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ENHANCING LEARNING AND COMPREHENSION THROUGH STRENGTHENING VISUAL LITERACY

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Living in an image-rich world, as we currently do, does not mean that individuals naturally possess visual literacy skills. This article explores the concept of 'visual literacy', and the skills needed to develop visual literacy and visual intelligence. Developing visual literacy in educational environments is important because it can contribute to individual empowerment, and it is therefore necessary to take pedagogical advantage of visual literacy's place across the disciplines. Doing this means tapping into experiences, expertise and interest in visual communication and building a new paradigm that takes visual education seriously.

INTRODUCTION

In an article published in 1983, Cassidy and Knowlton argued that the concept of and arguments for visual literacy mystify more than they clarify, and that those advocating visual literacy were being led away from, rather than toward, fruitful enquiry and meaningful practice. More recently, Beatham (2009) has written that educational technologies which include and rely on images and visuals and whose potential to enhance the learning experience is generally extolled, simply compound confusion unless learners are guided to develop their powers of observation, investigation and critical enquiry. Felton (2008) captures the current position:

> Living in an image-rich world does not mean students (or faculty and administrators) naturally possess sophisticated visual literacy skills, just as continually listening to an iPod does not teach a person to critically analyze or create music. Visual literacy skills can be learned in ways analogous to textual literacy. With training and practice, people can develop the ability to recognize, interpret, and employ the distinct syntax and semantics of different visual forms. The process of becoming visually literate continues through a lifetime of learning new and more sophisticated ways to produce, analyze, and use images. In this rapidly changing world, visual literacy, whether conceptualized as a distinct set of capacities or as part of a larger multimodal literacy, should be recognized among the fundamental goals of a liberal education.

This article explores 'visual literacy' and presents a rationale for including visual literacy skills development in formal education and in lifelong learning, as visual literacy and visual intelligence assist one in engaging purposefully with one's environment as scholar or as a local or global citizen.

LITERACY IN THE CHANGING COMMUNICATION LANDSCAPE

In current academic and colloquial discourse, a multitude of terms such as 'visual literacy', 'digital literacy', 'media literacy', 'cultural literacy', 'techno literacy' and, more recently, 'silicon literacy' and 'hypermodality' are encountered (Walsh, 2003). Such terminology reflects attempts to explain and understand literacy and learning within changed learning contexts and to establish new learning paradigms. Two of the most recent insights into the field of literacy are the ideas of 'multiple literacies' (*New London Group*, 1996; Street, 1995 Unsworth, 2001) (also referred to as 'multimodal' (Kress, 1997); or 'new' literacies (Lankshear & Knobel, 2003)) and 'literacy as social practice' (Street, 2003). Conventional understandings of literacy as reading and writing have been challenged and impacted on by technological developments, globalisation and increasing cultural and social diversity (*New London Group*, 1996). Emerging technologies are shifting ways by which meaning is being constructed and communicated and people, in addition to language, are using, inter alia, visual, audio, spatial and multimedia means to communicate and express themselves. Proponents of the multimodal literacy argument describe communication texts as those that have more than one mode of communicating, explaining that meaning is communicated through a synchronisation of modes, such as written language and images (still or moving) and may be produced on paper or electronic screen and may incorporate sound (Walsh, 2003).

The notion of multiple literacies has several implications for how we think about literacy and requires that we acknowledge that literacy encompasses ensembles of communicational modes other than language as speech or written text (Kress, 2000:142). In this environment, semiotic systems that employ symbols, colours, sounds and graphics are used to extend our means of communication (*New London Group*, 1996).

Literacy as 'social practice', as described by Street (2003), implies that literacy is not simply a technical and neutral skill; it is always embedded in socially constructed epistemological principles and is rooted in conceptions of knowledge, identity and being. Inherent in the idea of literacy as social practice is that different cultural and social groups have different ways of making and communicating meaning. Thus, in order to be literate, one needs to be competent in making meaning of various forms or modes of literacies constructed in various contexts by potentially divergent communicators (Harste, 2003).

It is within this context that the subject of the visual and visual literacy is further explored.

THE UBIQUITY OF THE VISUAL

Images are used to communicate, inform, persuade, influence and enlighten, and are an important part of the cultural and visual environment. This is not new. For example, ancient societies such as the Egyptians used pictographs, ideographs and determinatives (signs used to clarify meaning) in the way we use images and texts in various forms of contemporary communication in magazines, newspapers, textbooks, websites and multimedia (Veen, 1998) and we are aware that visual forms of communication preceded the written form.

An interesting observation by Schlain (1998: VII-IX; 5, 7) is that the transition from a visual society to one largely dependent on written communication was not without social upheaval. In his book *The alphabet versus the goddess: the conflict between word and image*, he writes

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that, where literacy and then alphabet literacy displaced iconic ways of representing the world, patriarchal social and political relations replaced the egalitarian relations that had preceded them. He hypothesises that thinking about the world and representing it through images, which is right-brain related, promoted and reinforced feminine values and therefore benefited women's social and political status. Conversely, thinking about and portraying the world by means of abstract concepts articulated in alphabet-dependent writing is left-brain related and promotes and strengthens masculine values, privileging men socially and politically. This hypothesis argues a link between masculine capacities such as objectivity and logical and abstract thinking (left-brain activities), and holistic thinking, imagination, demonstrative affectivity and understanding (right-brain activities), which are seen as feminine. It is not, it is argued, the dominance of specific brain or mind functions in themselves that bring about asymmetrical gender power relations in society, but the assigning of gender-related values to them. Related to these views is the argument that a complementary relationship between image and written word is conceivable and desirable, and that it has the potential to bring social benefits (Olivier, 2005:144). Should these arguments be valid, they would suggest that the current re-re-ascendance of the visual in communication and expression bodes well for societies fraught with social and gender inequities. Olivier's standpoint consequently strengthens the argument advocating the development of visual literacy and intelligence in educational and social institutions as a means of promoting a more balanced or equal society and also strengthens the argument for developing visual literacy and intelligence in order to recognise and accommodate the learning preferences of students that are inclined towards the visual, thereby advancing their purposeful engagement in the social environment. Paralleling this line of thought are the observations made by Street (2005), that literacy *per se* is social practice and that literacy text is not constructed or communicated outside of social or cultural context or external to conceptions of being and identity.

VISION THEORY 101

Burns (2006:16) describes the current landscape as an evolution from 'typographic' to 'graphic', or illustrative, human communication. That this evolution is in process is evidenced by the 1999 *Time* magazine article which reported that survey results indicated that the vocabulary of the average 14-year-old had dropped from 23 000 words in 1950 to about 10 000 words in 1999. This was taken to mean not that students are less articulate but that they communicate in a different and image-laden way (Ivery, 2000).

Two facts about the human eye and brain put the importance of visual literacy and visual intelligence into perspective. Ninety percent of the information that reaches the brain is visual; and the brain processes visual information 60 000 times faster than text (The visual teaching alliance, s.a.). A comparison between the speed at which the human ear and the brain can analyse data indicates the extraordinary ability of the eye and brain to acquire and process information:

> The auditory nerve transmits sound to the brain and is composed of about 30 000 fibres. Contrast that with the optic nerve which transmits visual signals to the brain through 1 000 000 fibres. Basically, you've got a dial-up connection from the ear to the brain and broadband from the eye to the brain (Burmark, 2002).

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In making meaning of visual information, the brain first perceives boundary contours. According to vision theory, once the brain has perceived the edges it then fills in the details. This ability is critical to the simplest perceptions (Barry, 1997:26-27). The brain's tendency to 'create' a reality was used by the Impressionist and Pointillist painters of the 19th century, well before perceptual psychologists had articulated their theories of perception and vision (Barry, 1997:48).

Vision theories remind us that perception is based not on direct contact with the environment, but on the brain's contact with electrical signals that represent the environment. Vision is thus not a recording of sensory data sent through a one-way system to the brain. It is an active, exploratory, cyclical process with continual feedback and interaction throughout the visual system. This system, in other words, has its own intelligence. What we 'see' is not a direct recording of the material world but a mental configuration that we interpret as an image, the result of a highly exploratory and complex information-seeking system (Finke, 1988:185). It was probably an appreciation of this fact that prompted RL Gregory, a neuropsychologist and an authority on visual perception, to coin the phrase 'eyesight is insight' (Barry, 1997:82).

A distinction needs to be made between observation and perception. We are all familiar with the discrepancies that arise when two eyewitnesses are asked to describe the same occurrence. What one observes, processes, analyses, attributes meaning to, commits to memory and is able to recall is determined not by observation only, but also by what was perceived. There is more to visual literacy than observation and it is argued that it is possible to develop the skills necessary to enhance perception and visual comprehension which should lead to the enhancement of visual intelligence.

WHAT IS VISUAL LITERACY?

Literacy, *per se*, is a 'material, multidimensional construct' (Faigley, 1999:175) and in order to become effective participants in multiliteracies, learners need to understand how the resources of language, image and digital expression can be deployed independently and interactively to construct different kinds of meanings. This means developing knowledge about, *inter alia*, visual meaning-making systems and then learning to relate and apply this knowledge in various contexts. What, then, is visual literacy? There are many definitions of visual literacy. There are commonalities and differences among the following examples, and through this variety they contribute to a broader understanding of the concept.

Visual literacy encompasses the ways people perceive objects, and interpret and learn from what they see (Elkins, 2008:2). Dallow (2008:94) suggests that visual literacy has two aspects: the ability to understand images and the ability to use them, while, according to Shifrin (2008:107), visual literacy uses the same competencies as phonetic literacy: decoding, comprehension and interpretation. Messaris (1994:22), outlining the scope of visual literacy, distinguishes between description and analysis. Description involves an account of a series of events or the features of a particular object or situation. Analysis differs from description in two major ways. First, it deals with generalities, classes of objects, situations or events, rather than individual cases. Second, it is concerned with establishing the conditions under which these events or characteristics can be expected to occur. The focus is on causality, on contingent relationships, on the hypothetical and on estimates of likelihood. The *Online visual literacy project* (1998) defines visual literacy as the ability, through knowledge of the basic

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visual elements, to understand the components and the meaning of an image. In the view of McMullen and Woo (2002), visual literacy involves thinking critically and analytically about visual information in order to assess the meaning and intention of that information, and using these skills to create new forms of visual communication. Avgerinou (s.a.) explains visual literacy as a group of competencies that allows one to discriminate between and interpret natural or constructed visible actions, objects or symbols in the environment. Brill, Kim and Branch (2000, cited in Sims, O'Leary, Cook & Butland, 2002) describe visual literacy as 'a group of acquired competencies for interpreting and composing visible messages. A visually literate person is able to: (a) discriminate, and make sense of visible objects as part of a visual acuity, (b) create static and dynamic visible objects effectively in a defined space, (c) comprehend and appreciate the visual testaments of others, and (d) conjure objects in the mind's eye.'

Using these explanations as a point of departure, various dimensions of visual literacy emerge. It is the ability to:

- Decode and identify
- Comprehend and make sense
- Interpret
- Question
- Challenge, contest or think critically
- Evaluate
- Create texts that communicate with visual images

This implies that a visually literate person can:

- Read and understand proposed meaning
- Deduce and interpret purpose and intended meaning
- Analyse and evaluate covert and overt meaning
- Evaluate the form, structure and features of an image
- Use images in a creative way to express meaning
- Create own images to convey messages
- Learn from what she or he sees
- Understand the philosophical and physical context of the image

A 'literate' person is able to decipher the basic code and syntax, interpret signs and symbols, correctly apply terms, understand how things fit together, and work out and design or create new products. The skills or competencies listed above point to both cognitive and social-practice or social-constructive approaches to skills or competencies development which fit well with current thinking in relation to the nature and scope of literacy. The deduction of a range of competencies from the operational definitions furthermore serves as a basis for beginning to understand what one needs to know and be able to do to be visually literate. This, in turn, enables educators to establish how visual literacy can be taught and applied in the learning environment.

DEVELOPING VISUAL LITERACY

Like a printed text, an architectural blueprint, a mathematical equation or a musical score, a visual image has its own language. That people need to be taught to read, and that they *learn* to read, is an accepted fact. The skill of reading is itself a visual skill since it involves

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recognising individual or combinations of letters of the alphabet and linking them with appropriate sounds. From this simple example, it follows that visual literacy is an acquired skill which can be developed and enhanced.

In visual literacy, fundamental skills of accurate observation, understanding and comprehension of visual relationships are paramount. As visual images become more intricate and elaborate, if the ability to observe, identify, describe and analyse the features, situations, ideas, feelings and concepts within visual signs is not developed, interpretation remains at the level of impulse and supposition. The visual perception required for visual literacy is complex and multidimensional, and has visual, cognitive, aesthetic and emotional dimensions (Dallow, 2008:100-101).

Shifrin (2008:108) suggests that developing abilities and actions such as observing, analysing, critiquing, reflecting, speculating, drawing distinctions and responding to messages are ways in which visual perception and literacy can be brought into more conscious focus. This constitutes a cognitive operation in which comprehension, analysis and synthesis of the visual commentary is foremost (Burns, 2006:18). Developing visual literacy and cultivating the skills needed to interpret the content and context of visual images (Bamford, 2003) are gained through training in visual analysis (Burns, 2006:17; Shifrin, 2008:108) and through repeated engagement with visual materials. Strategies to promote visual literacy, namely developing and enhancing the skills referred to above, would include exposure to images and interacting with these images through thoughtful and thought-provoking questioning and discussion (Bamford, 2003). Images need to be deconstructed through observation, comprehension, analysis, synthesis, reflection, critique and interpretation of overt and covert visual information.

Clearly, one needs to move from treating images simply as records of reality to recognising their symbolic and metonymic quality within systems of imagistic representation. Images contain complex cultural and material content, and their interpretation is not simply a question of seeing. They are not mere conduits of meaning but are locations through which meaning is mediated (Veen, 1998). The visually literate individual will thus look at an image carefully, critically and with an eye for the intentions and assumptions of its creator (Thibault & Walbert, s.a.).

VISUAL LITERACY AS VISUAL INTELLIGENCE

Many examples can be used to question the adage ‘seeing is believing’ and to assert that visual observation cannot always be trusted. Optical illusions have been used for millennia. The Greeks used the principle in building the columns of the Parthenon to compensate for the illusion of concavity created by parallel lines, and we have probably all been intrigued by the optical illusions of the devil’s tuning fork, the impossible triangles, perpetually ascending stairs, profile silhouettes and radiating lines, to mention but a few. Our mind is the final arbiter of truth, and when confronted with illusions and paradoxes it adjusts perception and interprets the spatial structure from the context. This action requires a particular mental capacity to reason and solve problems.

Many images, however, are not obvious illusions or perception puzzles. Often the image portrayed has been specifically manipulated to elicit a particular response or to send a

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particular message. Because people have tended to become watchers rather than discriminating viewers, believers rather than reflective, visually aware critics (Barry, 1997:2), it is essential to move from the domain of basic visual literacy to visual intelligence.

Visual intelligence is defined as a quality of mind developed to the point of critical perceptual awareness in visual communication. It implies the ability to perceive, become aware, reason, analyse and communicate. It requires the integration of verbal and visual reasoning based on an understanding of how the elements that compose meaning in images are manipulated to distort reality, and the utilisation of the visual in abstract thought. Visual intelligence requires the cognitive ability to recognise and interpret embedded messages and attitudes within and between images and to appreciate the implications. Visual intelligence suggests not only skilled reasoning to understand the visual logic, but also the ability to apply this understanding to better the social, political or economic environments within which these images are used (Barry, 1997:6-7) Images are generally edited productions which portray the creator's opinions and views about the world. Lesy (2007:144) refers to the multiple truths embedded in a single image: the private and public assumptions, aspirations and convictions waiting to be activated by the viewer's gaze.

Because received images impact not only on the conscious, but also on the unconscious level, it is imperative to be aware of how the emotions are moved by the image. Pictures tend to impress themselves on us at the subconscious level and to stay with us, influencing our thoughts and actions as much as, if not more than, do words (Walker & Chaplin, 1997 4-6). Visual intelligence in practice thus means the ability to recognise the covert attitudes and messages embedded within the image, and to appreciate the implications of this manipulation or distortion. It implies an integrated perceptual awareness of mediated visual messages and a critical visual awareness that can be developed and exercised to think more creatively and to better comprehend what is communicated to us through visual means. Visual intelligence reflects a quality of creative problem solving that originates in perceptual processes and is characteristic of abstract or critical thinking.

RATIONALE FOR DEVELOPING VISUAL LITERACY

Changes in the social environment and means of communication are making new demands on education, which has, as priority, preparing the youth to participate and contribute meaningfully in current and emerging social contexts. The world of communication has become multimodal and is no longer reliant on language-as-speech or on language-as-writing alone (Kress, 2000). Bleed (2005) argues that visuals created with new technologies are changing what it means to be literate and that in the 21st century the ability to create and interpret visual media or 'text' is a form of literacy as basic as being able to read or write. Visual literacy is required as much as textual literacy.

At the beginning of this article, the ascendancy of the visual in communication in current society was pointed out. Education has, as a key objective, preparing young people to cope with current and future challenges in society, and enabling them to live meaningful lives and achieve responsible adulthood. Apart from the other reasons outlined below, this, in itself, would be sufficient justification for ensuring that learners leave school not only literarily but also visually literate.

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What would the converse be? Without a basic level of visual literacy, one is vulnerable to manipulation and exploitation by those who use images to inform, report, influence or persuade. Underdeveloped visual literacy skills weaken the ability to understand the relationship between the purpose and the actuality of images. As the amount of visually communicated information increases, the need grows for individuals to be visually literate (McMullen & Woo, 2002) so that they can discriminate between and interpret visual information. Being visually literate allows the viewer of images to grasp their larger social implications (Plantinga, 1995, in McMullen & Woo, 2002). Without visual literacy, individuals may fail to see, understand and learn to harness the persuasive power of visual media (Day, 1997, in McMullen & Woo, 2002).

From an educational viewpoint, the benefit of developing visual literacy revolves particularly around empowerment, defined as the process through which learners learn critically to appropriate knowledge outside their immediate experience in order to broaden their understanding of themselves, of the world and of the possibilities of transforming assumptions about the way we live (McLaren, 1989:186).

The points below relate to the benefits of visual resources and the acquisition of incremental levels of visual literacy in educational contexts. This list is not comprehensive, but should serve as a justification for expanding the pedagogical space by including visual materials in learning environments and by developing visual literacy.

BUILDING TEACHING CAPACITY BY SUPPLEMENTING RESOURCES

Many classrooms lack adequate learning support materials and a lack of materials is often used as an excuse for inadequate learning facilitation. Introducing visual materials to the classroom, and supplementing available texts, can overcome this hurdle. With little effort and cost, educators can develop unique and appropriate learning materials, although the process requires careful thought and a level of visual literacy on the educator's part. Carstens' research (2004:459) indicates the need to tailor materials to match the recipients' literacy levels. She points out that there are significant differences in the ability to process, interpret and accept visuals between visually literate and visually illiterate viewers. Relevance to culture and tradition also needs to be considered. These are just some of the issues that educators need to consider when selecting visual resources for use in their classrooms.

Nevertheless, educators should not be discouraged from using visual materials in their teaching. Anthonissen and Kirsten (2003:92) point out that certain kinds of information may be more directly communicated, more easily understood and cognitively better processed through visual media than through verbal communication. This supports the argument for supplementing existing resources with visual material.

USING VISUAL RESOURCES IN TEACHING RESULTS IN A GREATER DEGREE OF LEARNING

Visual literacy precedes verbal literacy in human development, since visual symbols are non-verbal representations that precede verbal symbols. Visual literacy is the basic literacy in the thought process and is the foundation for reading and writing. Developing skills in visual

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literacy and analysis strengthens the development of verbal literacy as the spoken or written word. Engagement with visual materials stimulates the development of visual literacy skills, and stimulates discussion, critical verbal engagement, negotiation and interaction with others. Visual resources include a range of elements and are not confined to illustrations, photographs and visual icons, but include visual organisers such as mind maps, Venn diagrams, flow charts and analysis frameworks such as charts, graphs and grids in linear, non-linear and 3-D formats. Certain subject fields (such as maths, with its use of graphs) traditionally use and require the use of visual resources, but visual resources can be used in all fields of study. The purpose of using visual resources in the learning situation, however, should primarily be to encourage thoughtful analysis and to maximise achievement of the envisaged learning outcomes (Stokes, 2000:16-17).

Curricula nevertheless continue to privilege the development of literary literacy skills over visual literacy education. It is uncommon to find educators engaging learners in developing visual literacy and actively, critically analysing visual messages. Visual communication is barely commented on. Petterson (2002:107) argues that:

> in today's information society, students risk leaving compulsory school as visual-illiterates, never having learned a critical approach to the images they encounter in the news media and in informative material of various types. The risk is great that students – far too uncritically – believe that all images they see describe the world correctly and reliably.

As will be outlined below, using visual resources in learning situations particularly benefits learners whose cognitive learning style is predominantly visual. In addition, learners who have language barriers or hearing disorders may well benefit from having visual instructional materials incorporated into their learning programmes.

BROADENING HORIZONS – LIVING IN A GLOBAL, DIGITAL WORLD

Our world is being transformed by technology and human ingenuity, and children are becoming increasingly familiar with the internet, instant messaging, chat rooms, blogs and other technological innovations common in the 21st century. The rapid rate of change and the influence of technology on life require that learners acquire evolving skills to cope with and thrive in this changing society (Metiri Group, 2002).

Visual resources are important in all content areas and have the potential to engage learners actively in the learning process. Images as visual representations are able to capture and communicate concrete experiences that would be difficult or impossible to experience in real life, such as pictures or satellite photographs of celestial bodies, or of microscopic organisms or processes. Visual materials provide a means of transcending geographic and cultural boundaries, but although the permeability of these boundaries is far greater for images than it is for language, Messaris (1994:168) cautions about the existence of cross-cultural barriers to interpreting and understanding images. There can be no doubt that people who have spent all their lives in secluded rural communities will have difficulty making sense of images typical of life in a big city. Research by Segall, Campbell and Herskovits in 1963 (1963:769) showed that people who live on plains where there is a large horizon and where great distances can be viewed, understand perspective because they are used to seeing figures getting smaller as they

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go away. Conversely, people who live in forests or in high-rise cities are limited in their visual understanding of graphic conventions used to represent distance. Elements of visual literacy, like language literacy, are culturally specific and, to be understood, need to be contextualised and explained.

RECOGNISING DIFFERENCE IN LEARNING PREFERENCES AND DEVELOPING MULTIPLE LITERACIES

Challenging conventional educational thinking in the early 1980s, Gardner's pioneering work on multiple intelligences identified visual intelligence as one of the seven intelligences. Drawing on his theory, it can be deduced that, for a learner to benefit optimally from learning experiences, the curriculum and instructional design should accommodate individual interests, learning preferences and abilities. According to Gardner, seven kinds of intelligences allow seven ways to teach rather than one. Furthermore, all seven intelligences are needed to live life well, and teachers therefore need to attend to all of them and not just the first two (linguistic and logical-mathematic), which have been their traditional concern (Hatch & Gardner, 1993:164-165; Smith, 2008). It is notable that Francis Galton, in 1883 already, had concluded that there were at least two types of thinkers: the verbal and the visual.

It is estimated that at least 60 percent of learners can be categorised as visual learners (Anderson, 2003:4) and providing opportunities for, and acknowledging visual learning, gives those whose preferred learning style is visual the opportunity to excel and to build a sense of self-worth and competence (Farmer, 2007:32). A similar argument was presented earlier on in this article when Olivier's position in relation to promoting social and gender equity and meaningful engagement within society through recognising and developing visual literacy and intelligence was presented.

Learning to understand and interpret images does not require lengthy initiation, as do language learning or learning to read (Messaris, 1994:40). Visual learning provides the opportunity to develop multiple literacies other than the visual, such as spatial, verbal, writing, reading. Visual analysis uses processes of reflection, experiential learning and social constructivism, which, in turn, rely on and enhance these multiple literacies. Images, like language, are a means of making sense of reality, and visual literacy provides an alternative means of access to knowledge and understanding (Messaris, 1994: 21).Development of these skills leads to higher-order thinking and problem solving.

DEVELOPING CRITICAL THINKING SKILLS

To understand visual messages, more is needed than mere perceptual and everyday cognitive skills. Higher-order thinking skills are essential for making sense of, analysing, interrogating, synthesising and evaluating images. Ewen (1988:156) comments that we are educated from infancy to look, but are not encouraged to see and interpret simultaneously. Our eyes take in images with little critical resistance. Images are not necessarily direct mechanical records of the world around us and can be framed, focused and de-contextualised. Interpreting them requires refined visual analysis skills.

Bloom's taxonomy of cognitive domain educational objectives (as amended by Anderson and Krathwohl (2001:67-68) indicates that, although the lower-level objectives are important, the key to visual intelligence is the ability to operate at the higher levels.

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Table 1: Bloom's taxonomy of cognitive domain educational objectives: a comparison between the original and revised taxonomies

Bloom Original 1956	**Bloom Revised 2001**
Knowledge Remembering or recognising something previously encountered without necessarily understanding, using, or changing it.	**Remember** Recalling the information
Comprehension Understanding the material being communicated without necessarily relating it to anything else	**Understand** Explaining the ideas and/or concepts
Application Using general concepts to solve a particular problem	**Apply** Using the newly acquired knowledge in another familiar situation
Analysis Breaking something down into parts	**Analyse** Comparing and differentiating between constituent parts.
Synthesis Creating something new by combining different ideas	**Evaluate** Justifying a decision or course of action
Evaluation Judging the value of materials or methods as they might be applied in a particular situation	**Create** Generating new ways of creating products, ideas or ways of viewing things

From this taxonomy, it becomes clear that learners should not only engage with images that are provided or 'consumed', but should also be given the opportunity to create with images. Projects that require learners to select, rearrange, crop, put together and restructure visual material employ and require the integration of cognitive learning domain competencies at all levels. Engaging with the material extends visual literacy skills and builds visual intelligence.

OPPORTUNITIES FOR COOPERATIVE LEARNING

Education has as its purpose to prepare children for lifelong learning and to develop abilities and competencies required in the 21st century. A cooperative and integrated approach to teaching and curriculum development through outcomes-based education, the current approach to education in South Africa and other countries, requires a holistic approach to teaching and learning. Learner interaction, active participation and cooperation are essential; the learning experience is not compartmentalised, and various aspects of the curriculum are brought into meaningful association. When visual materials are introduced into such a teaching and learning environment, interest in and attention to the work are encouraged and

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critical enquiry is promoted (Shifrin, 2008:113-114). Engaging with visual resources requires reflective engagement with the resources and with peers, since, as Crouch (2008:196) points out, engaging in activities around visual resources is not a solitary, individual action but part of a wider set of social practices which require and encourage interaction, dialogue, negotiation and critical engagement in conscious thought. Because pictures provide a high level of interest and may be seen as less threatening than text, they invite commentary and discussion. Inventive thinking and effective communication are logical gains associated with cooperatively engaging with visual data in a learning situation.

CONCLUSION

The steady increase in information and knowledge has created an ever greater need for breadth of view and cross-disciplinary conversation. It is in this context that this article has put forward an argument for expanding the educational space through the development of visual literacy.
Perhaps Hill (2004:130) best captures the rationale for championing visual literacy:

> Failing to recognize and take pedagogical advantage of visual literacy's place across the disciplines implies that we are not concerned with helping our students respond to visual messages in an informed and critical way. If we can tap into the experiences, expertise and interest in visual communication that exist, we can build a new paradigm that takes rhetorical education seriously and recognizes it for the multidisciplinary endeavour that it is.

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