

## ***A Critical Analysis of Learning Styles and Multiple Intelligences and their contribution to inclusive education***

### **Introduction**

This paper will discuss learning style theory and Gardner's theory of multiple intelligences. These theories have been influential on educational practice in recent years and they have offered potential solutions to educators in addressing issues of student disengagement and educational underachievement. However, this paper argues that both learning style theory and the theory of multiple intelligences should be treated cautiously. The paper explores both the strengths and limitations of each theory and concludes that there is insufficient convincing evidence to support their use in shaping pedagogy.

### **Learning Style Theory**

Many teachers use the term 'learning styles' uncritically as part of day-to-day vocabulary. The theory assumes that students have a dominant channel (visual, auditory or kinaesthetic channel) through which they learn most effectively. Based on this premise it is assumed that if learning takes place using the dominant channel then learning will be more effective. The theory has direct practical importance for educators in that once a learning style has been assessed and identified through a learning style inventory then pedagogy can be adapted to enable the learner to learn through their dominant channel. There are numerous models (for example, Kolb, 1984; Honey and Mumford, 2000), each accompanied by an assessment which seeks to identify a dominant style based on an individual's responses to a series of questions about their learning behaviour. Each model has its own associated technical vocabulary (Coffield, 2004a; 2004b) and opposing categories, known as dichotomies.

## **Critiques of Learning Styles**

A belief in the value of learning styles theory is evidently persistent, despite the prominence of critiques of this theory. One study found that an overwhelming majority of teachers across the world agreed that individuals learn better when they receive information in their preferred modality (Howard-Jones, 2014). Some writers have attempted to account for the popularity of learning style theory (Riener and Willingham, 2010), but there is clear psychological evidence that there are no benefits for learning from attempting to present information to learners in their preferred learning style (Pashler et al, 2009; Geake, 2008; Riener and Willingham, 2010; Howard-Jones, 2014). Coffield (2012) argues that 'In short, the research field of learning styles is theoretically incoherent and conceptually confused' (p.220). There is an absence of an agreed theory or agreed technical vocabulary to underpin this theory and that essentially weakens the theory.

Supporters of learning style theory often present approaches to learning in the form of a pyramid which shows the percentages of information retained if content is introduced to students in different ways, for example visually, auditory or kinaesthetically. However, learning occurs when students use cognitive thought processes to think about things (Willingham, 2008), Cognitive thought might be achieved by being 'active' or 'passive' and therefore this reduces the validity of learning style theory.

Research evidence, broadly supports direct instruction (Kirschner et al, 2006) rather than discovery learning. Although kinaesthetic approaches to learning can be useful in fostering motivation, if teachers want students to learn new knowledge, ideas or strategies they need to teach them directly. This research challenges constructivist learning theory which partly underpins learning style theory.

It has been argued that research in the field of learning styles is incoherent and conceptually flawed (Coffield et al 2004a; 2004b). This can be illustrated by the sheer number of dichotomies which the different models present and the overlap between them. Stan Ivie (2009) highlights how John Dewey rejected binaries (either/or thinking) which create false dichotomies and that in reality sharp distinctions do not exist, for example, activists/reflectors.

There is no agreed technical vocabulary and no agreed theory to underpin the dichotomies (Coffield et al 2004a; 2004b). Additionally, learning style theory has become commercialised in recent times. The growth of the learning styles industry in recent years (Coffield et al 2004a; 2004b) and the excessive number of models available serve to reduce the credibility

of learning style theory. Coffield (2012) argues that the existence of 70 learning style instruments demonstrates the disorganised nature of this field of enquiry. In the absence of an agreed model or agreed vocabulary this creates confusion amongst educators who are responsible for meeting the needs of their students.

### **Learning Style Tests**

Learning styles are assigned on the basis of an individual completing a test in which they are required to make generalisations about how they might respond to specific challenges. However, individuals may not be able to assign a category to their behaviour; they may give responses which are socially desirable and they may feel constrained by the predetermined format of the test (Coffield et al 2004a; 2004b). Coffield (2012), in his critique of learning style inventories, argues that context largely shapes how we behave. As individuals respond to various challenges throughout a day they will be required to use a range of learning styles and this undermines a theory which suggests that there is a dominant learning style.

The statements on learning style questionnaires are often decontextualized. A good example of this is presented by Sternberg using the following example: *When faced with a problem, I like to solve it in a traditional way*" (Sternberg, 1999). When faced with this statement the reader has to be able to make a response based on the limited range of information given. Using this example to illustrate the problem of decontextualisation it is not clear what type of problem is being referred to in this statement. Additionally, there is no reference to the context in which the problem has manifested itself. The context can largely influence how people respond to problems. For example, problems in the workplace may be addressed in very different ways to problems which occur within friendships, relationships or other social groups. Some problems can be addressed individually whilst it may be more effective to address other problems collectively. However, the statement assumes that the problem should be addressed by an individual rather than a larger collective. It is not clear to the reader what is meant by a 'traditional' response to a problem and it could be argued that some problems necessitate an innovative response rather than a 'traditional' response (Coffield et al 2004a; 2004b). Far too much is left to interpretation and the reader is left to make a choice from a pre-determined list on the basis of this interpretation. Although it is highly unlikely that there will be one way of solving a problem the question nevertheless implies that this is the case. These arguments weaken the credibility of learning style theory.

It is important for students know how to enhance their learning by developing a *repertoire* of approaches (Coffield et al., 2004a; 2004b) because students need to use different learning styles to complete different kinds of tasks. Additionally, effective learners use a range of styles of learning rather than relying predominantly on one dominant learning style. According to Coffield et al (2004a; 2004b) there is no substantial evidence that matching learning style to tasks (matching hypothesis) increases educational attainment. In fact, evidence from empirical studies of matching is contradictory (Coffield et al 2004a; 2004b) therefore it would be unwise to base pedagogical decisions upon research evidence which is inconclusive.

Coffield et al (2004a; 2004b) argue that learning styles can artificially restrict students' learning experience by limiting channels through which learning takes place. Learning style theory also leads to the assumption that learners have a fixed style of learning which cannot be changed (Coffield et al 2004a; 2004b). This is an unwise assumption for both educators and students because it limits the opportunities for learning.

According to Garner (2000) there is confusion as to whether Kolb is arguing for learning style *traits* (which are stable) or *states* (which are flexible). This lack of clarity in articulating a theory undermines its credibility. It has also been argued that Kolb lacks clarity on whether his theory actually promotes learning *styles* or four *stages* of learning (Bergsteiner et al 2010). Additionally, Kolb's model fails to differentiate between primary and secondary learning processes, it fails to differentiate between learning activities and typologies of learning and it ignores certain learning constructs (Bergsteiner et al 2010). However, in contrast there is a substantial body of literature which has emphasised the usefulness of Kolb's theory (Abbey et al, 1985; Kruzich et al, 1986; Nulty and Barrett, 1996; Raschick et al, 1998).

Bjork and Bjork (2011) refer to one common assumption on which learning style theory is based. Learning style theory assumes that keeping learning constant and predictable will improve later retention. However, they found that varying the types of task that learners complete and varying the learning context in fact improves retention of knowledge and skills.

### **Multiple Intelligences**

Charles Darwin was the first psychologist to measure intelligence directly and during the early 20<sup>th</sup> century prominent psychologists developed a series of tests designed to measure intelligence (Binet and Simon, 1916; Spearman, 1927; Terman, 1916; Thurstone, 1938).

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However, despite these early advances in measuring intelligence the work of Gardner later in the twentieth century (Gardner, 1975; 1979; 1982) had begun to challenge traditional views of intellect, which had emphasised how specific aspects of brain functioning were part of a single “semiotic function” (Gardner and Hatch, 1989: 5). Research in the latter part of the twentieth century had suggested that the human mind was modular and that distinct psychological processes were evident when dealing with different kinds of mental functions (Gardner, Howard and Perkins, 1974; Gardner and Wolf, 1983). Traditional intelligence, aptitude and achievement tests had over-emphasised logical and linguistic capacities (Gardner and Hatch, 1989). However logical-mathematical and linguistic symbolisation were (and to a certain extent still are) predominant forms of symbol use in schools which marginalises those students who are unable to demonstrate achievements in these domains.

IQ testing is one way of measuring general intelligence. Although the value of these tests has been disputed in the academic literature (Strydom and Du Plessis, 2000) other academic commentators have pointed out that they provide a useful indication of a child’s general cognitive abilities (Nettelbeck and Wilson, 2005). Despite these differences in opinion there is now a consensus that intelligence represents an ‘ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, [and] to engage in various forms of reasoning to overcome obstacles by taking thought’ (Neisser et al., 1996: 77). However, theorists (Gardner, 1983; 1999) envisaged cognitive abilities as several forms of intelligence which are unrelated rather than viewing general intelligence as an indication of cognitive ability.

Gardner was concerned that this narrow measure of intelligence failed to recognise that human activity involves other varieties of symbol use. Gardner developed a broader definition of intelligence which included problem solving and practical forms of intelligence. He saw the human intelligences as relatively autonomous, meaning that one was not dependent on the other. In collaboration with his colleagues, Gardner carried out a systematic review of the literature on human intelligence. They examined the cognitive capacities of typically developing individuals as well as the cognitive capacities of prodigies, atypically developing individuals and savants. They found that individuals differ in their intelligence profiles and that there was no inevitable correlation between any two intelligences. MI theory was introduced by Gardner in his book *Frames of Mind* (1983). Initially Gardner concluded that there were seven intelligences (linguistic; logical-mathematical; musical; spatial; bodily-kinaesthetic; intrapersonal; interpersonal) and in 1995 he added an eighth intelligence- naturalistic). The assumption of the theory is that the

intelligences are independent of each other and that individuals often demonstrate an uneven profile in that some intelligences will be greater than others.

Standard intelligence tests demonstrate a bias towards logical and linguistic skills. The assessment of intelligence using these tests is carried out artificially by removing a child from the social context in which learning takes place. In contrast assessment of multiple intelligences is not decontextualized and takes place within a familiar social and cultural context (Gardner and Hatch, 1989), thus making the assessment more naturalistic. Almeida (2010) has argued standard intelligence tests used in psychology are not significantly different to those used a century ago. This is despite advances in socioconstructivist learning theory which has emphasised the importance of social and cultural factors in the learning process and the role of talk in promoting learning. Despite these developments within learning theory a psychometric approach to testing intelligence is still the dominant approach (Almeida, 2010). The psychometric tests present items in an abstract manner and terminology is often vague and generalised.

Gardner's work on intelligence presents an alternative to the dominant psychometric approaches. Assessment of intelligence takes place within classroom contexts and therefore the assessment has better ecologic validity than standard psychometric tests (Almeida, 2010). Intelligence relates to the ability to undertake a wide variety of problem solving tasks, the ability to think in an abstract manner and an ability to infer relationships, thus highlighting the multi-dimensional nature of intelligence (Almeida, 2010). In addition, different individuals pursue different goals and therefore it seems logical to argue that there are many different types of intelligence (White, 2006).

Gardner's theory has several important applications: these include planning schemes of work which span all the intelligences; providing intervention programmes in areas of weakness or enrichment programmes in areas of strength for learners with special educational needs or gifted students (Klein, 1997). In addition, the theory challenges those schools which currently over-emphasise logical-mathematical and linguistic knowledge to adapt the pedagogical approaches that are adopted so that the different intelligences are reflected in models of curriculum delivery.

## Critiques of the theory of Multiple Intelligence

According to John White:

Putting children into boxes that have not been proved to exist may end up restricting the education they receive, leading teachers to overly rigid views of individual pupils' potentialities, and, what is worse, a new type of stereotyping.

(White, 2005: 9)

Multiple intelligence theory has been rejected outright by researchers that support psychometric approaches to measuring intelligence (Brand, 1996; Sternberg, 1983) with some claiming that Gardner's intelligences are *styles* of cognition rather than intelligences per se (Morgan, 1992).

Although Gardner has emphasised the separate intelligences work largely independently most activities tend to draw on several intelligences (Klein, 1997). Nettelbeck and Wilson (2005) emphasise that Gardner's separate intelligences overlap rather than exist independently. For example, Klein (1997) highlights that *conversation* draws on both interpersonal **and** linguistic intelligences. Although Gardner has emphasised that pairs of intelligence may overlap or be correlated in some way this weakens his claim for categorising the intelligences as entities which are distinct from one another. If intelligence systems work together in practice then this could in fact support the notion of one general intelligence and that abilities in specific areas are merely *components* of this intelligence.

Although Gardner cites examples of geniuses, many of these geniuses excel in more than one domain and *within a subset* of a domain rather than demonstrating high performance throughout as domain (Klein, 1997) Additionally many geniuses do not fit the categories of Gardner's intelligence and given that geniuses are rare, these examples are unhelpful as a basis for educational practice (Klein, 1997). This weakens Gardner's work. For example, Gardner discusses savants; individuals who do one thing very well. However, Klein challenges this by pointing out that these individuals do not usually excel across a *whole domain* (Klein, 1997). Klein uses the example of hyperlexic autistic readers who can decode print well but have poor comprehension - therefore they do not have high linguistic intelligence. Children with dyslexia may have good listening comprehension or oracy skills whilst at the same time have poor phonological skills. Therefore dyslexics do not necessarily demonstrate a weakness across the entire domain of linguistic intelligence. Some pupils may have particular strengths in solving calculations but demonstrate poor spatial

awareness, thus demonstrating an uneven profile across the domain of logical-mathematical intelligence.

Furthermore, Gardner's model relates *achievement* in specific areas to intelligence in contrast to traditional views of intelligence which focus on cognitive thought processes. However, the linking of intelligence to achievement is problematic because it suggests that this achievement will have relative stability over time (Klein, 1997). However, achievements can decline over a period of time, particularly if skills are not practised. In contrast cognitive thought processes have relative stability over time and this raises questions about whether intelligence should be defined on the basis of specific abilities, skills and talents rather than on the basis of an individual's cognitive thought processes.

A significant limitation of Gardner's theory is that students who score low in a specific intelligence might avoid activities that draw on this intelligence even though they might learn through perseverance (Covington, 1992; Palmquist and Young, 1992). Additionally children might choose to disengage with activities which they find challenging (Klein, 1997). Klein (1997) emphasises that reliable methods for assessing the different intelligences in Gardner's theory have not been established and that the categories are too broad to be useful.

Gardner fails to specify the evidence which supports each intelligence and therefore multiple intelligence theory lacks empirical support (Waterhouse, 2006). Gardner fails to provide a set of sub-components which can be tested for each intelligence (Waterhouse, 2006). The various intelligences are described by general characteristics rather than specific components and this has prevented researchers from conducting rigorous tests to explore the validity of his theory (Waterhouse, 2006). Gardner assumed that the theory required no empirical validation because the theory is based on a synthesis of research findings. However, multiple intelligence theory merely *assumes* the validity of the intelligences because there is no rigorous way of actually testing these (Waterhouse, 2006).

## **Conclusion**

Coffield (2004 a; 2004b) argue that research evidence on formative assessment (Black and Wiliam, 1998) is academically robust so it would be better for educators to concentrate on developing this aspect of their pedagogy rather than focusing on learning style theory which has no agreed theoretical base and no robust assessment procedure to underpin the various models. Learner feedback is critical in promoting learning by accelerating achievement

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(Black and Wiliam, 1998) but there is no biological or educational justification for dividing learners into learning style groups. Theories of multiple intelligence also lack empirical justification because there is no agreed tool for measuring intelligence within each domain. Additionally, learners are unlikely to excel across a whole domain and are more likely to demonstrate strengths in specific aspects within a domain. Different tasks require different abilities and therefore it seems illogical to group learners using artificial constructs. Both theories categorise learners either on the basis of learning style or intelligence and these categories place restrictions on students which can be detrimental to learning. Effective learners use a range of different styles of learning and abilities in different tasks and therefore it seems more logical for educators to ensure that they use a wide range of pedagogical approaches which enable students to use a variety of channels of learning.

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