Learning theories, stages and styles

Key concepts

- Learning theories: 'students as empty vessels waiting to be filled' (behavioural learning); cognitive engagement (cognitive learning); active construction of knowledge (constructivist learning)
- Learning stages and Learning styles: students learn in many different ways

Students learn in different ways which tends to depend on their personality, cognitive processes and previous learning experiences (e.g. Riding and Rayner, 1998). It is therefore important to take this into consideration when planning modules, so that a range of learning theories (e.g. behavioural, cognitive and constructivist learning), stages (e. g. Kolb's learning cycle theory) and styles can be accommodated. This is particularly significant with the greater diversity of students studying at higher education level (see Why enquiry-based learning? and Socio-political issues section).

Learning theories

There are three broad categories of learning theory:

- Behavioural
- Cognitive
- Constructivist

Behavioural learning

Within behavioural learning the learner is reactive to conditions in the environment rather than taking an active role in discovering the environment. This type of learning is effective in facilitating learning that involves recalling facts, defining and illustrating concepts, applying explanations and automatically performing a specified procedure. The student's role in this type of learning is largely passive and virtually totally dependent on the teacher, video demonstration, etc.

Examples of related teaching methods: Traditional teaching is largely based on behavioural learning. This type of learning tends not to employ problem solving, reasoning and thinking and focuses on what the lecturer does rather than the student. However lecturing can be a part of the enquiry-based learning experience, if students listen to the lecture in a critical way and process what the lecturer is teaching. Another example of behavioural learning is rote learning for an exam.

Cognitive learning

Cognitive learning theory focuses on the processes of:

- Thinking
- Concept formation
- Reasoning
- Problem-solving

The key tenets of cognitive learning theory are:

– Learning improves as the quality of cognitive engagement increases (Uden and Beaumont, 1996)

– Cognitive engagement enables the intentional and purposeful processing of lesson content (Hannafin, 1989)

– Engagement requires strategies that promote manipulation of information rather than memorisation (Hannafin, 1989)

– Learning takes place most effectively when students are actively engaged and learn in the context in which the knowledge is to be used (Uden and Beaumont, 2006)

Examples of related teaching methods: Problem-solving, research projects, creative visualisation, brainstorming

Constructivist learning

Constructivist learning theory is where students create their own meaning and understanding, rather than simply memorising or taking on others' conceptions of reality. Learning is an active process which is based on the assumption that knowledge is constructed by learners as they attempt to make sense of their experiences. Learners are not 'empty vessels waiting to be filled' (see behavioural learning) and instead actively construct knowledge based on prior experiences. The construction of knowledge is a function of the prior experience, mental structures and beliefs that one uses to interpret objects and events (see past learning in Philosophical underpinnings section).

Kirschner, Sweller and Clark (2006) advocate the use of strong instructional guidance rather than constructivist-based minimal guidance during the instruction of novice to intermediate learners. However this research does not mention work by Vygotsky (1978) on the Zone of Proximal Development or Bruner (1978) with the notion of scaffolding. Other researchers

suggesting that novice learners are to be provided with direct instructional guidance on the concepts and procedures required by a particular discipline and not left alone to discover such procedures include: Cronbach and Snow (1977); Klahr and Nigam (2004); Mayer (2004); Shulman and Keisler (1966) and Sweller (2003).

Examples of related teaching methods: Reflective logs and journals, experiential learning (e.g. work-based learning), laboratory and practical work, action learning, role play, small group work.

Social constructivist learning theory is viewed as a social process in which meaningful learning occurs when individuals are engaged in social, collaborative activities.

Examples of related teaching methods: Group work, discussion and debate.

Learning stages

Kolb's learning cycle theory (1976) describes the stages of learning as knowledge, experience and skills are acquired. This perspective of learning is called 'experiential learning' or 'learning by doing' and relates to constructivist learning. The cycle can begin from any one of the four stages (feeling, watching, thinking or doing, Figure 2) and link to any other stage.

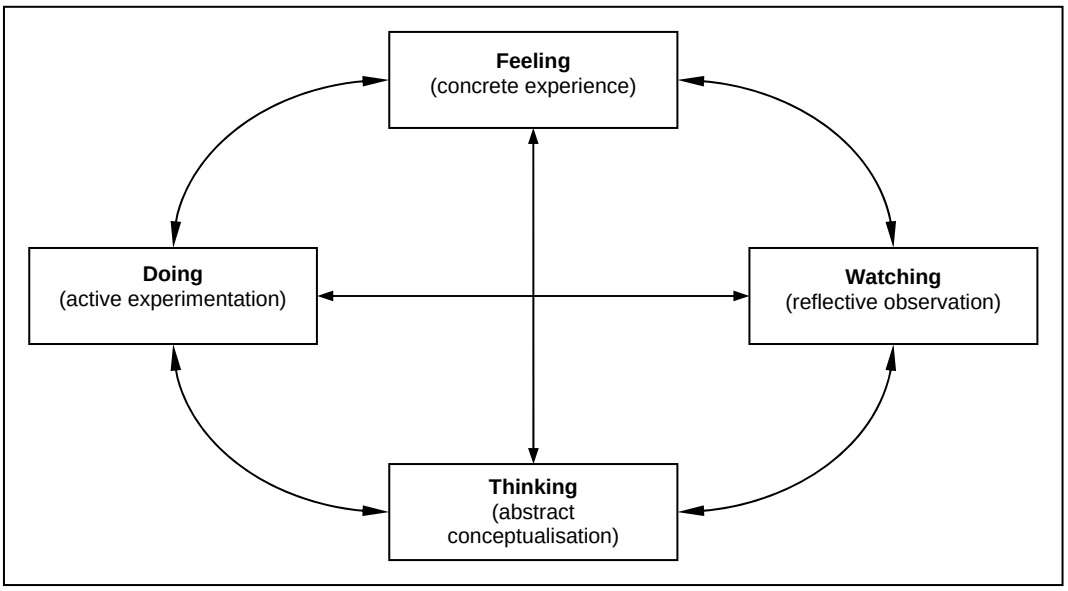

Figure 2 Kolb's learning cycle (Kolb, 1976, 1977, 1984, 1985)

Stages (or modes) of learning in Kolb's cycle:

- *Feeling*
    - Learners are involved in new experiences *(also known as concrete experience)*
- *Watching*
    - Learners must make/have time and space to be able to reflect on their experiences from different perspectives *(also known as reflective observation)*
- *Thinking*
    - Learners must be able to form, re-form and process their ideas, take ownership of them and integrate their new ideas into sound, logical theories *(also known as abstract conceptualisation)*
- *Doing*
    - Learners need to use understanding to make decisions, solve problems and test implications in new situations *(also known as active experimentation)*. These activities generate material for the starting point of the next round – concrete experience

Learners tend to differ in their tendencies and preferences to learning due to personality, cognitive processes and prior learning experiences. Taking this into consideration can enhance the learning experience for a broad range of students. Hudak (1985, 402) argues that "when students are matched with their preferred instructional mode, achievement and satisfaction with learning will be enhanced". Teaching in a variety of ways can enable every student's needs to be reached. However care also needs to be taken not to needlessly reward or value particular learning stages.

Learning styles

Kolb (1981) argues that learning environments which fail to match preferred learning styles are likely to be rejected or resented. Ash (1986) argues that business and industrial trainers can reach trainees more effectively by identifying their cognitive or learning style with appropriate instructional strategies.

Kolb (1984, 1985) classified ways of learning (learning styles) into four categories (feel and do, feel and watch, think and watch and think and do) which learners respond most positively to (also known as the Learning Style Inventory). This can be viewed as a matrix. Therefore a

student who has dominant learning stages of ‘doing’ and ‘feeling’ will have a learning style which combines and represents these processes, namely ‘feel and do’ (accommodating).

- *Feel and do*

  The process by which students modify what they already know to take into account new information. Students respond most positively to new experiences and problems, excitement and freedom in their learning *(also known as accommodating).*

- *Feel and watch*

  Students respond most positively to structured learning activities when they are provided with time to observe, reflect, think and work in a detailed manner *(also known as diverging).*

- *Think and watch*

  Incoming information is changed or modified in students’ minds so that they can combine it with what they already know. Students respond most positively to logical, rational structured and clear aims, when they are given time for methodical exploration and opportunities to question and stretch their intellect *(also known as assimilating).*

- *Think and do*

  Students respond most positively to practically based, immediately relevant learning activities, which allow scope for practice and the use of theory *(also known as converging).*

Kolb’s Learning Style Inventory has been criticised for lack of psychometric rigour. Empirical studies also report a lack of verifiability using the measure in pilot studies (e.g. Freedman and Stumpf, 1981; Allinson and Hayes, 1988; Cornwell et al., 1991; Veres et al., 1991; De Ciantis and Kirton, 1996). However Kolb (1976) and Kolb, Baker and Gish (1979) stress that the inventory is only a starting point for understanding one’s approach to learning that should be supported by other data about how one learns.

Honey and Mumford (1986, 1992) developed a learning styles system which is a variation on Kolb’s model.

1. *'Having an experience'* (compare to concrete experience) (stage 1), and *activists* (compare to accommodating) (style 1): Learns best from activities where there are new experiences/problems; there is excitement/drama/crisis; involvement with other people, e.g. to bounce ideas and solve problems as part of a team.

2. *'Reviewing the experience'* (compare to reflective observation) (stage 2) and *reflectors* (compare to diverging) (style 2): Learns best from activities where there is encouragement to watch and think over activities; there is an opportunity to listen to/observe a group; able to reach a needed decision without pressure and tight deadlines.

3. *'Concluding from the experience'* (compare to abstract conceptualisation) (stage 3) and *theorists* (compare to assimilating) (style 3): Learns best from activities where there are structured situations with a clear purpose; required to understand and participate in complex situations; time to explore the associations and interrelations between ideas, events and situations.

4. *'Planning the next steps'* (compare to active experimentation) (stage 4) and *pragmatists* (compare to converging) (style 4): Learns best from activities where there is an obvious link between the subject matter and a problem set; practising techniques with coaching/feedback; given techniques that are applicable to the real world.

It is interesting to note that Honey and Mumford's learning styles system has never been completely validated. For viewpoints on the Learning Styles Questionnaire which determines preferred learning styles put forward by Honey and Mumford (1986) see Allinson and Hayes (1990) and Furnham (1995).

Other approaches to learning styles have been put forward with emphasis on orientation to study (e.g. Approaches to Study Inventory (Entwistle, 1979, 1981)); instructional preference (e.g. Learning Style Inventory (Price et al., 1976, 1977; Dunn et al., 1989)); and cognitive skills development (e.g. Cognitive Style Delineators (Letteri, 1980)). A critical review of different style models is discussed in Riding and Rayner (1998).

In summary learners tend to have preferred learning styles. Such preferences can vary from time to time and situation to situation (Kolb, 1981). Knowing the learning style can assist in not repeating mistakes by undertaking activities that strengthen other styles. There can also be a danger in using learning style types as fixed traits, as individuals and their behaviour can become stereotypes (Kolb, 1981). Furthermore some students may struggle and take time to adjust to learning styles which they are not familiar with.

Rush and Moore (1991) argue that matching the learning style and learning activity may improve learning performance within a specific context, although it will do nothing to help prepare the learner for subsequent learning tasks where the learning activity does not match the individual's preferred learning style. In relation to the assumption that matching learning style with learning activities will promote learning, Honey and Mumford (1986) offer advice on how individuals might choose learning activities to suit their style and how they can be helped

to identify learning opportunities and exploit them in ways that are congruent with their preferred style. However studies by Allinson and Hayes (1988, 1990) did not provide any support for the hypothesis that matching learning style and learning activity improves learning achievement.

As some learning environments can appeal to those learners with a specific learning style and hinder those with a preference for a different approach to learning (e.g. Kolb, 1981), it is useful to consider a variety of approaches when planning a module, to take various learning styles into consideration, for fully effective learning. This may involve developing a range of learning activities designed to offer the same learning content or modifying instructional treatment or verbal and visual content to accommodate a wider range of learning styles within a single learning activity (Hayes and Allinson, 1996). Care also needs to be taken not to needlessly reward or value a particular learning style.