Learning Styles – what can they offer?

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Abstract

The use of learning style theory often appears to be an unquestioned universal panacea for educators. It has even been taken apparently uncritically into the KS3 Strategy for England. This document considers the challenges to this sentiment and attempts to draw some conclusions as to how far learning style preferences can be used to enhance learning. In so doing it concludes that as soon as you correctly remove the student labelling function of learning style profiles you are more likely to be considering the principles of deep *learning* and how this can be encouraged.

Introduction

> *Hello my name is Neil. I'm a left-brain, visualist, slight extravert. I tend to intuitive, feeling and perceiving. I'm wholist, logical-mathematical and reflective. I tend to deep learning. I'm somewhat of a theorist. But to adapt the retort of Patrick McGoohan's character from 'The Prisoner', "I am a name not a label!".*

In their Key Stage 3 Strategy (now Secondary Strategy) documents, the DfES (2004) make it clear that they have an expectation that teachers will know, understand and make use of learning styles. They, in common with many users of the term, have a tendency to omit the word *preferences* from the expression under most uses.

In this item I intend to review some of the literature looking at learning style preferences and to try to identify some key issues that need to be understood by teachers who wish to use (or who are expected to use) these concepts in their planning and delivery of learning.

Starting points

For a true understanding of the mechanism of learning some idea of the current model of how the brain works is useful. The human brain is a complex organ with levels of function that appear to be related to the phases of evolution of human anatomy. Consequentially, low-level activities that we have as automatic functions (breathing, pulse) are managed by the 'oldest' parts of the brain (the limbic system), and we have relatively little control over these especially at critical times (they continue to work whilst we are asleep for example). Later developed areas (such as the cerebral cortex) are understood to be where higher order processing (making relationships between objects and events, or memory) is undertaken.

Stafford and Webb (2004) provide an interesting collection of ideas and ways of testing those ideas, whilst Stewart (2004) provides a succinct introduction to the main psychological and sociological theories. Sousa (2000) and others provide a comprehensive review of how the biological brain might influence learning.

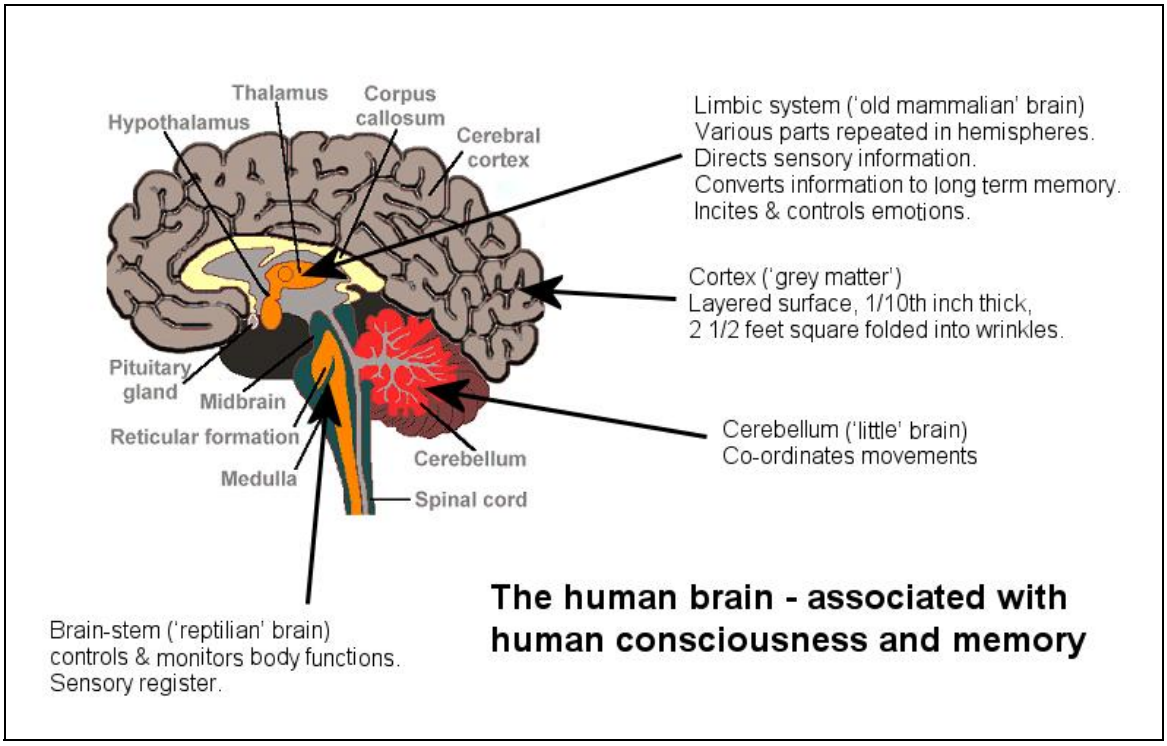

Figure 1: Important features of the human brain (source: various)

What are learning style preferences?

It is suggested that learners have a preferred mode (or modes) in which they will most effectively develop learning. For many their first introduction to learning styles was via the *Honey and Mumford* model (based on *Kolb's* work) and possibly as a result of reading the Quilt Learning Styles Publication (Lockitt, 1997).

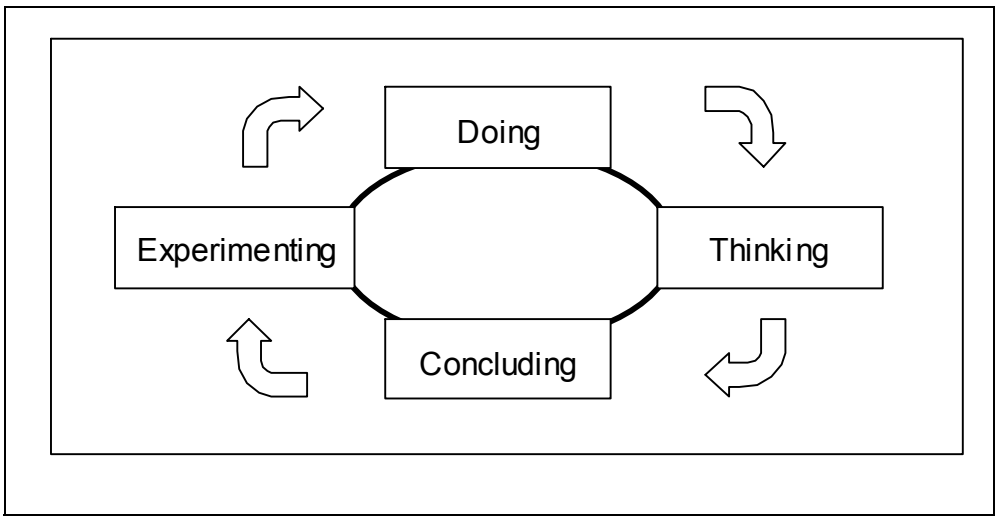

Figure 2: Kolb and learning style preference

Learners were seen to have a propensity to prefer to operate in only one of the aspects, and to avoid or treat cursorily the others.

More recently a model based on learning activity (and very popular in accelerated learning programmes) has achieved high popularity.

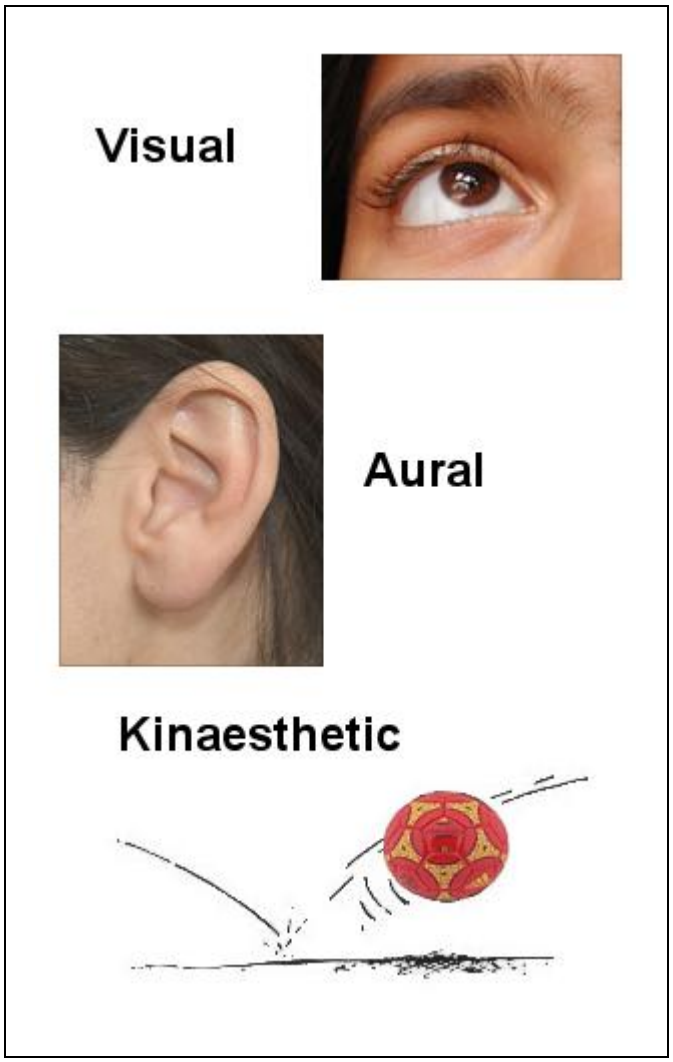

Figure 3: VAK

This model focuses on preferences by learners to learn by seeing, hearing or doing (and is the model emphasised by the DfES, 2004).

A casual search using *Google* will now bring up a far greater number of models; there are at least 71 with a major core of 13, according to Coffield *et al* (2004a:2).

Taking the tests

Although many of the inventories or tests to determine preferences were originally paper based most now have electronic or online versions (Advanology 2005, Cymeon 2005, VARK 2005). In general most require you to provide 'yes/no' answers or to select from small range numeric responses (of a Likert scale format). Tests range in question count from around 20 responses to around 75, and higher. It might be questioned how the lower value of this range can possible produce a valid diagnostic sample. Indeed Coffield *et al* note *"too much is being expected of relatively simple, self-report tests"* (2004a:57).

In addition the language of the questions can be quite subtle and subject to a variety of interpretations given the cultural background of the responder, questioning the ecological validity of the tool.

Although some tests can be taken at no direct cost (with web based material being forced to view adverts may be seen as an indirect cost) the majority remain the copyright of the originator or other publisher and may be significantly priced.

Interestingly, although the DfES do include a sample test and do direct readers to web based tests they comment, *"Whilst many schools use such questionnaires, others prefer to generate their own"* (DfES 2004:5). This also sets up the question in one's mind of the rigour of such a technique, and the amount of expertise necessary to produce a valid and reliable instrument.

Doubts

There are authors who question the whole domain of learning style preferences. Denzine (2005) identifies some of these ideas together questioning the:

> *"four core assumptions:*
> - *There are individual differences in learning.*
> - *An individual's style of learning is fairly stable across time.*
> - *An individual's style of learning is fairly stable across tasks/ problems/ situations.*
> - *We can effectively measure an individual's learning style"*

She goes on to conclude, *"an important question to ask is whether teachers should try to assess student's individual learning styles and provide personal instruction to match types of learners?"*

Other authors (Stitt-Gohdes 2001, Brown 2003) flag up the risk associated with a mismatch of learning style with teaching style.

> *"Specifically, there are four groups of learners who are typically at risk:*
> *1. Any student whose learning style does not match the teacher's learning style, especially if the teacher is inflexible in style or unaware of style differences.*
> *2. Any student whose learning style does not match the orientation of the curriculum.*
> *3. Any student who does not match the class profile (the set of predominant learning styles amongst any given group of students).*
> *4. Any student who is misplaced in the educational system from a mismatch between the student's learning style and the style of the placement test"*
> *(Leaver cited by Stitt-Gohdes 2001:33)*

Burns *et al* (1998) consider the preferences of high academic achievers, reaching the conclusion that *"learning style preference differences within an academic achievement group may be as great as the differences between the groups"* and *"all style preferences may be equally appropriate"*. More interestingly there is some evidence for an association of learning style preference with subject discipline in Higher Education (Nulty and Barrett 1996).

A serious criticism of the reporting on the individual testing and development of methods and items is the lack of consideration of the socio-economic and cultural context from the literature (Coffield *et al*, 2004a).

The Onion (2000) treats the whole idea of learning style preferences more 'sniffily', commenting that *" parents of nasal learners are demanding that U.S. public schools provide odor-based curricula for their academically struggling children"*. Citing a Dr Ira Green they say *"there are three distinct types of nasal learners: the goal-oriented nasal learner, the activity-oriented nasal learner, and the learning-oriented nasal learner"*, each type needing to be treated differently. The *"Stanford-Binet Nasal Index Exam"* contains questions such as *"I enjoy smelling things"*.

Others have even proposed that marriage partners should have compatible learning styles! (Coffield et al 2004a:3).

The range of learning style inventories

A variety of authors have set out to provide a critical review of learning styles (Klein 2003, Cassidy 2004, Melis and Monthienvichienchai, 2004), from both the psychological and curricular perspectives. Some of the models are based on theories about the functioning of the brain whilst others focus on psychological ideas such as personality traits. Both of these areas claim credence to accurate and reliable testing mechanisms.

Although focussing on usage in the post-16 age range, it is fortunate that Coffield *et al* (2004) have produced a rigorous analysis of the range of inventories (for some reason they have ignored the nasal model).

They have split the 71 models they traced into 5 categories, and within each category have focussed on the 13 models they felt to be key. For many even this 13 will contain models that they have not previously stumbled over. *Figure 4* indicates the models found and considered. (*Appendix A* gives a table of additional information about the models named in **bold**.)

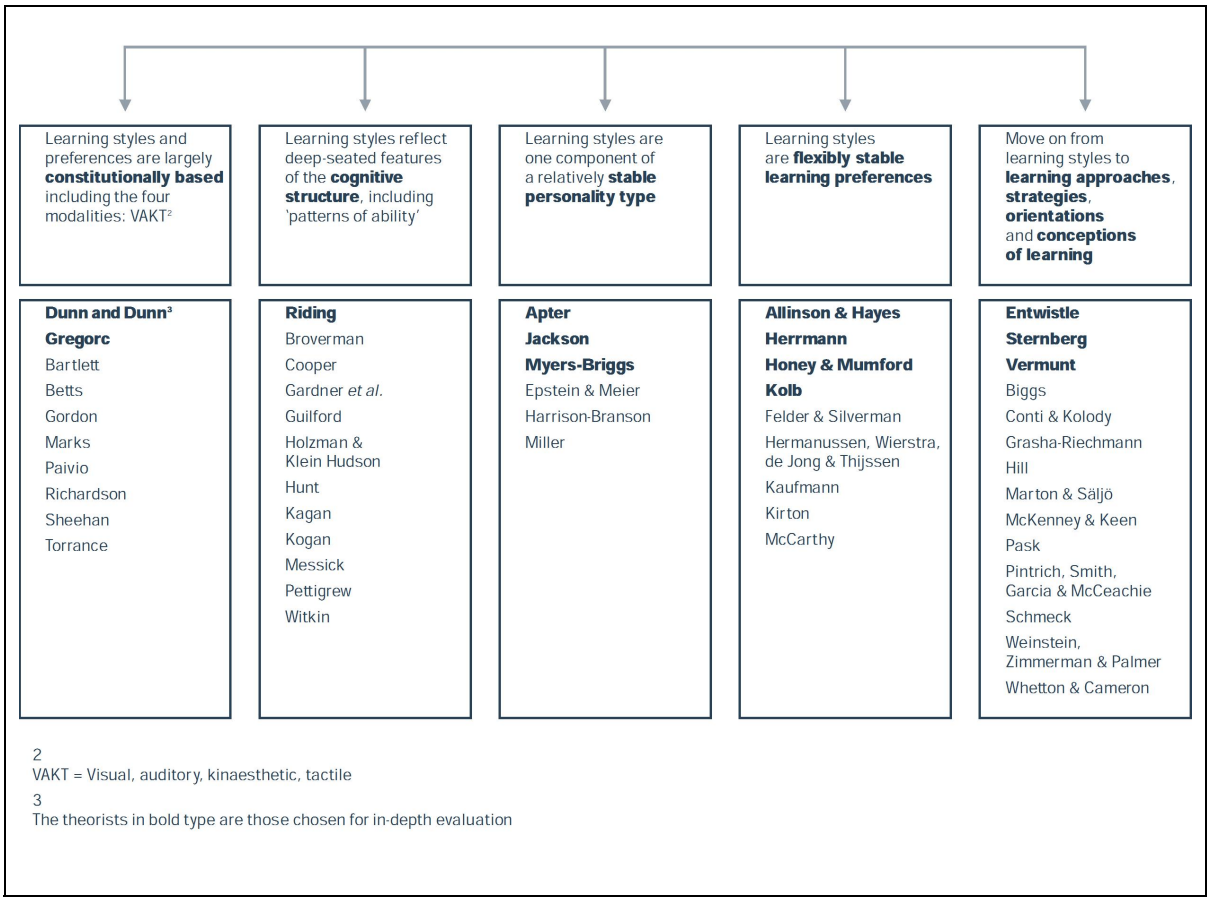

Figure 4: Families of learning styles (source: Coffield *et al* 2004a:20)

It can be noted from *figure 4* that the VAK and Kolb families are joined by 3 other categories; loosely based on cognition, personality and learning strategies.

Coffield *et al* (2004 and 2004a) provide a comprehensive analysis of the 13 models identified in bold text in *figure 4*. For each they provide a table that allows effective comparison between models (Appendix A gives a shortened summary of these tables).

In their discussion they note that:

> *"A thriving commercial industry has been built to offer advice to teachers, tutors and managers on learning styles, and much of it consists of inflated claims and sweeping conclusions which go beyond the current knowledge base and the specific recommendations of particular theorists". (Coffield et al 2004:36)*

One such example can be found in Cymeon (Cymeon Research 2005). Once registered a potential customer is deluged with a succession of briefing papers on the product as well as 'special deals'. Many of the tools cost significant amounts for participation in their programmes. Are they value for money?

Coffield *et al* argue that not only does it matter which of these models is used, but that the learning cycle (underlying the Kolb family of measures) gives them *"serious reservations"* (2004a:36).

However it needs to be noted that learning styles have appeal as simple solutions to raising attainment. Not in the least, because it might be seen to change the focus from the management process needed to enhance the quality of learning, to the individual learning styles of the teachers and learners. A cynic might suggest that this is one of the main reasons that they appear so uncritically in the *Pedagogy and Practice* strand of the Secondary Strategy (DfES 2004).

Where does this leave us?

If left to their own devices the majority of learners are unlikely to become aware of their learning style preferences and hence of options to learn in new ways. However:

> *"It is hard to imagine teachers routinely changing their teaching style to accommodate up to 30 different learning styles in each class, or even to accommodate 4* [from the learning cycle]. *(Coffield et al 2004a:40)*

Learning style preferences must not be used to label people; self-development is most likely to occur when the learner can be introduced to the particular strengths of different learning models. Learning style preferences should be seen as a potential agent of change,

offering opportunity for learners to learn how to learn more effectively and with more variety.

> *"A knowledge of learning styles can be used to increase the self-awareness of students and tutors about their strengths and weaknesses as learners. In other words, all the advantages for metacognition (ie being aware of one's own thought and learning processes) can be gained by encouraging all learners to be knowledgeable about their own learning and that of others" (Coffield et al 2004a:37)*

But the teacher cannot be left out of this:

> *"Any consideration of learners' styles should reciprocally acknowledge that individual HRD* [human resource development] *practitioners* [ie teacher] *will themselves have their own personal styles which will impact on their own learning; and the training and learning methods they adopt. ... However,, personal styles profiling is of value to HRD practitioners in that it may enable them to:*
> • *identify their own styles;*
> • *become aware of any bias or imbalance in the training and learning methods which they employ;*
> • *design and develop learning events which accommodate, or at least acknowledge, the personal styles of the learners." (Sadler-Smith 1996:35)*

Loo also concludes:

> *"It is recommended that educators use a variety of learning methods, and encourage students to be receptive to different learning methods, rather than to try to link specific learning methods to specific learning styles." (Loo 2004:107)*

One additional issue might be the Government's personalised learning agenda – part of the Secondary Strategy. In the FAQs (frequently asked questions) section of the DfES website on this they respond to:

> *"Does personalised learning mean identifying pupils' preferred learning styles?*
> *Personalised learning depends on knowing pupils better as individuals and as learners, but this does not mean labelling them in a particular style of learning. Personalised learning means matching teaching and learning more closely to the needs and aspirations of pupils so that they become better learners, broadening the range of learning skills and strategies which pupils can use in order to become independent learners. The learning styles idea is unhelpful when used to limit pupils' scope as learners, but it can be a helpful reminder to teachers to ensure that pupils are fully engaged in their learning by providing a range of different learning experiences and opportunities in which all pupils are emotionally, physically and intellectually involved."(DfES 2005)*

So it can be seen from this that this agenda has a less didactic approach to the concept of learning styles and how they are used, than the original *Pedagogy and Practice* materials (DfES 2004)

Ideas for planning for learning style variations

Much of the research into learning style preferences has been developed in the HE and FE sectors and even the validity some of it has in those environments must raise questions for use with younger learners. Indeed the tool that Coffield *et al* (2004) regard as the most resilient to their investigations, the Entwistle ASSIST model (ib p91) is a development within Higher Education.

Early in the development of the KS3 strategy a series of subject specific booklets were published (Learning Styles and writing in …). They focussed on variety in teaching and learning and included the diagram in *figure 5*. This merges the VAK measure with intra and inter-personal dimensions and makes a broad range of suggestions of how these preferences can be given comfort space in the classroom.

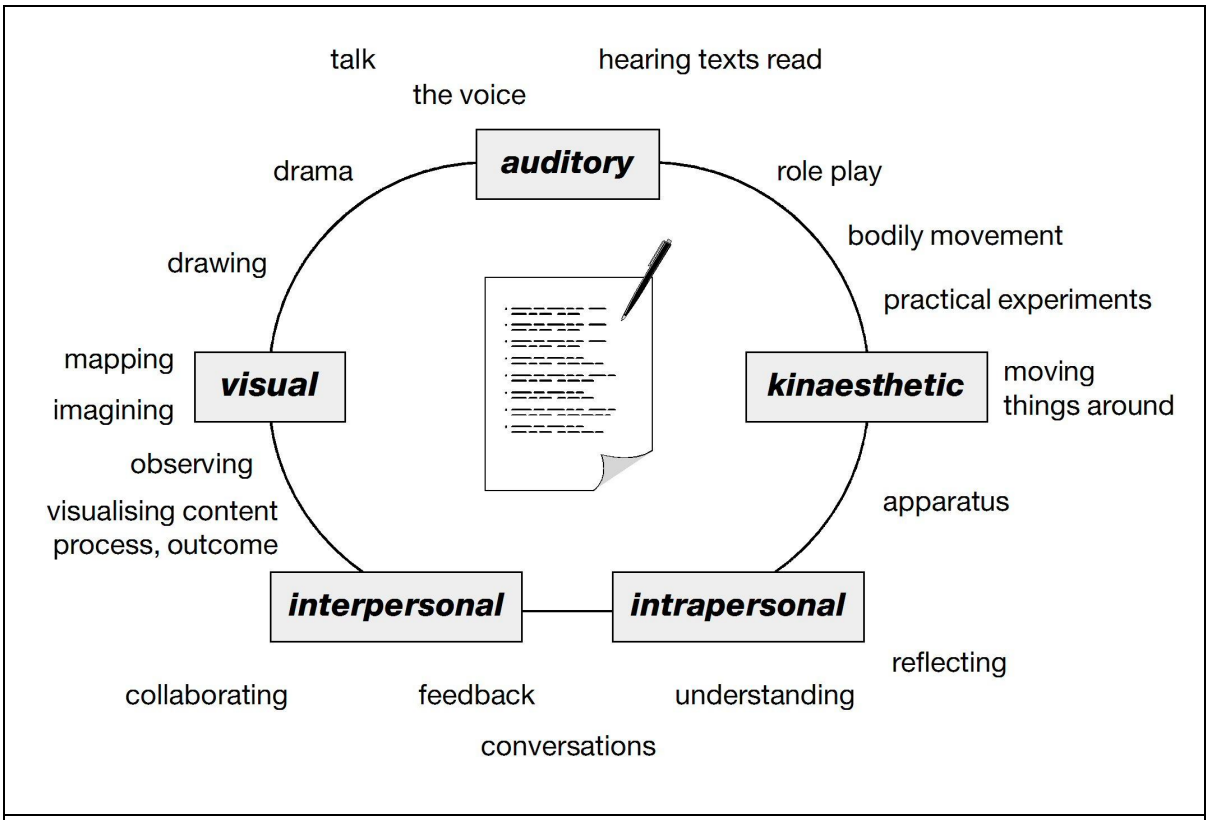

Figure 5: Learning and writing (Source: DfES 2002:3)

A variety of writers (including Felder and Solomon, 2005 and Intel, 2005) have identified ideas for accommodating and encouraging a wide variety of learning style preferences in the classroom. These are summarised in the tables below:

Visual

Can be helped by planning learning that	*Can help their own learning by*
Uses diagrams, video, graphics, pictures and models.	Using visual tools to help them summarise what they need to learn. Trying mind-mapping as a means to re-author and record material to be learnt.

Auditory

Can be helped by planning learning that	*Can help their own learning by*
Uses lectures, storytelling, music, and questioning.	Summarising what they need to learn in an audible form (recordings).

Kinaesthetic

Can be helped by planning learning that	*Can help their own learning by*
Involves role-play, acting and physical modelling.	Moving around as they learn and revise. Working through problems physically (shuffling papers or cards). Using exercise time to mentally review what they've been studying.

Serialist/Left Brain

Can be helped by planning learning that	*Can help their own learning by*
Uses stepped activities or algorithms to solve problems.	Looking at problems as a series of steps or as a flow diagram.

Holist/Right Brain

Can be helped by planning learning that	*Can help their own learning by*
Clearly shows the big picture, what we are trying to achieve.	A top down approach to problems, starting with the desired outcome.

Active learners

Can be helped by planning learning that	*Can help their own learning by*
Involves discussion or explanation to others.	Working in groups to support others. Putting ideas into their own words.

Reflective learners

Can be helped by planning learning that	*Can help their own learning by*
Gives them an opportunity to think before they have to do something with information.	Putting time into study periods to reflect upon the learning and what questions might be asked.

Extrovert

Can be helped by planning learning that	*Can help their own learning by*
Involves team and group work.	Putting together small a small group to study together.

Introvert

Can be helped by planning learning that	*Can help their own learning by*
Involves individual work.	Setting up a quiet space for them to do their studying in.

Sensing

Can be helped by planning learning that	*Can help their own learning by*
Considers details and facts. Provides material that can be learnt directly.	Placing new knowledge into real-world contexts they may have experienced themselves.

Intuitive

Can be helped by planning learning that	*Can help their own learning by*
Involves discovery, exploration or experiment. Being offered a variety of strategies.	Re-representing things to be learnt as a pattern of interconnections.

Thinking

Can be helped by planning learning that	*Can help their own learning by*
Is objective and rational.	Looking for the rules that govern the situation they are considering.

Feeling

Can be helped by planning learning that	*Can help their own learning by*
Is placed into an emotional or human context.	Considering how the material to be learnt affects them or other people.

Judging

Can be helped by planning learning that	*Can help their own learning by*
Has clear tasks with deadlines.	Careful time management, setting themselves personal deadlines. Using Gant charts and dealing with learning as a sequence of projects.

Perceiving

Can be helped by planning learning that	*Can help their own learning by*
Enables individual strategy for discovering solutions or ideas.	Looking for other ways in which the learning might be useful.

Conclusions

It can be seen that all these learning style preferences are clusters of overlapping continuums. As a consequence the learners and the teacher in any given class will represent a wide variety of selections from the possible pool of preferences. It is also unclear as to how fixed these preferences are – whether they adapt over time given different learning environments or even whether they have some variation across individuals when approaching different subject disciplines (anecdotally I am aware that I will learn in a different manner if I am less comfortable with a subject area than if I feel confident with aspects of the material already).

One of the key elements of the ASSIST model (as highly regarded by Coffield *et al* 2004) is that of *Deep Learning*. It is imperative that whatever else we do to ensure that learners feel comfortable in our learning events that we must ensure that they have *ownership* of the learning. Factors that encourage this intrinsic motivation to learn include:

- A connection with real world problems,
- The incorporation of, and building on, of students' prior and current experiences,
- Elements of student choice and independent learning,
- The idea that all knowledge is valued,
- Opportunities for collaborative learning,
- Learner interaction,
- Opportunities for reflection,
- Clear and realistic tasks and timescales.

Just looking at this list will remind the reader of many elements of the learning style support tables in the previous section.

Learning is a complex process and it is very easy to make it hard for some all of the time. A competent deliverer of learning won't necessarily enable every sort of learning in every learning event. However over a sequence of such events they will provide opportunities for the majority of the learners to undertake learning in a style that fits in with their comfort zone. In addition educators need to help learners understand their learning needs and how they might provide themselves with the opportunities they might need to ensure they maximise their learning.

Learning styles are not about labels, but about knowing yourself and understanding how to help yourself learn. As Hall says in her summing up of the Coffield *et al* research:

> *"By offering learners a vocabulary for understanding both how they learn and why they learn more effectively in different contexts at different times, learning styles may help students to become more autonomous, more motivated and more likely to continue 'learning to learn'." (Hall 2004)*

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Appendix A

Summary table: some key points from the evaluation of 13 learning styles instruments

Theorist Instrument	Instrument independently assessed as reliable and valid Score out of 4 criteria	Positive implications for teaching and learning	Potential drawbacks	Evidence of impact
Gregorc • Mind Style Delineator	1	• Teachers need to understand own and students' learning styles	• Matching does not develop a range of skills or encourage other preferences	• Some evidence of Mind Style correlating with subject choice
Dunn, Dunn and Price • Learning Style Inventory • Productivity Environmental Preference Survey	0	• Teachers need to diagnose student preferences and match environment, resources, curriculum design and instruction • Students experiencing difficulties need alternative experiences rather than negative labelling	• Statements of preferences can lead to generalisations and labels which limit students' development	• Matching is not proven to correlate with motivation and achievement
Riding • Cognitive Styles Inventory	0	• Teachers should make demands on inductive/deductive reasoning and visual/verbal forms of expression	• Cognitive styles seem difficult to change, with possibility of labelling	• Little evidence that matching improves outcomes
Apter • Motivational Style Profile	1 3 unresolved	• Reversal theory enables us to analyse fluctuating changes in motivation and orientation	• This model is a personality theory, whose application specifically to learning is as yet under-researched.	• None in educational settings
Myers-Briggs • Myers Briggs Type Indicator	2	• Can encourage 'best-fit' career advice	• The relationships between elements and scales – 'type dynamics' are very complex	• Little evidence of correlation between type and achievement
Jackson • Learning Styles Profile	0	• Feedback (Jackson) is non-labelling and promotes positive approaches to new learning	• Jackson's ideas yet to be empirically substantiated	• None
Kolb • Learning Styles Inventory	1 1 unresolved	• Teachers and students should diagnose learning styles, according to subjects, and respond with differentiated techniques and activities	• The notion of the learning cycle may be flawed • Conceptual development of experiential learning is needed	• Findings are contradictory and inconclusive
Honey and Mumford • Learning Styles Questionnaire	1	• Used as a starting point for discussions to develop under-utilised styles	• The model's constructs have been heavily criticised	• There is no evidence of impact on achievement
Allinson and Hayes • Cognitive Styles Analysis	4	• Differences in learning style can be stimulated in management roles so that productive use is made of differences	• This model is under-researched in educational contexts	• None
Herrmann • Brain Dominance Instrument	2 2 unresolved	• Students with different learning styles can learn from one another	• This model is under-researched in educational contexts	• None
Sternberg • Thinking Styles Inventory	0	• Need for teachers to be aware of the styles they encourage or punish	• This is a metaphor rather than a theory	• Mixed results from studies in the USA and China
Entwistle • Approaches and Study Skills Inventory for Students	2 1 unresolved	• Inventories are diagnostic tools which give students and teachers a useful vocabulary to discuss effective / ineffective approaches to study	• The model focused is on Higher Education and not all contexts enable course designers, teachers and students to design courses and strategies	• It is not tested as a basis for pedagogical interventions
Vermunt • Inventory of Learning Styles	3	• Motivation and approaches interact in complex ways, so that consistency and variation co-exist	• Teachers need a sophisticated understanding of both the model and theory	• It is not a strong predictor of learning outcomes

Source: Hall 2004:50