

CONSIDERING VISUAL LITERACY WHEN DESIGNING INSTRUCTION

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Introduction

Technology has made it increasingly easy to include imagery into printed and online teaching materials, yet it seems that less imagery is used, not more. A recent survey conducted on a limited number of teaching materials, produced by one of Australia's leading distance education universities, found that over 87% of these materials contained no photographic image, while 58% contained no form of illustration or image of any description. The intention of this paper is to draw attention to the need to use images in teaching materials, both to aid and enhance the learning process. This issue will be investigated in relation to:

- Communication in today's culture
- Cognition and retention
- Analogy, Metaphor and Metonym
- Visual literacy
- Enhancement of educational materials
- The appropriate response of educators

Particular attention will be paid to materials used for distance education (DE) where face-to-face interaction between students and teaching staff does not occur. This paper suggests that not only is the use of images in training materials necessary, but has become almost mandatory in a culture with increasing visual orientation. Literacy in the future will include the ability to read both text and image, together and separately. The creative use of images in story telling, communicating concepts and as a means of providing evidence, is no longer an added extra for a text, but a vital link in the cognitive processing of information and essential in the creation of sound pedagogy.

Communication in Today's Culture

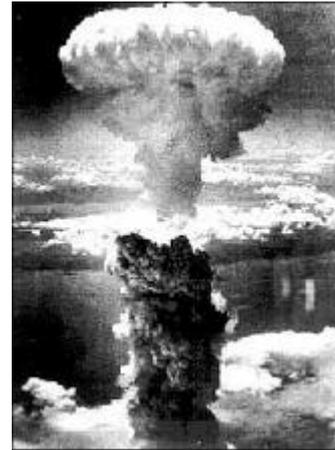
Communicating with images is an ancient concept. Early mankind discovered in their ability to make pictures, a method of visual awareness through symbolisation which differs in important respects from any other symbolic method that is known (International Visual Literacy Association 2001). Clearly, society has advanced, having created very sophisticated communication devices, including newspapers, television and extensive computer networks.



Cave Drawings from Chauvet

This concept of communicating with images is familiar to educators. Griffin and Schwartz (1997) state that, 'by the mid-1980s the notion that images are more potent than words, and that given a lack of congruence between visual and verbal information the visual will win out, had been repeated often enough to become accepted wisdom' (p. 40). Accepted, yes, but not necessarily acted upon.

Where it may appear therefore that students attending university directly from school are more illiterate than their predecessors, perhaps their learning styles/preferences do not match the teaching style of the traditional university. Griffin and Schwartz continue by stating that, 'While young people today may be less inclined to read and thus less verbally literate than the previous generations, it has become a cliché that they are more visually facile and skilled. This increased visual literacy is attributed to children's copious exposure to and experience with television,



The words 'Atomic blast' by themselves may mean very little but the inclusion of an image automatically brings further meaning to them

Image accessed from:
<http://www.rockingham.k12.va.us/EMSWWII/WWII.html>



Mary-Beth playing computer games with her brother. Accessed from:
<http://bill.howerton.com/marybethrecent.htm>

video games, and computers' (p. 41). The most important aspect here for educators is to present material in a way which encourages sufficient retention of information to facilitate satisfactory learning in a culture that over recent decades has changed considerably.

As today's Western culture is predominantly guided by a visual paradigm (Schirato & Yell 1996, Jenks 1995) the trend toward visual awareness becomes more than a matter of personal preference. Traditionally though our

society has placed high value on the word, both written and spoken, but new technologies have helped to emphasise the importance of other means of communication (Morgan & Welton 1992). Visual genres and mediums now dominate communication; photographs, television, film, video, the internet, cartoons, posters, t-shirts, comics, multi media presentations and computer simulations. Therefore, 'increasingly, an argument can be mounted that a literate person in contemporary western cultures is, first and foremost, someone who is able to recognise, read, analyse and deploy a variety of visual genres and mediums' (Schirato & Yell 1996, p. 209).

In contemporary western culture, particularly the youth culture, visual mediums and genres are becoming increasingly popular at the expense of other mediums, in particular the written word (Schirato & Yell 1996). Morgan & Welton (1992) suggest that the constant bombardment of visual images from so many quarters is 'already shaping their [the youths] lives, influencing their attitudes, tuning their responses' (p. 4). As media simulations become more popular and pervasive they will increasingly encroach upon life experience to

the extent that new senses of reality will be formed and media representations will in fact become our 'first order reality' (Walker and Chaplin 1997 p. 23). In support of this view Muffoletto (2001) sees this as being part of a major culture shift when he writes:

As the technology of representation proliferates and, as a result, our understandings of reality change, we need to consider such new literacies (if, indeed they are new, and not simply traditional literacies in different clothing) in light of questions of meaning construction and power (p. 8).

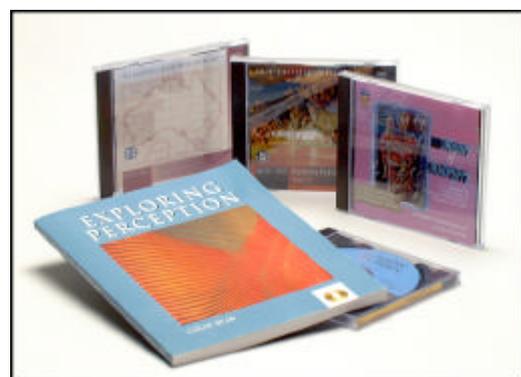
It is important to note that Western cultures are becoming predominantly 'visual cultures'. Therefore, new consideration of cultural literacy (Schirato & Yell 1996) and the way in which society approaches the visual mediums will need to be given strong consideration, particularly among educators. It is reasonable to presume, as do Schirato & Yell (1996), that 'contemporary western subjectivities are increasingly being produced in and negotiated through [images] visual texts' (p. 223). To understand the nature of representation and how society is utilising imagery, this must be seen in relation to wider changes in social processes (Muffoletto 2001). If this is the case, educators can no longer ignore this trend. Instructional designers and subject specialists need to be constantly reviewing their approach to the design of learning materials, particularly materials designed for those entering higher education directly from secondary school.



Instructional designers and subject specialists need to be constantly reviewing their approach to the design of learning materials

Well over a decade ago British scholars were calling for heightened attention to the whole area and impact of 'visual literacy' and the reading of meaning in complex symbol systems beyond our use of alphabetic script (Heath 2000, p. 123). There was also a surge of interest in studying a major decline in the literacy rates of school leavers. Interestingly, Knupfer (1993) notes that this 'decline dovetails with the decline of narrative forms and the rise of visual technology' (p. 154).

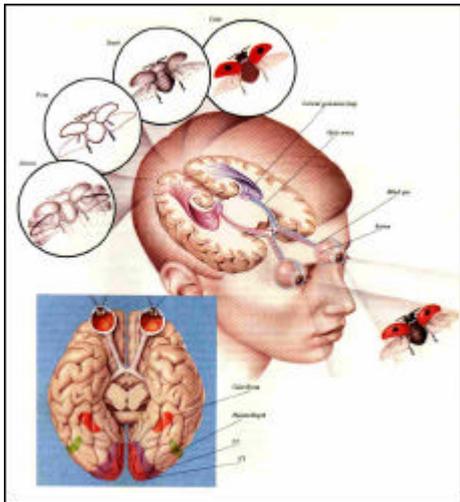
This is demonstrated very clearly in a shift in emphasis by major textbook publishers, who, anticipating this cultural shift in learning preferences have vigorously moved into multimedia markets, aggressively pushing CD-ROM texts that provide instant access to picture, photograph and chart, as well as word, therefore covering many aspects of the educational spectrum (Knupfer 1993). Although the book is likely to remain a major instrument of education and knowledge transfer for generations to come, technology based on visual literacies will provide information that print media cannot deliver (Rogalin 1997, p. 866). It can be said therefore that



CD based and CD supported teaching materials

the vast number of contemporary visual mediums have gained very high levels of pedagogical credibility. As a preferred means of communication they can reproduce reality in an objective way (Schirato & Yell 1996, p.209). It is precisely this reproduction of reality that can aid cognitive processing and the creation of knowledge for students.

Cognition and Retention



An image is defined as endowing an optical sensation with meaning

It is through the senses that we interact with, and learn about, the world around us (Walker & Chaplin 1997 p.19). In particular, some people remember better what they see rather than what they hear, and 'if there is emotion involved, the memory is enhanced even more' (Swetmon 1998, p.7). If memory is enhanced, knowledge can be retained. Once cognitive processing of knowledge has taken place learning is deemed to have occurred (Morgan & Welton 1992)

A person's learning style is made up of a combination of how he or she perceives, organises and processes information

(DePorter 1992). It is also known that individuals have different sensory preferences or cognitive styles, and that learning is more effective when multiple sensory channels are involved (Kearnsley 2000). DePorter (1992) identifies these differences in learning styles or modalities as visual, auditory, and kinesthetic (V-A-K). Specifically, visual people learn through what they see, auditory learners from what they hear, and kinesthetic learners from movement and touch. DePorter goes on to say that, 'Although each of us learn in all three of these modalities to some degree, most people prefer one over the other two' (p. 112). When there is a mismatch between cognitive style and the mode of presentation, it is argued that performance is deemed to be reduced (McKay 1999, p. 324). One of the most basic problems, as DePorter (1992) points out, lies in the fact that 'many people don't even realise they are favouring one way or the other, because nothing external tells them they're any different from anyone else' (p. 114).

Consequently, many students struggle with the text based learning materials provided by many universities. It is this fundamental area of sensory preference that instructional designers should give greater credibility to. Gunawardena (1992) observes that, instructional design (ID) must address the complex inter-relationships between learning task, learner's cognitive processes and media attributes. Some students are therefore less likely to comprehend teaching materials presented by the more traditional, text based method.



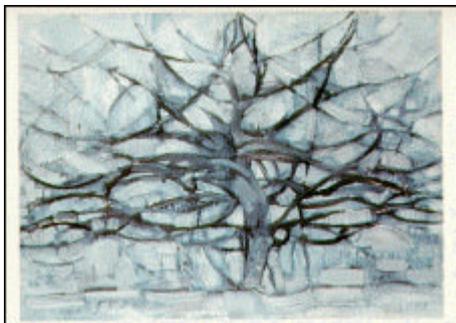
Many students today struggle with text based learning materials

DePorter (1992) reports that, an awareness of these different learning styles has helped teachers reach

the majority, if not all, of their students by presenting information in several different ways (p. 110). Consequently 'a few well -chosen and -executed illustrations can economically and powerfully convey a wealth of meaning' (Knupfer 1993, p. 150).

Analogy, Metaphor and Metonymy

Analogy, metaphor and metonymy help illustrate abstract concepts and the creation of mental images for the learner. These tools are not utilised to simply increase the aesthetic appeal of materials (which may be considered an added bonus). Rather, they are added to make the materials more pedagogically sound. Meaning is ascribed to a text as the student interacts with it (Muffoletto 2001, p. 6). Allowing students to create meaning from observations is an essential feature of cognition, and analogy is one of the most fundamental aspects of human cognition (Messaris. 1997). Viewers respond to the abstract



P. Mondriaan, *De grijze boom*, 1912
Viewers responding to the abstract features of this visual composition would undoubtedly see a tree

features of visual composition as unconsciously perceived analogies of their real-world experience. Meaning is given to an image as a student interacts with it. The visual interpretation of these representations is described as abductive (Moriarty & Kenney 1997) in that it begins with observing clues in the visual (perception) and moves to a conclusion by hypothesising relationships and patterns (cognitive, convention) through massive parallel processing. This process of abduction within the learner 'builds on natural

perception at both the iconic and indexical levels and sets the stage for more complex forms of cognitive and conventional processing needed to make sense of symbolic visuals' (Moriarty & Kenney p. 238).

Presenting a photograph of a piece of machinery to illustrate its appearance is fine in itself, but images can also be used to illustrate subjective or abstract concepts to arouse emotion. Morgan & Welton (1992) note that you cannot make a picture of the feeling 'comfort' but, 'you can, however, make a list of the objects which produce that sensation – fire, slippers, armchair, and so on. By doing this you are using metonymy' (p.109), or using the attribute of something to convey meaning, rather than trying to represent the thing itself. It may also be used to represent a cause by using an object to represent the person or organisation (Morgan & Welton). This is possibly due to the fact that visual texts, primarily photographic, constitute, and are usually read as, narratives. Schirato & Yell (1996) support the use of metonymic images to convey the narrative when they write:



Wallace gets comfortable and awaits the arrival of his warm slippers Accessed from: <http://www.alphalink.com.au/~sedmonds/wg/twt/images>

The choice and arrangements of objects and the use of space in the visual text are all potentially meaningful, and when those meanings are brought together or integrated (either through reference to a single image or multiple images) we have a narrative (p. 219).

By creating a narrative or story, from an image, the learner can create a meaningful relationship with it, which in turn affects cognition. In other words, a picture paints a thousand words.



A child's picture painting a thousand words

Similar to the use of metonymy is the use of metaphor. Morgan & Welton (1992) describe the Metaphor as 'the use of a physical object to represent an abstract idea or emotion.

This depends upon a more or less conventional link between the connotations of the object and those of the idea' (p. 105). Heath (2000) believes that what amounts to visual perception carries meaning because 'the imagistic character of neural activity manages the link up with stored experience that gives coherence and embeddedness to primary sensory images' (p. 122). Images



Unemployed youth

therefore can be used to illustrate abstract concepts simply by showing the effects of the concept. For instance, being unemployed is not something that can be portrayed directly, but a photograph of a person looking miserable and idle, evidenced in their posture, along with appropriate facial expression and dress, can signify the economic condition which produced it (Morgan & Welton 1992). Again, simply put, it would seem that seeing and attending to specific features within images can engage the learner in recalling information that has been stored through prior experience and can now be articulated, if need be verbally (Heath 2000).

Just as 'visual imagery clearly forcefully reinforces the basic message' (Knupfer 1993, p. 149), so colour, form and line will ensure attention to perception and the engagement of the 'visual brain', which in turn resonates with remembered experience and results in linguistic representation. Therefore the image will allow for a 'sustained and adaptive learning environment necessary to increase learning potential' (Heath 2000, p. 123). It is important to apprehend these concepts and utilise them to their full extent. To do this effectively there is a need to investigate what it means to be visually literate within the context of current ID practice. Further, It is suggested that the opportunity to facilitate higher learning by using the tools of analogy, metonym and metaphor should not be ignored.

Visual Literacy

Broadly defined, 'literacy' includes more than the ability to read and write. 'It connotes an ability to decode and communicate information in a form that can be decoded and communicated by other individuals in a respective community' (Rogalin 1997, p. 865). Conventional notions of literacy, as related to education, have tended to emphasise the value of verbal and written, rather

than the visual mediums of communication and representation. Schirato & Yell (1996) state that ‘contemporary western cultures, and the communication practices that characterise them, are making increasing use of visual mediums and genres’ (p. 232) particularly in relation to literacy.



Combining 3 images to create the idea of chatting on the internet

Further, literacy is not simply understanding the grammatical rules of language. Instead, ‘it refers to a connection between the recognition, production and retrieval of what is constituted as information on the one hand, and its use or deployment as a communication practice on the other’ (Schirato & Yell 1996 p.208). Muffoletto (2001) believes that:

Like texts, visual representations (visual texts) are the result of ideologically formed intentional acts. The image, then, as a result of an intentional act (either internal or external) is better understood as a text to be read, a constructed message (p.2).

Therefore, anything that passes on information or meaning could be classified as literacy. It should also be seen that the opposition between words and images implied by the difference between literary and visual literacies needs to be questioned and put into context. Thanks to the exposure of societies to mass media most adults possess some measure of visual literacy already (Walker & Chaplin 1997)

It is even possible to further extend the semantic reach and use of images into domains that formerly were the exclusive province of language. Kress & van Leeuwen (1996) suggests that ‘this has already been done, on a small scale, in places where people are unlikely to have any given language in common’ (p. 130). Images, particularly photographs, are thought to be easier to assimilate and to be more universal than words (Walker & Chaplin 1997, p. 113). This issue alone could have a major impact on the international trade in education, for as Morgan & Welton (1992) point out, ‘International trade puts a premium on any method of communication which can reduce dependence on expensive and sometimes confusing translations of the written word’ (p. 3). Therefore, if images can be produced with characteristics common to many cultures, more effective inter-cultural communication and knowledge transfer can take place.



Using of body language for instance

If images are going to be produced to support learning in this way, those making images will need to have a clear understanding of what message need to be conveyed and their cultural implications. For it has been seen that when images eventually come to be read, the reader will be ‘considering the intentions of the maker, applying systems for thinking and rethinking one’s options, and acquiring a body of information to support conclusions and judgments (Yenawine 1997, p. 845). As the target groups of this visual

information become more skilled in receiving, understanding and reacting to this visual information, so the quality or effectiveness of communication is improved and the subtlety of the messages can be further developed (Morgan & Welton 1992).



An image to illustrate the concept of cloning

It is therefore incumbent on educators to ensure that learners are given the greatest possible chance to assimilate knowledge by as many routes as possible. It is believed by Kress & van Leeuwen (1996) that visual communication is coming to be less and less the domain of specialists, and more and more crucial in the domains of public communication. They state that inevitably 'this will lead to new, and more rules, and to more formal, normative teaching. Not being 'visually literate' will begin to attract social sanctions. 'Visual literacy' will begin to be a matter of survival, especially in the workplace' (Kress & van Leeuwen 1996, p. 2-3). As education no longer simply caters to the elite but is more so for those with a desire to learn, the appropriate response of educators is to apprehend these notions, and provide as many avenues as possible for the transfer of information.

Enhancement of Educational Materials

Having discussed visual literacy in relation to other forms of literacy, and the use of images in the cognitive processing of information, other advantages of using images to enhance teaching materials will now be considered. A number of scholars believe that pictorial representation is simply a natural process that uses inborn perceptual processes to generate meanings (Moriarty & Kenney 1997). Moriarty and Kenney believe that people make these connections by seeing resemblances that are not arbitrary, but natural. They write, 'Even though there is a learning process, it involves perceptual experiences rather than social or cultural conditioning' (p. 237). This happens by images providing mental pictures for those who are unable to create images for themselves.



Public relations is not just the responsibility of one or two people, it is the responsibility of every member of the organisation.

Solomon (1983, considers that this visual 'supplantation' is most important and observes that it does facilitate higher learning. Visual images also provide a great deal of information in traditional instruction, allowing learners to see what might not be evident in textual explanations (Smith & Blankinship 2000, p.

750). Unfortunately, the comprehensive use of images has only occurred in a relatively narrow band of disciplines.

Developing visual skills opens a range of pleasurable experiences that are denied to those who perceive visual media in simple, narrow terms (Morgan & Welton 1992, p. 2). This provides many opportunities for students to pose questions and reflect on behaviours and processes. Photographic



This famous image of a girl running from her village during the Vietnam war, having just been napalmed, was largely responsible for changing public sentiment to the war in the US

representations are historical records, and viewing these moments in time can not only be an enjoyable learning experience, but will often illustrate points that textual media cannot (Smith & Blankinship 2000). Further, Moriarty & Kenney (1997) tell us that 'the representational conventions of images, unlike those of language, are typically based on informational cues that people learn to deal with in their everyday encounters with their real visual environment' (p. 238).

Therefore, the image must be seen as a constructed text to be read by others, so that the learning process may be better informed (Muffoletto 2001). The value of photographic representation therefore lies in the discovering of truth about external realities and is encapsulated by the old saying 'seeing is believing' (Walker & Chaplin 1997 p. 19).



That same child now grown up with her own child

Muffoletto (2001) also believes that images are more than simple representations or illustrations, they are stories that are constructed through codified systems of representation. He writes that:

Existing somewhere between the constructed image and the historical and social reality of the reader is the meaning of the image-text. Reflective visual literacy, as a construct for understanding and producing visual texts, empowers the reader as well as the author in understanding the power of the image as a social artefact (p.7).

Developing a sophisticated understanding of the nature of visual communication is therefore essential to critical media consumption and in the design of meaningful DE materials.

Visual mediums are clearly different from other communication mediums. Schirato & Yell (1996) believe this is 'because their materiality produces a different kind of relationship between the medium and its audience' (p. 218). One reason pictures are remembered so well is that they have distinctive features which attract attention, allowing them to be perceived and therefore encoded with meaning, which 'may be represented in terms of both a visual code and a semantic code' (Bernstein et al. 1991, p. 315). This suggests that information is remembered better when it is represented in both codes rather than in only one. Swetmon (1998) state that the addition of visuals to a

presentation 'will almost guarantee a better retention of the material by the average audience' (p. 8).

As different perceptions of realism seem to exist side by side in our society, 'the dominant standard by which we judge visual realism and hence visual modality remains for the moment, naturalism as conventionally understood, photo-realism' (Kress & van Leeuwen 1996, p. 163). Despite the fact that images are two- rather than three-dimensional, and therefore reductive in terms of the information they supply, compared with perceptions of reality, these representations of reality are not as arbitrary as words (Walker & Chaplin 1997). For instance 'no verbal or written description can totally replace the visual experience of seeing a dress, a movie, etc' (p. 53). It has been found, for example, in DE and particularly online DE materials that 'the presence of a photograph [of participants] prior to and during computer conferencing has positive effects on intimacy/affection and social attractiveness' (Walther, Slovacek & Tidwell 2001). It has also been found that pictures, particularly static pictures, are much easier to write about, as 'the details that constitute them, and the contexts they are involved in, are easier to identify and reproduce' (Schirato & Yell 1996, p. 226).



Images may be used in computer conferencing to give a sense social presence.

The final point in this section is that, 'visual representations differ from perceptions of nature by being intentional, encoded communications, and by being representations of something' (Walker & Chaplin 1997, p. 23). Thus, Jenks (1995) believes the manner in which the concept of an idea is understood 'is deeply bound up with the issue of appearance, of picture, and of image'. As the Austrian-British philosopher Wittgenstein (cited in Jenks 1995, p. 1) declared, 'a picture is a fact' and 'a logical picture of facts is a thought'. Walker & Chaplin (1997) consider that 'every representational image provides a viewing or vantage point for the spectator to occupy' (p. 100). It is therefore possible for educators to forge a conscious recognition of the constructive relation between societies visual practice and its visual culture (Jenks 1995).

The Response of Educators

It is imperative that educators embrace the concept that the use of the visual metaphor is now the predominant communication tool. As discussed, being visually literate is concerned with 'the construction of meaning, the construction of sense, the telling of stories by authors and readers. Educators need to be concerned with the official stories being told' (Muffoletto 2001, p. 7). Unfortunately, in most university classes very little visual information is presented, students mainly listen to lectures and read material written on chalkboards and in textbooks and handouts (Flood & Lapp 1997). Or, in the case of DE, interact with study books or computer screens that contain very few visual references. Felder & Soloman (2001) suggest that most people are visual learners, and that if sufficient visual content was included in learning

materials students would retain more information. Sadly, as Flood & Lapp (1997) assert:

The education systems of modern complex societies typically stress limited ranges of the visual and communicative arts as appropriate display forms and give highest status to the printed word, notably to students' handwritten verbal representations of their knowledge (p. 344).

Spender (2000) believes the reason for this is simple and can be traced to the fact that:

Teachers today are reared on print. Textbooks as well as blackboard notes, essays, examinations have been the medium for learning. So fundamental has the print been that anyone who couldn't get the hang of it – who couldn't become literate – basically failed education (p. 10).



Texts in primary school are well illustrated

Interestingly, texts produced for the early years of schooling are richly illustrated, but as students progress to the later years of high school visual images give way to a greater proportion of verbal, written text (Kress & van Leeuwen 1996). One survey of hundreds of upper secondary texts, spanning the entire century, discovered that 'only the science books—especially zoology, botany and biology, with the emphasis on anatomy—innovated in any serious way in the incorporation of illustrations into the text' (Knupfer 1993, p.149). It should be noted that the survey of DE materials (mentioned at the beginning of this paper), had exactly the same outcome. One would have to question why this is the case.

Kress & van Leeuwen (1996) believe that the fading out of illustrations in student texts is not a simple, straightforward, devaluation of visual communication. Rather it is 'a valuation which gives prominence to one kind of visual communication, writing, and to one kind of visual literacy, the old visual literacy' (p.15). Opposition to the emergence of a new visual literacy is not based on an opposition to visual media *per se*, but rather 'an opposition to the visual media in situations where they form an alternative to writing and can therefore be seen as a potential threat to the present dominance of verbal literacy among elite groups' (Kress & van Leeuwen 1996, p. 16). Spender (2000) suggests that there are many educationalists who are horrified by these thoughts, and would see any addition of pictures to learning materials as 'dumbing down' academic content. Kress & van Leeuwen (1996) take this thought further when they write:

The move towards a new literacy, based on images and visual design, can come to be seen as a threat, a sign of the decline of culture, and hence a particularly potent symbol and rallying point for conservative and even reactionary social groupings (p.15).

Simply recognising another person's preferred learning modality is the key to making ones presentations even most effective (DePorter 1992, p. 122), and should not be seen as posing a serious threat to anybody. Muffoletto (2001) believes that, by understanding the process by which images become images,

that in turn represent or refer to the creation of meaning, is useless 'if teachers do not incorporate the notion of multiple perspectives into their daily pedagogy' (p. 7). DePorter (1992) states that, 'when you're aware of how you and others perceive and process information, you can make learning and communication easier' (p. 110). This would suggest that an effective instructional format would facilitate all cognitive styles, necessitating the introduction of visual texts/images (McKay 1999). Reigeluth (1983), suggested almost twenty years ago, that instructional practitioners have been slow to respond to an increasing need to make their methods of instruction more effective, efficient and appealing (McKay 1999). It could be assumed that this would be the aim of every educationalist.



Let's help them as much as we can

Conclusion

Students today tend to be more visual learners than in previous generations because their world is rich in visual stimuli (Owston 1997). It is therefore fitting that 'we design learning materials and opportunities that capitalise on what we know about how our students prefer to learn' (Owston 1997). It could therefore be concluded that a combination of visuals and text would achieve more effective learning outcomes. It is incumbent upon those who design teaching materials, particularly those designing materials with no other form of instruction, to take into consideration the changes occurring in our culture and particularly, in the learning styles of present day students. Focusing on the needs of the student and facilitating the best possible learning experience by utilising multiple communication tools, should lead, as has been demonstrated, to greater student satisfaction and possibly even better academic results.

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