thinking and values of the learners. The second step is to use this thinking in a systematic way to facilitate group and individual learning process and facilitating group interaction between the participants. This allows each participant to become conscious of his/her reality.

5. **Reflection and action (praxis)**
Most real learning and radical change takes place when a community experiences dissatisfaction with some aspect of their present life. An adult educator can provide a situation in which they can stop, reflect critically upon what they're doing, identify any new information or skills that they need, get this information and training, and then plan action.

Often the first plan of action will solve some aspects of the problem, but not deal deeply enough with the root causes of the problem. By setting a regular cycle of reflection and action in which a group is constantly celebrating their successes, and analysing critically the causes of mistakes and failures, they can become more and more capable of effectively transforming their daily life.

6. **Radical transformation of life in local communities and the whole society.**
This type of education aims to involve whole communities actively in transforming:

- → the quality of each person's life,
- → the environment,
- → the community,
- → the whole society.

It is not an individualistic academic exercise, but a dynamic process in which education and development are totally interwoven, it recognises that each person has a contribution to make in building the new society, and tries to help each person and each community become more and more capable of, and committed to, the service of the people and national transformation.

Freire proposes an alternative way to view dialogue that prioritises collaboration in the learning process. This arises from the union that occurs when a leader and the people genuinely communicate and interact to achieve the mutual goal of understanding the world. This demands a change in the role of the leader and constant dialogue between all actors. Union is also necessary to achieve liberation and to avoid the pit falls of false logic. Organisation is also a necessary element of radical action. It creates coherence between action and practice. For

effective action to be achieved there must be discipline and order. Precise aims and unambiguous task must be specified. There must accountability of the participants to each other.

THE E4 PROJECT

EDUCATION FOR EMPLOYMENT

Section 3: Learning Styles

Section 3: Learning Styles

What's my motivation?

One of the most engaging questions to challenge educators is why one learner can easily pick up a particular element of a task, skill or concept, while another experiences great difficulty. This section introduces one way of understanding the differences between the ways that individuals learn - the identification of a person's learning styles. By gaining insight into how he or she processes, understands, generates and collates information, both learner and educator can successfully negotiate the most challenging of learning tasks.

All people learn differently; some people learn more differently than others

The most well known and most easily used learning styles model is the Visual, Auditory (Reading/Writing), Kinaesthetic Model (VAK or VARK). The term Kinaesthetic refers to the sense of movement. This Model is presented in some detail. Other models will also be discussed in order to provide a view of the range and depth of information processes that may need to be taken into consideration when investigating how any one individual learns.

Learning styles models incorporate a range of aspects of learning which can influence the way in which a person deals with incoming information and retrieves stored knowledge. There are five broad categories of models:-

- → Channel or Mode of Learning
- → Cognitive Strengths in Learning
- → Personality Type influence on Learning
- → Manner or Style of Learning
- → Types of learning behaviour and strategy

Adapted from: Should we be using learning styles? LSRC

The learning style models examined in this section are:

1 VAK/VARK (Visual Auditory (Reading/Writing) Kinaesthetic) which looks at the channel or mode of learning preferred.

2 Three Representational modes (TRiM) which draws on preferences for channels and cognitive skills.

3 Kolb's Learning Style Inventory which draws on cognitive skills and styles of learning.

4 Myers Briggs Type Indicator which draws on the relationship between personality type and learning style.

5 Multiple Intelligences (Howard Gardiner) which draws on elements of all of the above.

1.1 VAK/VARK Model

This is one of the best-known models and is based on the premise that information received through the most preferred of one, two or three sensory channels (VAK) will be most efficiently retained, understood or applied.

Some models include a fourth channel, the reading and writing channel which is listed separately.

→ Visual
→ Auditory
→ (Reading/Writing)
→ Kinaesthetic

Whilst some people, especially younger learners, those with learning difficulties or certain disabilities, focus very much on one style of learning many of us use two or more. Therefore it is important that the educator or trainer learns to offer information in a way that it can be accessed by individuals favouring each of the learning preferences. As well as allowing each learner to receive information in a manner that is most accessible and best understood, this also offers access to two other channels of learning to reinforce, review or reflect on the material.

There is some debate as to whether reading and writing are visual or auditory skills and some versions of the VAK place the skill of reading in the auditory or visual section and the skill of writing in the kinaesthetic section. As these linguistic skills require a combination of input and output channels it is actually more useful to understand that different elements of linguistic skill can be found in each of the three channels. The development of language itself requires the ability to connect sounds or (in the case of sign language) movements with the understanding of concepts and ideas. Learning to read or write requires us to transfer these sounds to a written (visual and kinaesthetic) format using a series of symbols (the alphabet). The study of signed languages has shown linguists that language can be visual and spatial and is not just auditory.

The learning trends associated with each of the three channels are presented below.

a. **Auditory learners** usually talk to themselves a lot. They also may move their lips and read out loud. They may have difficulty with reading and writing tasks. They often do better talking to a colleague or a tape recorder and hearing what was said.

To integrate the Auditory learning style into the learning environment:

→ Begin new material with a brief explanation of what is coming. Conclude with a summary of what has been covered. This is the old adage of "tell them what they are going to learn, teach them, and tell them what they have learned."

→ Use the Socratic method of lecturing by questioning learners to draw as much information from them as possible and then fill in the gaps with your own expertise.

→ Include auditory activities, such as brainstorming, buzz groups, Jeopardy, etc.

→ Leave plenty of time to debrief activities. This allows them to make connections of what they learned and how it applies to their situation.

→ Have the learners verbalise the questions.

→ Develop an internal dialogue between yourself and the learners.

b. **Visual learners** have two sub-channels - linguistic and spatial. Learners who are visual linguistic like to learn through written language, such as reading and writing tasks. They remember what has been written down, even if they do not read it more than once. They like to write down directions and pay better attention to lectures if they watch them. Learners who are visual spatial

usually have difficulty with written language and do better with charts, demonstrations, videos, and other visual materials. They easily visualise faces and places by using their imagination and seldom get lost in new surroundings.

To integrate the Visual Learning style into the learning environment:

→ Use graphs, charts, illustrations, etc.

→ Include outlines, agendas, handouts, etc. for reading and taking notes on.

→ Include plenty of content in handouts to reread after the learning session.

→ Leave white space in handouts for note taking.

→ Invite questions to help them stay alert in auditory environments.

→ Post flip charts to show what will come and what has been presented.

→ Emphasise key points to cue when to takes notes.

→ Eliminate potential distractions.

→ Supplement textual information with illustrations whenever possible.

→ Have them draw pictures in the margins.

→ Show diagrams and then explain them.

→ Have the learners envision the topic or have them act out the subject matter.

c. **Kinesthetic learners** do best while touching and moving. It also has two sub-channels - kinesthetic (movement) and tactile (touch). These types of learners tend to lose concentration if there is little or no external stimulation or movement. When listening to lectures they may want to take notes. When reading, they like to scan the material first, and then focus in on the details (get the big picture first). They typically use colour highlighters and take notes by drawing pictures, diagrams, or doodling.

To integrate the Kinesthetic Learning style into the learning environment:

→ Use activities that get the learners up and moving.

→ Play music, when appropriate, during activities.

→ Use coloured markers to emphasise key points on flipcharts or white boards.

→ Give frequent stretch breaks (brain breaks).

→ Provide toys such as Koosh balls and Play-Dough to give them something to do with their hands.

→ To highlight a point, provide gum, candy, scents, etc. which provides a cross link of scent (aroma) to the topic at hand (scent can be a powerful cue).

→ Provide highlighters, coloured pens and/or pencils.

→ Guide learners through a visualisation of complex tasks.

→ Have them transfer information from the text to another medium such as a keyboard or a tablet.

http://www.nwlink.com/~donclark/hrd/styles.html
The Chart below is one example of how easy it is to self identify learning style:

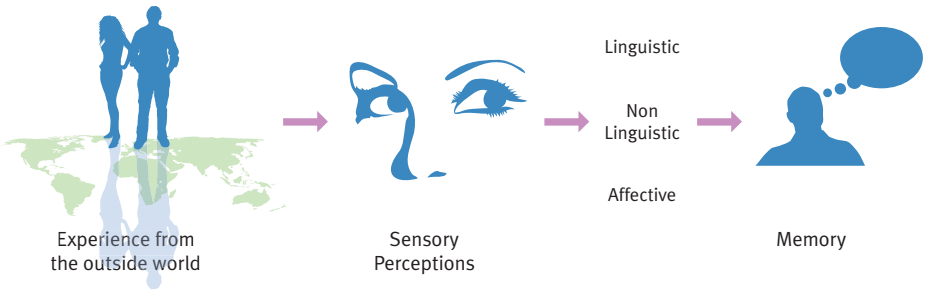
The chart below can help you determine your learning style. Read the word in the left column and then answer the questions in the successive three columns to see how you respond to each situation. Your answers may fall into all three columns, but one column will likely contain the most answers. The dominant column indicates your primary learning style.

When you...	Visual	Auditory	Kinesthetic & Tactile
Spell	Do you try to see the word?	Do you sound out the word or use a phonetic approach?	Do you write the word down to find if it feels right?
Talk	Do you sparingly but dislike listening for too long? Do you favour words such as see, picture, and imagine?	Do you enjoy listening but are impatient to talk? Do you use Do you use words such as hear, tune, and think?	Do you gesture and use expressive movements? Do you use words such as feel, touch, and hold?
Concentrate	Do you become distracted by untidiness or movement?	Do you become distracted by sounds or noises?	Do you become distracted by activity around you?
Meet someone again	Do you forget names but remember faces or remember where you met?	Do you forget faces but remember names or remember what you talked about?	Do you remember best what you did together?
Contact people on business	Do you prefer direct, face-to-face, personal meetings?	Do you prefer the telephone?	Do you talk with them while walking or participating in an activity?
Read	Do you like descriptive scenes or pause to imagine the actions?	Do you enjoy dialog and conversation or hear the characters talk?	Do you prefer action stories or are not a keen reader?
Do something new at work	Do you like to see demonstrations diagrams, slides, or posters?	Do you prefer verbal instructions or talking , about it with someone else?	Do you prefer to jump right in and try it?
Put something together	Do you look at the directions and the picture?		Do you ignore the directions and figure it out as you go along?
Need help with a computer application	Do you seek out pictures or diagrams?	Do you call the help desk, ask a neighbour, or growl at the computer?	Do you keep trying to do it or try it on another computer?

Adapted from Rose(1987). Accelerated Learning.

1.2 Three Representational Modes (TRiM)

The TRiM model also accepts that all perceived information is accessed via sensory channels but that it must also pass through one of three processors in order to be retained in memory. These processors are said to be: linguistic, non-linguistic and affective.



http://www.nwlink.com/~donclark/hrd/styles.html

a. **Linguistic** (verbal communication, reading, learning rules by watching). This mode is highly logical and features the ability to hypothesise (IF/THEN/WHAT).

b. **Non-linguistic** (Mental pictures, smell, kinaesthetic, tactile, auditory, taste). Images can be generated from memory as well as vision but are not as logical or fully formed as linguistic propositions are. This includes the majority of the VAK elements.

c. **Affective** (feelings, emotions and moods). This mode places pain at one end of a spectrum and pleasure at the other, it is natural to strive for the most pleasant end of the spectrum.

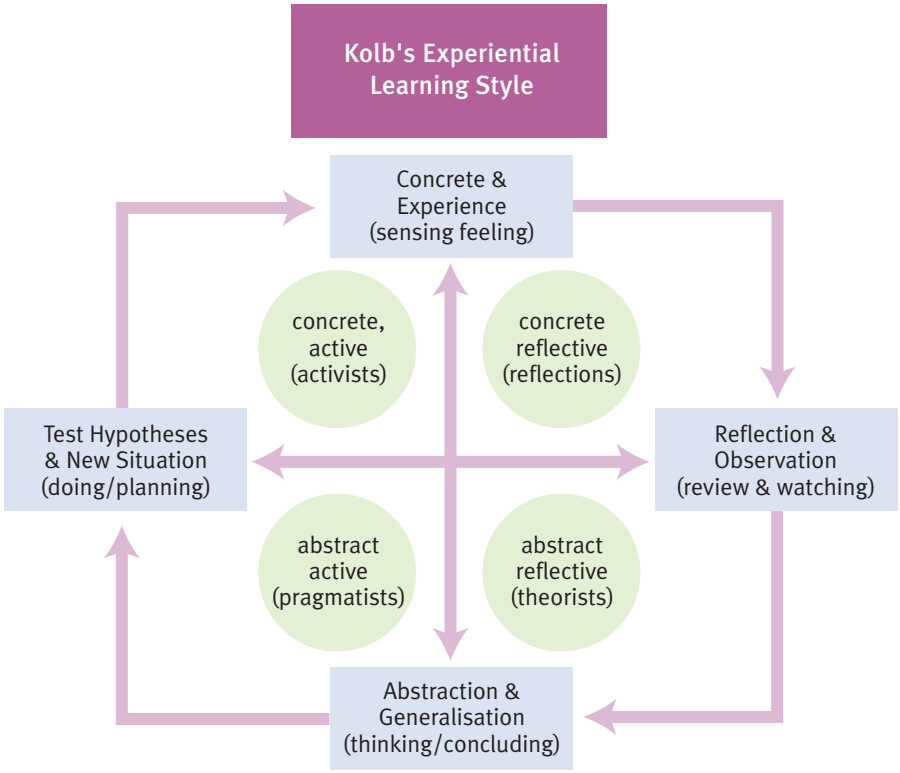
1.3 Kolb's Learning Style Inventory

This inventory is actually two models in one as it contains a description of a four stage learning process: (it can also be viewed as four aspects of a given Task).

- → Watching (introvert-reflection)
- → Thinking (mind)
- → Feeling (emotion)
- → Doing (extrovert-muscle)

The second part of the model describes the four styles of learning used within the process of learning:

- → Reflectors
- → Theorists
- → Pragmatists
- → Activists



http://www.nwlink.com/~donclark/hrd/styles.html

This model confirms the idea that although we can learn from each of the different types of experiences one of them will be favoured.

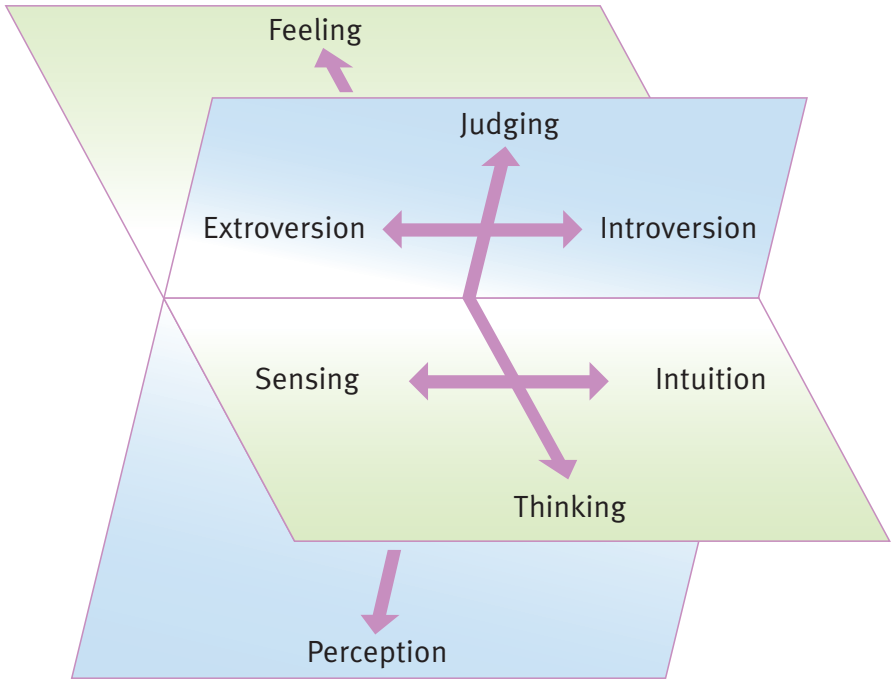
1.4 Myers Briggs Type Indicator (MBTI)

This model is based on the identification of personality type as an aid to how the individual can best learn. It draws on the research of Carl Jung identifying distinct personalities or archetypes.

The MBTI selects four fields of personality and moves between two poles in each field:

- → Extroversion-Introversion
- → Sensing- Intuition
- → Thinking-Feeling
- → Judging-Perspective

The MBTI model can be seen as having an additional dimension as each area potentially interacts with the other three to a greater or lesser degree.



MBTI Model http://www.nwlink.com/~donclark/hrd/styles.html

1.5 Multiple Intelligences

Howard Gardiner moved out of a narrow view of intelligence when he hypothesised that there were a number of different types of intelligence even though it was mostly assumed that linguistic (verbal) and logical (mathematical) skills were the best indicators of intelligence. He proposes that there are at least eight other types of intelligence and that we all use one or two or more of these when we learn.

Verbal-Linguistic	Hearing, listening, speaking, humour, creative writing, poetry
Logical-Mathematical	Reasoning, pattern detection as scientist, symbolic abstraction, formulas, number sequences, calculation, problem solving
Musical	Audio-tape, recitals, singing, vibrations, rhythm
Spatial	Art, pictures, sculpture, drawing, doodling, mind maps, pattern, colour, imagination
Bodily-Kinaesthetic	Role play, dextrous, agile, role play, drama, sport, dancing, body language
Interpersonal	Sociable, group projects, teamwork, collaborating, giving and receiving feedback, understanding people's motives
Intrapersonal	Emotionally aware of self, reflective, silent reflection, thinking strategies, concentration skills, high-order reasoning
Naturalistic	Biological interest, charting, observing change, journal and log keeping, phenomenon aware

1.6 Which is the best model to use?

There is no such thing as the best model to use. It can be seen that there is a variety of approaches to identify the best ways that individuals learn. Some methods are complex and some are simple. Within this handbook the complexity of the study of cognitive science has been mentioned, and, as this is a study, which will take some time to uncover the nine-tenths of its iceberg of knowledge still remaining underwater, it is fair to say that none of the models described will fully answer the question.

However, this type of exploration does provide both the learner and educator with a few useful facts to bear in mind as ultimately it is up to each individual educator to take responsibility for the range of abilities and skills of the individuals in any given group and to build his or her resources and teaching styles to a point where he or she is teaching across the entire range of learning styles. In this way it is useful for all learners to build profiles of their own learning behaviours and to add to these over time as their learning skills mature in order that they can gain optimal results from their academic efforts.

We all learn differently	This is the norm not the exception; in a group there will be diversity
We all teach differently	It is not useful to spend time identifying ways that individuals learn best if we don't include (and modify) the type of teaching delivery used in the equation
Assessment can be unfair	We are often examining learners' ability with a particular skill such as writing or talking rather than on his or her knowledge of the subject under study

THE E4 PROJECT

EDUCATION FOR EMPLOYMENT

Section 4. Teaching and Learning Strategies

Section 4. Teaching and Learning Strategies

Don't try this at home

Go into one of the classes you are teaching and have your students take out a sheet of paper. Ask them to list for you the qualities they feel are important in a good teacher. Ask them to identify the qualities they admire in the best teachers they have had. Then give the students enough time to think about it and write something down. Five minutes is good, but ten might be better. Let them answer the questions anonymously if they desire.

What's my motivation?

John Dewey was the most famous proponent of experiential learning, perhaps paving the course for all future activities in his seminal book Experience and Education, first published in 1938. Dewey's fame during that period rested on relentlessly critiquing public education and pointing out that the authoritarian, strict, pre-ordained knowledge approach of modern traditional education was too concerned with delivering knowledge, and not enough with understanding students' actual experiences.

1. Introduction

In education, teachers facilitate student learning. The objective is typically a course of study, lesson plan, or a practical skill, including learning and thinking skills. The different ways to teach are often referred to as the teacher's pedagogy. When deciding what teaching method to use, a teacher will need to consider students' background knowledge, environment, and their learning goals as well as standardised curricula as determined by the relevant authority.

It is a common misconception at the tertiary level that knowledge of a subject is all that's required to be a good teacher; that the students should be willing and able to extract the meat from what you say regardless of how it is delivered. This might be true at the upper graduate level, but elsewhere it is definitely untrue, it is especially untrue at the undergraduate level. A good teacher/lecturer allows students to understand the material, and to understand what it means. This can be achieved by finding innovative and creative ways to make complicated ideas understandable to their students, and to fit new ideas into the context available to the student. There is a saying, "Give me a fish and I eat for a day, teach me to fish and I eat for a lifetime." This is the philosophy of a good teacher. Give your students an answer and they can solve one problem, but show students the techniques needed to find the answer for themselves and they can become self-sufficient in the field. In the following sections a range of techniques will be discussed to help students become their own teachers.

2. Experiential Learning

Each of the methodologies outlined in this sub-section relies on experiential learning to provide context and frameworks for learning through action.

Outdoor education happens through organised learning activities occurring in the outdoors, utilising environmental experiences as a learning tool. Service learning is the combination of community service with stated learning goals, relying on experience as the foundation to provide meaning in service. Cooperative learning alters heterogeneous grouping in order to support diverse learning styles and needs within a group. Active learning, places the responsibility of learning on learners themselves, requiring their experience in education to inform their process of learning. Environmental education are efforts to educate learners about relationships within the natural environment and how those relationships are interdependent. The experience of being outdoors and learning through doing makes this learning relevant to students.

Experiential learning serves as an umbrella for linking these diverse practices in a coherent whole. Similarly, experiential learning is also closely linked to a number of other educational theories, including progressive education, critical pedagogy, youth empowerment, feminist-based education, and constructivism. The development of experiential learning as a philosophy is intertwined with the development of these other educational theories and have helped articulate and clarify elements of this philosophy.

The key idea in experiential learning involves engaging students in active roles for the purpose of learning. Students participate in a real activity with real consequences for the purpose of meeting learning objectives.

Some experts in the field make the distinction between 'democratic experiential learning' in which students help design curricula and run their own projects and even do their own grading (through objective contracted standards) and other forms of 'experiential learning' that put students in existing organisations in inferior roles (such as service learning and internships) or in which faculty design the field work.

Experiential learning uses various tools like games, simulations, roleplays and stories in classrooms. The experiential learning mindset changes the way teachers and students view knowledge. Knowledge is no longer just some letters on a page. It becomes active, something that is transacted with in life or life-like situations. It starts to make teachers experience providers, and not just transmitters of the written word. Students become knowledge creators (for themselves) as well as knowledge gatherers.

Besides changing student roles, experiential learning requires a change in the role of teachers. When students are active learners, their endeavours often take them outside the classroom walls. Because action precedes attempts to synthesise knowledge, teachers generally cannot plan a curriculum unit as a neat, predictable package. Teachers become active learners, too, experimenting together with their students, reflecting upon the learning activities they have designed, and responding to their students' reactions to the activities.

2.1 Inquiry Based Learning

The philosophy of inquiry based learning finds its antecedents in the work of Piaget, Perkins, Dewey and Freire among many others. Dewey's theory of learning is that optimal learning and human development and growth occur when people are confronted with substantive, real problems to solve. He believed that curriculum and instruction should be based on integrated, community-based tasks and activities that engage learners in forms of pragmatic social action that have real value in the world. The focus on the teacher as expert is central to Vygotsky's learning theory. He proposed that

cognitive development is the product of social and cultural interaction around the development and use of tools of a cognitive, linguistic and physical nature. Learning occurs in a zone of proximal development where authoritative tool users – teachers acting as mentors – initiate and lead students as novices into the use of technologies. This structured introduction into using tools is called 'scaffolding'. Work should be structured around projects that demand students engage in the solution of a particular community-based, education -based or regional problem of significance and relevance to their worlds.

Freire's work is premised on the assumption that the most authentic and powerful pedagogy is one that focuses on the identification, analysis and resolution of immediate problems in learners' worlds. Hence, his approach is referred to as a problem-posing and problem solving pedagogy. Freire argues that any pedagogy must be of demonstrable relevance to the immediate worlds of the students and it must enable them to analyse, theorise and intellectually engage with those worlds.

2.2 Problem-based learning

Problem-based learning (PBL) is a pedagogical strategy of "active learning" often used in higher education. The defining characteristics of PBL are:

→ Learning is driven by challenging, open-ended problems.
→ Students work in small collaborative groups.
→ Teachers take on the role as "facilitators" of learning.

Accordingly, students are encouraged to take responsibility for their group and organise and direct the learning process with support from a tutor or instructor. Advocates of PBL claim it can be used to enhance content knowledge and foster the development of communication, problem-solving, and self-directed learning skill.

PBL is typically done in small discussion groups of students accompanied by a tutor or facilitator. A realistic problem is presented that often has incomplete information. In some implementations of PBL, students must engage in inquiry to get information about the problem; in others, the information is presented sequentially. The students discuss the problems, define what they know, generate hypotheses, derive learning goals and organise further work (such as literature and database research). Results are presented and discussed in the following session. The students then apply the results of their self-directed learning to solve the problem. A PBL cycle concludes with reflections on learning, problem solving, and collaboration.

Although some predefined aspects of the problem are usually expected to be investigated, not all learning goals are strictly defined in advance. Problems should be ill-structured and should ideally be open to differing approaches and offer thematic sidelines.

The teacher's role, as facilitator, is to guide the learning process rather than provide knowledge (Hmelo-Silver & Barrows, 2006). They facilitate the learning process by asking open-ended questions, largely metacognitive. Feedback and reflection on the learning process and group dynamics are essential components of PBL.

2.3 Project-based learning

Project-based learning, (or "PjBL" to avoid confusion with "Problem-based Learning"), is a constructivist pedagogy that intends to bring about deep learning by allowing learners to use an inquiry based approach to engage with issues and questions that are rich, real and relevant to their lives.

PjBL is an approach for classroom activity that emphasises learning activities that are long-term, interdisciplinary and student-centered. This approach is generally less structured than traditional, teacher-led classroom activities; in a project-based class, students often must organise their own work and manage their own time. Within the project based learning framework students collaborate, working together to make sense of what is going on. Project-based instruction differs from inquiry-based activity by its emphasis on collaborative learning. Additionally, project-based instruction differs from traditional inquiry by its emphasis on students' own artifact construction to represent what is being learned.

Elements of a good project based learning experience include:

→ A fertile question or issue that is rich, real and relevant to the students lives

→ Real world use of technology

→ Student-directed learning and/or the deliberate engagement of student voice

→ Collaboration

→ Multi-disciplinary components

→ Long term (more than 3 weeks) time frame

→ Outcomes-based, with an artifact, presentation, or action as a result of the inquiry

When used with 21st century skills, Project based learning is more than just a web-quest or internet research task. Within this type of project, students are expected to use technology in meaningful ways to help them investigate or present their learning. Where technology is infused throughout the project, a more appropriate term for the ºpedagogy can be referred to as iPBL (copyright 2006, ITJAB), to reflect the emphasis of technological skills and academic content.

The aim is for real-life context and technology to meet and achieve outcomes in the curriculum through an inquiry based approach. A PBL approach is designed to encourage students to become independent workers, critical thinkers, and lifelong learners.

PBL relies on learning groups; student groups determine their projects, in so doing, engaging student voice by encouraging students to take full responsibility for their learning. This is what makes PBL constructivist.

3. Problem Posing

What's my motivation?

Problem posing lies at the heart of the survey method developed by Paulo Friere while working in adult literacy programmes in Brazil. It is a systematic approach to empowering adult learners to take control of their own learning. This section describes the practical steps that adult educators can take to facilitate emancipatory learning particularly for adults who have experienced failure in formal education.

To problematise a term, a text, an opinion, or personal perspective is to construct them as challenges that encourage learners to attempt to transform their circumstances or views (Crotty 1998). Problematisation is based on a dialogue or process that takes the common knowledge about a situation which is taken for granted and transforms that knowledge into a problem. This allows the learners to adopt new points of view, to reflect and to move towards action to emerge.

Central to the method is that it should lead to planning and action which changes the learners' context and circumstances. Rather than staying with the accepted 'wisdom' about what is going on the learner evolves an alternative viewpoint on the issue.

One way to problematise a statement is to get the learner to ask some simple statements about it. For example with regard to the statement: 'The civil war in Iraq is escalating.' It is possible to ask who is making this statement or on whose behalf is it being made. Other interesting questions include why is the statement being made and why now. Finally, who gets to benefit from the statement and who is harmed? This approach helps learners question and challenge their beliefs and achieve critical consciousness.

The educator works to lead students to question ideologies and practices that they consider repressive and encourages collective and individual responses to the actual conditions of their own lives. The group is at the centre of the process and involves gaining insight into how society is constructed, sharing knowledge and taking actions to change the nature of the society.

3.1 Steps in Problem posing

These key principles can be worked out practically in a variety of ways. The following describes how they can be applied in preparing an integrated adult education program.
Many educators and development workers have wrestled with the problem of apathy and fatalism in the groups they wished to reach. This method has been developed in the course of a serious attempt to understand and overcome the root causes of these problems both in rural and 'poor' urban communities. It therefore starts with a survey of issues of concern to the learning group.

1 **Survey (developing a program on issues of the community)**
As the survey is one of the most important parts of the whole process, it is important that it be done in a perceptive and sensitive way. The survey is not approached like traditional surveys in which research workers decide beforehand which facts they are going to find out about and work from very precise questionnaires, etc. In this approach the educator listens primarily to unstructured conversations, in which the people feel relaxed and talk about the things that they are most concerned about. It can be called a listening survey.

The listening situation should be places where the team members themselves will feel unself-conscious. Where possible it is good to let the people know that the team is preparing materials for a particular program and get their full and conscious co-operations. Places like markets, buses, washing areas, bars etc. can be places where a team can listen easily.

2 **Analysis of survey material**

The next step is to take the information from the survey and assist the group to look at it critically. What are people speaking about with strong feelings? Are the issues mainly dealing with problems of subsistence, decision-making or values? Where will action most likely come from? What will most effectively motivate people?

3 **Preparing of problem-posing materials.**

The educator then prepares a series of problem-posing materials to stimulate discussion in the learning group. The materials can be pictures, posters, slides, short stories, mimes, plays or songs. They should present a scene showing a concrete experience of one of the themes chosen, in such a way that it would be familiar to many of the participants.

Through the use of contrasts, relating cause and effect, tension points, etc. the materials should raise questions in the minds of the participants, and stimulate them to think of different possibilities. The better the materials the more learners will discover for themselves, and the less the educator will have to 'tell' them the answers.

The success of this approach depends on:

a. whether the themes chosen really are important preoccupations for the members of the learning group and the wider community, and

b. whether the materials really do raise questions about familiar situations in the participants own lives.

4 **The learning group.**

The creation of a good learning situation, taking account the psychological needs of the adult learner, is vital. Each person should have an opportunity to take an active part in the discussion. Critical awareness means that people must be allowed to speak their own words. Speaking for other people or making them speak your words, does not promote critical thinking.

It is often very threatening to accept new ideas and one's first reaction is to resist them. People need to be allowed to express this resistance, as this often makes them freer to accept the ideas later. Mistakes should not be mocked but expected and used as the basis for further learning. Developing this atmosphere of learning takes new skills on the part of the adult educator.

5 **The role of the animator.**

The adult educator's main work is to help the participants to 'unveil' their situation. They will remember much better what they have said and discovered for themselves, than what the 'teacher' has told them. Therefore the adult educator should not talk much, but should encourage discussion in the group through asking the right questions. No one is ever completely ignorant and no one ever has all the answers.

The adult educator needs to summarise when necessary and build on the contributions of the participants. Once they have investigated the problems as deeply as they are able and learnt all they can from one another, the animator has a very important role to play in setting a good learning climate.

This needs group leadership skills and a sensitivity to the dynamics in the group. The adult educator needs to be able to draw in shy people and prevent talkative participants from dominating.

6 **The direction of the discussion**

Once the group has settled down and a friendly learning atmosphere has developed, the adult educator presents the problem posing materials (picture, story, play etc) to the group. Six basic steps form the framework for the discussion:

- → description
- → first analysis
- → related to real life
- → deeper analysis
- → self-reliant action planning.

The whole process develops in the group a critical awareness of their own situation and stimulates the search for solutions to their own problems. This is the basis of 'conscientisation'.

7 **Reflection – Action**

Whenever a group is able to suggest something concrete that they can do about one of its problems, the adult educator encourages the participants to take action. The educator takes as active role as possible in it and helps the group to evaluate it together afterwards. All sorts of projects can arise out of this approach to adult education including day care groups and local enterprise centres but the projects are not ends in themselves. They are the beginning of the process for critical awareness. It is also not always necessary that the problem posing process results in such substantive outcomes. The important thing is that the process leads to empowered learning on the part of the learners.

4. Service-Learning

What's my motivation?

Service-learning is an exciting new development in education, primarily at third level but also at earlier levels. Quite popular now for some time in the United States, service-learning is an active approach to education which provides students with exposure to the world outside the campus walls throughout their learning experience, by presenting them not just with real world problems, but with real world clients with whom they must work

Students typically work with voluntary or non-profit organisations, which have requirements for some project, but lack either the funding or the expertise to carry out the project alone. The benefits of this approach to the student are obvious. The level of responsibility given to the student and the scope within which they are permitted to operate are typically much greater in these less formal, non-commercial situations. The benefits to the community are also clear, as non-profit and voluntary organisations are given the services of people who are at a pre-professional and consequently inexpensive stage. Ultimately the goal of service learning is to stimulate involvement in the voluntary sector in the long term by producing cohorts of graduates who have had exposure to and experience of working with community based, non-profit and voluntary organisations. As such, these programmes are receiving backing from both local and central government, in Ireland and elsewhere.

Some of the important advantages of this type of learning, as presented in the published literature on service-learning, include:

→ Students would be honing and developing the skills needed for their future careers.

→ Students synthesise the subject matter through a broader range of experiences

→ Students critically reflect on their values and responsibilities as citizens

→ Students gain a belief that through their actions they can make a difference

→ Teachers are able to use stimulating examples of real-world problems

→ It instills a sense of social, professional and ethical responsibilities in both students and teachers

Importantly for educators in sectors, which serve industry, service-learning can remove the requirement for, or at the very least reduce the reliance upon, simulated client interaction and trivial problems in the classroom. As such, it aligns with the requirement identified by professional bodies to provide students with applied project experience. It also has strong benefits in terms of developing some of the key transferable skills of undergraduates, thus satisfying the learning outcomes of the majority of education programmes.

Above all else, as an active-learning approach to education, service-learning benefits the student best by providing them with meaningful, long lasting and effective learning experiences. All other goals of service-learning are secondary – but it is the impact that this form of learning has on the secondary goals, both social and professional – that makes this approach to education both popular and extremely valuable.

4.1 Case Study: Dublin Institute of Technology, Kevin Street

For three years, students in Year 2 Web Development in the BSc in Computer Science participated in a Service Learning project in co-operation with DISC and a set of inner city schools, in order to facilitate the development of a web presence for each of these schools. Several local businesses and government agencies involved in other related projects had funded the installation of expensive hardware and software in these schools, as well as training of teachers, parents and pupils.

Project Description

The project used the format of the service learning projects and Web Development lifecycle model employed by Jonathan Lazar at Towson University in Maryland, USA as a starting point. The lifecycle model used is effectively a slightly modified version of the standard Systems Development Life Cycle (SDLC) model, incorporating six stages. Given the time constraints on the students, and the workload from other modules, a boundary was established from the beginning whereby the students would be required to design, implement and test the site offline, but would not be required to upload the website or maintain it after development. The set of all deliverables to be supplied throughout the project, over the period from November to April included *Project Proposal, Plan for Collecting Requirements, Preliminary Design Plan, Full Design Plan, Usability Test Plan and finally the Site and Documentation*.

Altogether, over the period of three years, 109 students were involved in the development of web sites for 25 different schools. The students were arranged into groups ranging in size from 2 members to 7 members. In the first year there were 30 students and 6 schools. In the second year there were 58 students and 9 schools. In the third year the project was restricted to 20 students, working in pairs on sites for 10 schools.

Communication between the groups and their client (a designated representative in each school), took place via e-mail (where possible), postal mail and person-to-person meetings. Communication with users (teachers, pupils, parents) took place through survey submissions, written feedback and person-to-person meetings.

Team Responsibilities

Before the beginning of the project, each group was given instruction on the ground rules for interacting with their client and the potential users. Issues such as professional conduct, time-keeping, deadlines and overall behaviour were stressed. Teams were also given advice and instruction on how to conduct team work in terms of regular meetings, assignment of roles, distribution of work effort and documentation of meetings and work carried out. Elsewhere, modules on communication, ethics and professional conduct are delivered independently of the real world context, but it is often considered more successful to ground these important aspects of a student's education with a realistic scenario. Such preparation is obviously necessary for the success of the project in terms of the relationship within the team and with the client, but also and more importantly for the students the final assessment would be partially based on such factors. Such preparation, accompanied by reflection throughout the project are key components of Service Learning.

At each stage of the project, the group was required to make decisions on a variety of issues, ranging from how to determine the mission and audience(s) for the site, how to collect requirements, what to include in the site, how to organise and present the site, what software and hardware technologies to use in developing the site, how to provide for usability and accessibility, how to test the site and how to collect and incorporate feedback. Feedback was sought from the client and users after each stage was completed. Instruction was given in class on each of these issues, but the issues were only presented to and discussed with the students, no definitive answers were given to them. It was constantly stressed that decisions must be based on the needs of both client and user, which may

vary significantly from one project to another. Such an approach to teaching scaffolds the student's learning allowing them to construct their own model of learning, rather than providing them with checklist style memory banks of knowledge. This should assist in developing the type of flexibility and approach to learning required not only for the remainder of their formal education, but also their ability to adapt and learn in the workplace.

Assessment of Project

The project was assessed based on each of the deliverables. All members of the teams were required to sign each document that was submitted although members were not required to identify their individual contributions, as is typically the case in real world settings. It was generally found that over the three years, team members who did not contribute were not permitted to sign the documentation by the other team members. However, the vast majority of problems that happened internally within teams were resolved locally, without intervention.

Feedback from clients was positive but was not used for assessment. We felt that clients were perhaps reluctant to criticise or give negative comments since this work was not being paid for and was being carried out by non-professionals. This is a key distinction to be made between industrial placement and Service Learning.

Conclusions

Over the course of three years, a total of 109 students worked in groups to develop web sites for a 25 primary and secondary schools in Dublin's inner city. The sites varied dramatically in terms of the audiences that they were designed to serve, including pupils, parents, teachers, local residents, businesses and visitors to Dublin. The sites were developed using a range of different technologies including HTML, JavaScript, CSS, Flash, Java Applets, XML and XSL-T, all chosen by the site developers (the student groups) to suit the requirements of their clients and the end users of the completed product. In a small number of cases the students were required to redesign an existing site but in most cases the entire site was designed and implemented from scratch.

Feedback received from school representatives was very positive, reflecting the excellent conduct and professionalism of the students participating in the project. In many cases, the schools had never previously presented themselves to the world via the web, and consequently showed a great deal of enthusiasm for the project. This meant that the students often had to deal with clients who required progress reports and meetings to discuss alterations to earlier designs.

Student feedback was equally positive. It was clear as the project progressed that the students were developing the maturity necessary to interact with professionals outside of the college campus. Prior to attending meetings with their clients, the students regularly met with each-other to assign roles for the meeting and brainstorm potential problems and issues they would have to deal with. In all cases our students were able to appreciate the importance of non-technical skills, as they were forced to explain decisions relating to the design of their product to people with vague requirements and little technical understanding.

5. Active Learning

What's my motivation?

Active learning is an umbrella term that refers to several models of instruction that focus the responsibility of learning on learners. It has been suggested that students who actively engage with the material, are more likely to recall information later, and be able to use that information in different contexts. Discovery learning, Experiential learning, Problem-based learning, and Inquiry-based instruction are the most often cited forms of active learning. Adopting active learning does not mean following highly structured methods, like the ones mentioned above, or even completely eliminating the lecture format. Activities that encourage student involvement may be incorporated into a lesson plan. But this should only be done once basic instruction has been accomplished.

Active learning involves providing opportunities for students to meaningfully talk and listen, write, read, and reflect on the content, ideas, issues, and concerns of an academic subject. The classic model for the classroom generally takes the form of the teacher doing most of the talking and the student playing a passive role. This will result in the students with role learning skills and good short-term memories getting the higher grades. This approach never gives the majority of students the opportunity to apply course material to real life situations or to ask meaningful questions and form a solid understanding. However, research shows that engaging students in an active way results in heightened learning experiences, more enjoyable classes and an overall empowerment of the student. If a teacher could shift the focus of his/her *delivery* of course material to the *engagement* of students with the course material, then that teacher would be promoting active learning (move from being a "sage on the stage" to becoming a "guide on the side"). The goal of the teacher should be to facilitate learning; Active learning techniques allow the teacher to achieve that goal.

5.1 Fact Rounding

The Fact rounding technique works as follows, towards the end of a lesson the students are asked to recall one fact from the material covered. Another student should not repeat a fact already

mentioned and the activity should continue until all the lesson material has been covered. This technique can be used for several reasons. The first reason may be to see if the teacher has covered all the material as set in the learning outcomes for that particular class. If one or more of the learning outcomes are not mentioned by the students this will then be highlighted to the teacher. The second reason may be so that students effectively summarise their own learning during a class. Taking an active role like this can help students engage with the material covered in the lesson and will result in a heightened learning experience. Thirdly, as the activity continues around the classroom it takes a deeper cognitive ability to come up with a fact not already mentioned by another student. Hence, the students are developing skills that will help them in answering questions that require an application and analysis of the material to come up with new answers.

5.2 Phasing

The activity of Phasing starts off with three groups in its first Phase. These groups will each be assigned a particular section of a larger problem. All groups are then given a specific amount of time to work on either fact finding or a solution or both. The time frame most suitable for Phasing is two hours but the approach taken can vary depending on the needs of the particular problem. After a given period of time the group elect a leader to present their findings. From this short presentation the students will learn about the different sections of the larger problem.

Phase 2 begins with the original groups being split in two halves and those halves coming to form two new groups. This formation ensures that all students get exposure to all areas of the larger problem. The two new groups will have a new solution or facts to find. Phase 2 develops in the same way as Phase 1 and the elected leader of each group present the findings.

Phase 3 takes the form of a group discussion bringing the findings of Phase 2 together to form the solution to the larger problem. This discussion should be lead by the teacher to ensure the student's findings are correct and to give suggested improvements.

The approach to Phasing can be a varied one, but starting out with more than three groups is not advisable. Also, spreading the Phasing over more than two hours can become laboured and students may lack the concentration levels for the activity to produce a learning experience. Phasing promotes teamwork and will give some students the opportunity to learn presentation skills.

5.3 Active Writing

The Active Writing technique is used as follows; at the end of the lesson students are asked to submit questions based on the material covered. These questions are used as an introduction to the next lesson. The purpose of this activity is to ensure that the students will have their questions answered and to reflect on the material. This activity is different to the other because it is spreads across two separate lessons. This promotes a structured approach to the material being learned. As students think in writing, they clarify the material for themselves and begin to form a deeper understanding of the material. This technique can also be used to gauge students' understanding of a subject based on the questions they submit.

5.4 Team quizzes

The team quizzes activity divides the class into two groups (Group A and Group B). The groups are given an amount of time to generate questions on the material covered. The teacher aims Group A's questions to Group B and visa versa. If the group give the correct answer a point is awarded, otherwise the other group must give the answer. The purpose of this approach is to promote the generation of well thought out questions and answers.

Experiential learning is a process for learning through action. The term is often used interchangeably with experiential education. The Association for Experiential Education regards Experiential learning "as a philosophy and methodology in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values."

6. Collaborative Learning

Collaborative learning is an umbrella term for a variety of approaches in education that involve joint intellectual effort by students or students and teachers. Collaborative learning refers to methodologies and environments in which learners engage in a common task in which each individual depends on and is accountable to each other. Groups of students work together in searching for understanding, meaning or solutions or in creating an artifact of their learning such as a product. The approach is closely related to cooperative learning. Collaborative learning activities can include collaborative writing, group projects, and other activities. Collaborative learning has taken on many forms. One form is Collaborative Networked Learning for the self-directed adult learner. Youth directed collaboration, another form of self-directed organising and learning, relies on a novel, more radical concept of youth voice.

Computer-supported collaborative learning (CSCL) has emerged as a new educational paradigm among researchers and practitioners in several fields, including cognitive sciences, sociology, computer engineering. It thus constitutes a new trans-disciplinary field.

Collaborative Learning also has a particular meaning in the context of Learning Management Systems. In this context, collaborative learning refers to a collection of tools which learners can use to assist, or be assisted by others. Such tools include Virtual Classrooms (i.e. geographically distributed classrooms linked by audio-visual network connections), chat, discussion threads, application sharing (e.g. a colleague projects an MS Excel spreadsheet on another colleague's screen across a network link for the purpose of collaboration), among many others.

6.1 Co-teaching

Co-teaching has been defined as the collaboration between teachers for all of the teaching responsibilities of all students assigned to a classroom. In a co-taught classroom, two teachers work together to develop a differentiated curriculum that meets the needs of a diverse population of students. In a co-taught classroom, teachers share the planning, presentation, evaluation, and classroom management in an effort to enhance the learning environment for all students. In this way, the teachers can provide more integrated services for all students, regardless of learning needs. Teachers involved in collaborative partnerships often report increased feelings of worth, renewal, partnership, and creativity.

Teachers working in co-teaching classrooms move through a developmental process from polite, and at times, fumbling interactions to truly collaborative relationships. As in any developmental process, teachers proceed through predictable stages in the co-teaching relationship. Knowledge of the developmental stages of co-teaching may diminish the frustration and expedite the movement toward a collaborative partnership.

6.2 Peer Supported Learning

Peer supported learning involves using those around you to gain a wider understanding of tasks that you may have been set or topics that are introduced while you are studying. The idea that 'two, three, or more, heads are better than one' can work well when researching for assignments and coursework.

Using your peers as a resource can be useful in many different situations. It is possible to learn from others in many different situations including:

- → Tutorials/Seminars
- → Web–based discussion forums
- → Email groups
- → In-class discussions/debates
- → Working as a group on an assignment
- → Meeting up for a chat over coffee
- → Organising and giving a presentation where your peers give feedback.

References

Baltes, P. B. (1987). *Theoretical propositions of life-span developmental Psychology: On the dynamic between growth and decline*. Developmental Psychology, 23-61 1-626.

Bronfenbrenner, U. (1979). *The Ecology of Human Development: Experiments by Nature and Design*. Cambridge, MA: Harvard University Press.
ISBN 0-674-22457-4

Burke, M.D., Hagan, S.L., & Grossen, B. (1998). *What curricular designs and strategies accommodate diverse learners? Teaching Exceptional Children*, 31(1), 34-38.

Center for Universal Design (1997). *What is universal design*?
Center for Universal Design, North Carolina State University.
Retrieved December, 2002, from the World Wide Web: http://www.design.ncsu.edu:8120/cud/univ_design/princ_overview.htm

Dolan, R. P. and T. E. Hall (2001). *Universal Design for Learning: Implications for Large-Scale Assessment*. IDA Perspectives 27(4) 22-25.

Hitchcock, C. Meyer, A., Rose, D, and Jackson, R. (2002). *Providing Access to the General Education Curriculum. Universal Design for Learning*. Teaching Exceptional Children Nov/Dec.

Nolet, V. & McLaughlin, M. J. (2000) *Accessing the General Curriculum*.
Thousand Oaks California: Corwin Press.

Meyer, A. & Rose, D. (2000). *Universal design for individual differences*.
Educational Leadership 58(3) 39-43.

O'Neill, L.M. & Dalton, B. (2002). *Thinking readers part II: Supporting beginning reading in children with cognitive disabilities*. Exceptional Parent, 32 (6), 40-43.

Orkwis, R., & McLane, K. (1998). *A Curriculum Every Student Can Use: Design Principles For Student Access*.
Reston, VA: Council for Exceptional Children.
Retrieved November 5, 2002 from: http://www.cec.sped.org/osep/udesign.html

Pisha, B., & Coyne, P. (2001, November). *Jumping off the Page: Content Area Curriculum for the Internet Age*.
Reading Online, 5(4).
Retrieved November 25, 2002 from: http://www.readingonline.org/articles/pisha/

Santrock, J.W., 2002, *Life-Span Development*, McGraw-Hill

Thompson, S.J., Johnstone, C.J., & Thurlow, M.L. (2002). *Universal design applied to large-scale assessments* (NCEO Synthesis Report 44).
Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.

References

Teaching and Learning on the World Wide Web
http://www.scu.edu.au/ausweb95/papers/education2/alexander/

Learning to Learn
http://www.cs.cmu.edu/afs/cs/usr/caruana/pub/transfer.html

Cognitive Modoels for structuring hypermedia
http://www.scu.edu.au/ausweb95/papers/hypertext/eklund/index.html

Center for LifeLong Learning & Design, University of Colorado at Boulder
http://www.cs.colorado.edu/~l3d

Lifelong Learning from the National Information Infrastructure
http://iitfcat.nist.gov:94/doc/Education.html

Institute for Research on Learning
http://www.irl.org/

Interactive World Wide Web Courseware
http://www.scu.edu.au/ausweb95/papers/education1/martin/

Teaching and Learning with Technology
http://www.mcli.dist.maricopa.edu/tech.html

The WWW - Opportunities for an Integrated Approach to Teaching and Research
http://www.scu.edu.au/ausweb95/papers/education1/riddle/

Global Schoolhouse for Life-Long Learning
http://gsn.org/gsn/gsn.projects.html

Lifelong Learning Home Page
http://www.intersource.com/~lifelong/

Education and Lifelong Learning
http://www.hpcc.gov/blue95/section.3.2.html

Reference for Section 3:

Should we be using learning styles? What research has to say to practice
F Coffield, D Moseley, E Hall, K Ecclestone - Learning and Skills Research Centre, London, 2004

http://www.nwlink.com/~donclark/hrd/styles.html

Accelerated Learning, revised edn
C Rose - New York: Bantam Doubleday Dell Publishing, 1987

References

R.M. Felder,(1996) "*Matters of Style*." ASEE Prism, 6(4), 18-23 (December 1996).

Gardner, Howard. 1993. *Frames of Mind: The Theory of Multiple Intelligences* (10th Anniversary Edition). NY: Basic Books.

Jung, Carl (1921) *Psychological Types*. (ISBN 0691097704).

Kolb, D. A. (1984). *Experiential Learning: Experience as the source of learning and development*. New Jersey: Prentice Hall, Return.

Lawrence, G (1993) *People Types and Tiger Stripes: A Practical Guide to Learning Styles*.

McCarthy, B (`1990) *The 4MAT System* (see: www.ncela.gwu.edu/pubs/pigs/pig2.htm).

Rose, Colin (1987) *Accelerated Learning for the 21st Century: The Six-Step Plan to Unlock Your Master-Mind*.

Gent, van, Bastian (21996): '*Andragogy'. In*: A. C. Tuijnman (ed.): *International Encyclopedia of Adult Education and Training*. Oxford: Pergamon, p. 114-117.

Cooper, Mary K. & Henschke, John A. (2003): *An Update on Andragogy: The International Foundation for Its Research, Theory and Practice* (Paper presented at the CPAE Conference, Detroit, Michigan, November, 2003).

Henschke, John (2003): *Andragogy*
Website http://www.umsl.edu/~henschke.

Jarvis, Peter (1987): *Towards a discipline of adult education?*, in P. Jarvis (ed): Twentieth Century Thinkers in Adult Education. London: Routledge, p. 301-313.

Kapp, Alexander (1833): *Platon's Erziehungslehre, als Paedagogik für die Einzelnen und als Staatspaedagogik. Minden und Leipzig: Ferdinand Essmann*.

Knowles, Malcolm S. (21978): *The Adult Learner: A Neglected Species*. Houston: Gulf Publishing Company.

Knowles, Malcolm S. (1989): *The Making of an Adult Educator*. San Francisco: Jossey-Bass.

Krajinc, Anna (1989): Andragogy. In C. J. Titmus (ed.): *Lifelong Education for Adults: An International Handbook*. Oxford: Pergamon, p. 19-21.

Lindeman, Edward C. (1926). *Andragogik: The Method of Teaching Adults*. Workers' Education, 4: 38.

Merriam, Sharan H. and Caffarella Rosemary S. (21999): *Learning in Adulthood*. San Francisco: Jossey-Bass.

Pratt, Daniel D., & Associates (1998): *Five perspectives on teaching in adult and higher education*. Malabar, FL: Krieger.

Reischmann, Jost (2003): *Why Andragogy?* Bamberg University, Germany http://www.andragogy.net.

Savicevic, Dusan (1991): *Modern Conceptions of Andragogy: A European Framework. In: Studies in the Education of Adults, Vol. 23*, No. 2, p. 179-191.

Savicevic, Dusan (1999): *Understanding Andragogy in Europe and America: Comparing and Contrasting. In*: Reischmann, Jost/ Bron, Michal/ Jelenc, Zoran (eds): *Comparative Adult Education 1998: the Contribution of ISCAE to an Emerging Field of Study*. Ljubljana, Slovenia: Slovenian Institute for Adult Education, p. 97-119.

Pöggeler, Franz (1957): *Einführung in die Andragogik. Grundfragen der Erwachsenenbildung. Ratingen*: Henn Verlag.

Tough, Allen (21979): *The Adult's Learning Projects. Toronto*: The Ontario Institute for Studies in Education.

Webbster's New World Dictionary of the American Language (1982). New York: Warner Books.

Zmeyov, Serguey (1998): *Andragogy: Origins, Developments, Trends. In: International Review of Education. Vol. 44*, No. 1, p. 103-108.

References

Experiential learning
Calkins, L. (1991). *Living between the lines.* Portsmouth, NH: Heinemann Educational Books, Inc.

Freire, P. (1971). *Pedagogy of the Oppressed*. NY: Continuum.

Goodlad, J. (1984). *A place called school: Prospects for the future*. NY: McGraw Hill.

Kielsmeier, J., & Willits, R. (1989). *Growing hope: A sourcebook on integrating youth service into the curriculum*. St. Paul, MN: National Youth Leadership Council, University of Minnesota.

Lempert, David and others (1996). *Escape from the ivory tower: Student adventures in democratic experiential education*. San Francisco: Jossey-Bass Publishers.

Rohnke, K. (1989). *Cowstails and cobras II*. Dubuque, IA: Kendall/Hunt Publishing Company.

Rolzinski, C. (1990). *The adventure of adolescence: Middle school students and community service*. Washington, DC: Youth Service America.

Problem Posing
Freire, P. (1970) *Pedagogy of the Oppressed*. New York: Continuum.

Gardner, H. (1991) *To Open Minds*. New York: Basic Books.

Shor, Ira (1992) *Empowering Education: Critical Teaching for Social Change* Chicago: University of Chicago Press.

Slavin, R. (1995) *Cooperative Learning* Boston: Allyn and Bacon.

Service Learning
ABET, *Criteria for Accrediting Engineering Programs, The Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.*, 2005

Furco, A. (1996) *Expanding Boundaries: Serving and Learning*, Florida Campus Compact

Ben-Ari, M. *Constructivism in Computer Science Education*, SIGCSE, 1998

R. K. Coll and T. G. N. Taylor, Using Constructivism to Inform, Tertiary Chemistry Pedagogy, Chemistry Education: Research and Practice in Europe, vol. 2, pp. 215–226, 2001.

Active Learning

Bonwell, C. & Eison, J. (1991). *Active Learning: Creating Excitement in the Classroom AEHE-ERIC Higher Education Report No.1.* Washington, D.C.: Jossey-Bass.

Hyman, Ronald T. 1980. *Improving Discussion Leadership*. New York: Columbia Univ., Teachers College Press.

Mayer, R. (2004). *"Should there be a three-strikes rule against pure discovery learning? The case for guided methods of instruction"*. American Psychologist 59 (1): 14-19.

Penner, Jon G. 1984. *Why Many College Teachers Cannot Lecture. Springfield, Ill.*: Charles C. Thomas.

Vygotsky, L. S. (2006 (New Ed.)). *Mind in Society: Development of Higher Psychological Processes.* Cambridge, MA: Harvard University Press.

Collaborative Learning
Johnson, R. T., & Johnson, D. W. (1986). *Action research: Cooperative learning in the science classroom*. Science and Children, 24, 31-32.

Rau, W. & Heyl, B. S. (1990). *Humanizing the college classroom: Collaborative learning and social organization among students*. Teaching Sociology, 18, 141-155.

Slavin, R. E. (1989). *Research on cooperative learning: An international perspective. Scandinavian Journal of Educational Research*, 33(4), 231-243.

Totten, S., Sills, T., Digby, A., & Russ, P. (1991). *Cooperative learning: A guide to research*. New York: Garland.

THE E4 PROJECT

EDUCATION FOR EMPLOYMENT

Design: www.littleduck.ie

An Roinn Fiontar, Trádála agus Fostaíochta
Department of Enterprise, Trade and Employment

EUROPEAN SOCIAL FUND:
helping develop employment by promoting employability, the business spirit and equal opportunities and investing in human resources

COMMUNITY equal INITIATIVE

Killester College of Further Education

Central Remedial Clinic

National Learning Network
Investing in People, Changing Perspectives

D·I·T
Dublin Institute of Technology
Institiúid Teicneolaíochta Átha Cliath

Institute of Technology Blanchardstown
Institiúid Teicneolaíochta Bhaile Bhlárnain

independence options rights empowerment

THE E4 PROJECT

EDUCATION FOR EMPLOYMENT

THE E4 PROJECT EDUCATION FOR EMPLOYMENT