Structuring Learning Structured Multisensory Input

1.1



Notes:

1.2 FILTERING INFORMATION



Notes:

This lecture considers how we are programmed to absorb information and how we can adapt our teaching support strategies to maximise their benefits for learners. We start by looking at how understanding is possible.

Understanding is a filter Studies of the human brain's attentional systems have shown that paying attention means that we select certain information as important: we give priority to that information over the other thousands of things bombarding our senses (James, 1890). So, the brain filters the information we take from a situation: it selects and structures what we can draw from an experience. Transferring this to a learning situation how can we be sure that the learner can automatically preselect the items that are important to that particular learning context?



1.3 NOT JUST MULTISENSORY ...



Notes:

Almost a hundred years ago, the educational philosopher Dewey explored the nature of learning and more particularly, learning from experience. He says:

"An experience may be immediately enjoyable and yet promote the formation of a slack and careless attitude; this attitude then operates to modify the quality of subsequent experiences so as to prevent a person from getting out of them what they have to give. Again, experiences may be so disconnected from one another that, while each is agreeable or even exciting in itself, they are not linked cumulatively to one another. Energy is then dissipated and a person becomes scatterbrained. Each experience may be lively, vivid, and "interesting," and yet their disconnectedness may artificially generate dispersive, disintegrated, centrifugal habits. The consequence of formation of such habits is inability to control future experiences" (Dewey, 1938/1997, p. 26).

What Dewey captures here is the essence of why a learning situation being 'multisensory' just isn't enough – too much visual input, too much noise, too much movement can be counter-productive. Dewey could see the importance of structure and cumulative practice to educational experience, that it is the combination of structure and multisensory input that *holds the key: each needs the other*.



1.4 AN EVOLUTIONARY PERSPECTIVE



Notes:

This makes sense if we take an evolutionary perspective on how we survive and thrive.

Perhaps the purest example of this would be hunting (something that is metaphorically involved in all learning, as we have targets – things we are pursuing – in order to gain something which we consider important or useful):

"We live in a multisensory world in which we are continuously deluged with stimulus input through multiple sensory pathways. For effective cognitive functioning, we must continually select and appropriately integrate together those inputs that are the most relevant to our behavioural goals from moment to moment. Thus, the dynamic and bidirectional interplay between attentional selection [structure] and multisensory processing is fundamental to successful behaviour" (Talsma, Senkowski, Soto-Faraco & Woldorff, 2010, p. 408).



1.5 LEARNING AS A CONCERTED WHOLE

Notes:

There are two ways in which the concept of structure is involved in fostering effective



learning. They are interconnected, but it is worth mentioning them separately.

The first aspect of 'structure' encompasses how learning experiences and events are designed: how we shape the delivery of syllabus content with thought to the use of routines to structure and reinforce learning, the use of cumulative practice and the way in which different forms of information are delivered simultaneously, in other words timing the release or planning exactly when attention is to be paid to information. It is attention to these sorts of factors that organises learning, making productive links possible. Think of the myriad of ways structured practice and the focus of attention play in an orchestral performance (... the cumulative practice to gain instrumental expertise, the cumulative practice in reading music, the listening to other orchestra members, the watching of the conductor...(Think back to Dewey's quote – he highlights learning as essentially drawing productively from the experiences offered/available).

1.6 UNDERPINNING LEARNING



Notes:

The second aspect of structure regards the internal structuring of the subject matter we deliver. A 'structured' programme means rather more than that it has a specific organisation. A scheme of work that is structured should provide a framework within which the different parts cohere and contribute to a planned whole (Hornsby, nd; Skemp, 1989; Mellin-Olsen, 1981). This means that there is an inter-relationship between the parts of the framework that can be reflected upon and used to promote relational understanding. Relational understanding makes facts and procedures easier to remember because "knowing how [facts] are inter-related enables one to remember them as part of a connected whole... being able to relate tasks to the structure makes them meaningful: part of a familiar picture ... it fosters the ability to generalise and thus grow as a problem-solver" (Skemp, 1989, p. 10; Mellin-Olsen, 1981) or as a reflector upon information. In language learning this growth of understanding in the connectedness of units of language and the development in the learner of an ability to manipulate these units leads to progress not only towards competence in literacy skills, but in the longer term in literary skills and in the learner's ability to self-teach and



positively influence his or her own academic development (Share, 1995, 2008; Valtin, 1997).



1.7 MEANING: THE POWER OF INTEGRATION

Notes:

Structure is a key aspect here as it is the means by which learners can link and create fresh meaning because it provides the framework within which learners can generalise. Think of a mobile phone, if fitted together correctly a selection of components creates an extraordinarily powerful tool that makes an amazing transportation of sound and visual information possible across vast distances. Skemp (1989b) talking forty years ago used the metaphor of a 'wireless' radio when talking about the teaching of mathematics within a structured framework and how this compared to rote learning methods. Skemp says "... the difference between a mathematical structure and a collection of isolated facts is as great as the difference between a radio and a box of bits..." (p. 4).



1.8 STRUCTURE SUPPORTS RETENTION IN MEMORY

Notes:

Structure is also crucial as it supports memory. How information is filtered influences which information is selected for further processing and which is dropped. If you don't understand what you are doing then you don't know what is relevant and what is not... and this tends to be a great burden that leaves learners with working memory weakness, such as is commonly found in dyslexia, struggling to perform certain sorts of task effectively (Vogel, McCollough & Machizawa, 2005; Conway, Cowan & Bunting, 2001). So, we need to help learners to reduce their memory burden by teaching for understanding (what's known as relational understanding) rather than mere fact retention. Learners of all ages need to know both what to do and why, as this is what makes learning powerful and productive. It is here we need to scrutinise our own practice: how much of what we do is in the opposite of this? How much of what we do is fact emission and practice designed to promote isolated fact retention, what Skemp called 'instrumental tuition'?

Examples of instrumental tuition are aspects of learning support that are based on a rule or 'trick' that gets a learner over a small hurdle (potentially) but does not promote understanding or improve generic skills in the subject matter. Skemp says: "I would until recently not have regarded [Instrumental understanding as] understanding at all. It is what I have in the past described as 'rules without reasons', without realising that for many pupils and their teachers the possession of such a rule, and ability to use it, was what they meant by 'understanding' "(Skemp¹, 1976, p. 2/86).

1. The first page numbers refer to the original article, the second to the articles place in the 2006 reprint that you are directed to in the References section.

1.9 CATEGORISATION: THE HEART OF UNDERSTANDING AND ACTION

(Drag and Drop, 10 points, 2 attempts permitted)



Notes:

It is the structure that we bring to multisensory interactions that give them their power. This takes us back to Dewey's point about making learning cumulative and structuring events so that the learner can develop constructive habits of thought that give him or her greater control of the process of learning. By analogy, consider how compiling a mind-map or other structured representation of ideas enhances understanding of the interconnections between the different aspects of the subject matter – sorting means categorising and effective categorising is the essence of all understanding and successful actions.

1.10 SUMMARY EXERCISE



1.11 Question 1

(Multiple Choice, 10 points, 1 attempt permitted)





1.12 Question 2

(Multiple Choice, 10 points, 1 attempt permitted)



1.13 Question 3

(Multiple Choice, 10 points, 1 attempt permitted)



1.14 Question 4

(Multiple Choice, 10 points, 1 attempt permitted)





1.15 SUMMARY RESULTS



References

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