GRAPHICACY AND CULTURE

Refocusing on visual learning

Xenia Danos

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XENIA DANOS

Just like literacy and numeracy, graphicacy is a vital tool for communication, learning and everyday life

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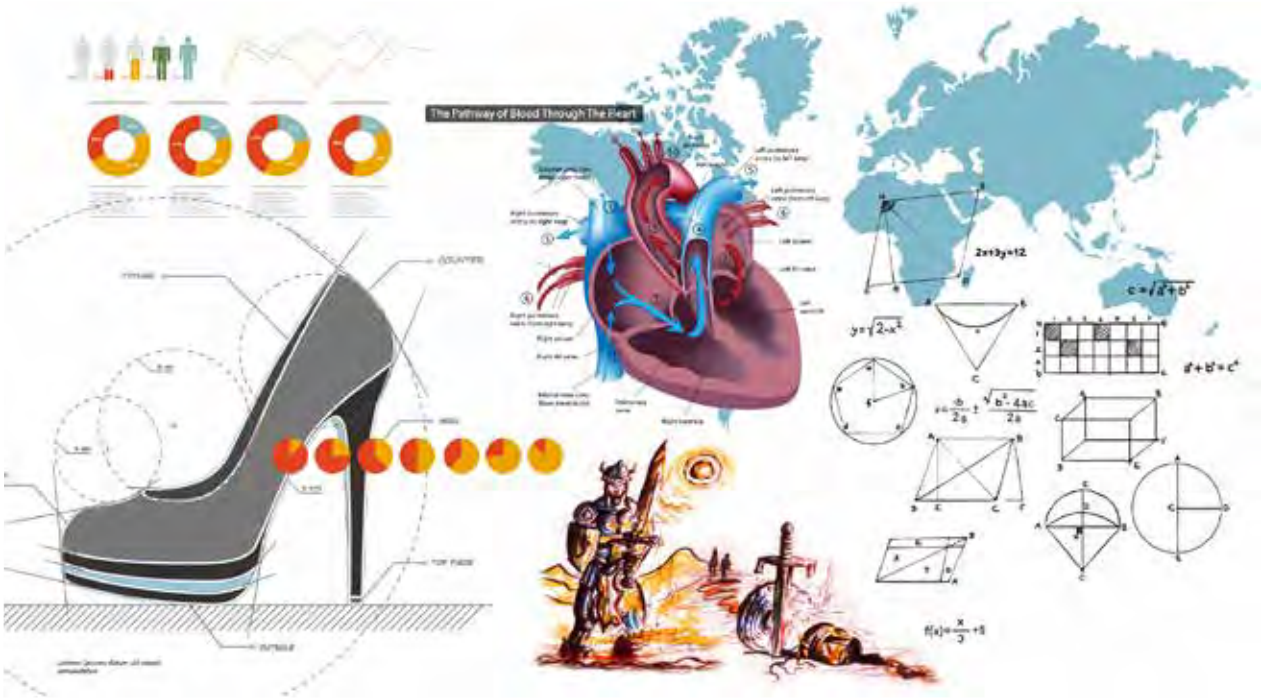

Figure 1 A montage of images created for a video by SimcoeMedia indicating the use of graphicacy in different areas. The video shows Xenia Danos talking about this book and can be seen at **http://www.youtube.com/ldpressbooks.**

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I would like to express my gratitude to the many people who saw me through this book; to all those who provided support, talked things over, read, wrote, offered comments, allowed me to quote their remarks and assisted in the editing, proofreading and design.

I would like to express my special appreciation and thanks to my advisor Professor Eddie Norman, whom I was blessed and honoured to have had as a mentor during my PhD, and a good friend and guide in the years after. Without his hard work, long hours, patience and commitment to the cause, this book would have not materialised. I would like to thank you Eddie for encouraging me in my work and for allowing me to grow as a research scientist. Your guidance and advice on research and career, amongst others, have been priceless.

I would also like to thank Professor Ken Baynes, who has been supporting me and my work from the early stages of my research. His work has set stepping stones to my career so far, which seems to continue with his contribution to the book, for which I feel privileged.

I also want to thank Kathy Norman and Peter Simcoe for their help in shaping and sharpening up the book, as well as all other contributors who have shared their experiences related to graphicacy through the case studies: Adrian Draigo, Nicole Danos, Nancy Aguilar-Roca, Anna-Maria Yiannikou, Diarmaid Lane, Niall Seery, Seamus Gordon, Nikos Danos, Eileen Adams and Jennie Pedley.

A special thanks to my family, who supported me in every step of the way. Having the opportunity to include work from my sister and father, as two different case studies in the book has been a precious occurrence. I would also like to thank all of my friends who supported me in writing, and encouraged me to strive towards my goal.

Xenia Danos

Nicosia

May 2014

ILLUSTRATIONS

Introductory essay by Ken Baynes Except for Joseph Paxton's blotting paper sketch for the Crystal Palace, which is reproduced by permission of the Victoria and Albert Museum, London, all the illustrations in this essay are taken from Welsh Arts Council exhibitions which Ken Baynes organized in the late 1960s and early 1970s. The photographs are by Peter Jones who was Art Director of the Council at this time. Sadly Peter has now passed away, but it was an inspiration to work with him and I hope his revolutionary influence on our current approach to art exhibitions will be more fully recognized in the future.

Recently, Huw Jones (no relative) has written about the pioneering work of the Welsh Arts Council and particularly the *Art and Society* series on which Peter and I worked. Readers interested in finding out more can read his articles in *Planet* and *Visual Culture in Britain*:

- Huw David Jones (2009) 'War Declared: Art and Society in Wales 1969-1977', *Planet: the Welsh internationalist*, no. 196, pp47-96.

- Huw David Jones (forthcoming, 2014) 'Redefining Art and Culture: the Welsh Arts Council's Art and Society Exhibition Series 1969-76', *Visual Culture in Britain*, due for publication early in 2014.

A number of the illustrations in **Chapters 1-4** come from QUICK ON THE DRAW, an exhibition about the everyday uses of drawing. The show was organized by Brochocka Baynes in conjunction with the City Art Centre, Edinburgh; the Harley Gallery, Welbeck; and Croydon Clocktower. It was shown in addition at Loughborough University in Autumn 2009 where it was accompanied by seminars and events about the significance of modelling and the value of drawing as a modelling medium. The permission of Loughborough Design School to reproduce The Great Wall panels from the Quick on the Draw exhibition is gratefully acknowledged.

Figures 2.2, 2.3, 2.4, 2.8 and 3.2 are reproduced from Rhoda Kellogg's book, *Analysing Children's Art* (1970). This was originally published by National Press Books, Palo Alto, CA. Ths company was taken over by Mayfield Publishing, which was itself taken over by The McGraw-Hill Companies, Inc. We are grateful to McGraw-Hill for permission to reproduce these figures. Similarly, Figure 2.1 is reproduced from Rhoda Kellogg's book, *What Children Scribble And Why* (1959).

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GRAPHICACY AND CULTURE: Refocusing on visual learning

This book has 3 sections:

- **Introduction** by Ken Baynes discussing 'Graphicacy and Visual Culture'.
- **Chapters 1-4** in which Xenia Danos reviews published research concerning graphicacy and introduces her taxonomy of graphicacy.
- **Chapter 5** which uses Danos' taxonomy to categorize the use of graphicacy within case studies from different contexts and professions.

"It isn't only artists that make drawings"

These were the words that introduced the *Quick on the Draw* exhibition, which demonstrated the importance of drawing for people in many walks of life. A key exhibit was 'The Great Wall' which showed the use of drawing in a range of professions (see **TABLE 2** on page 40). There were also case studies showing the use of drawing in architecture, display design (fireworks), evolutionary biology, product design, psychotherapy, textile design and town planning.

Graphicacy concerns much more than drawing as this book will demonstrate. However, the panels from 'The Great Wall' have been included at the start of the chapters because of their powerful contribution to understanding the importance of graphicacy and visual culture.

Figure 2 Title panel for the Quick on the Draw exhibition, designed by City of Edinburgh graphics department (2009)

The *Quick on the Draw* exhibition was organized by the City Art Centre, Edinburgh; Harley Gallery, Welbeck; Croydon Clocktower and Brochocka-Baynes.

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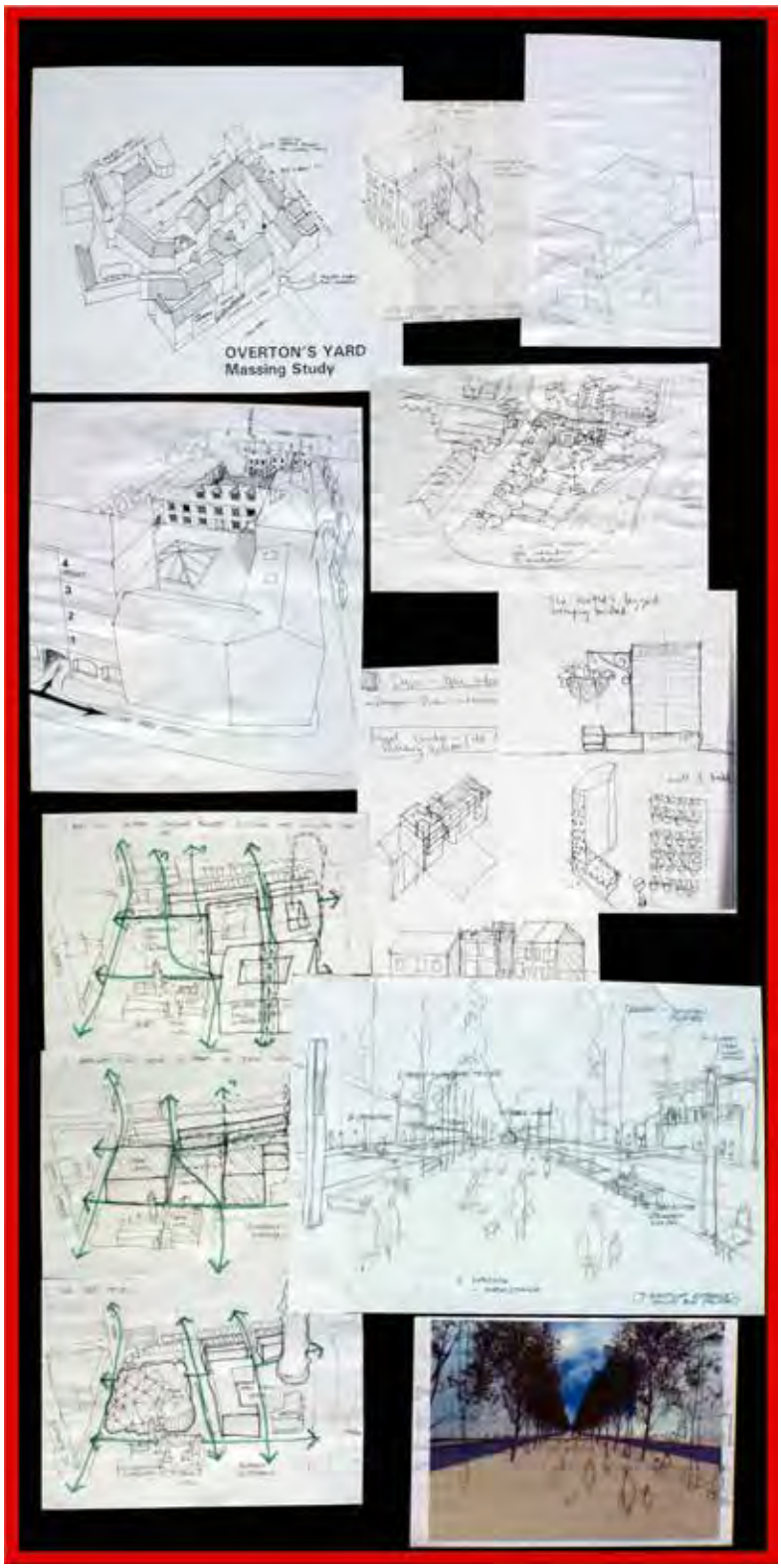

INTRODUCTION: GRAPHICACY AND VISUAL CULTURE

Ken Baynes

Evolutionary biologists describe *homo sapiens* as occupying the 'cognitive niche' in the evolutionary matrix. Many, including the distinguished American scientist Edward O Wilson (2012), also focus on the particular sensory world of humans, describing us as audio-visual animals. Although we can only experience a relatively limited segment of potential visual input, our perception of the visual world is intense and vivid. Human intelligence is partly the result of (and depends on) a dynamic interaction between sound and vision.

Human symbol systems frequently involve models that are both visual and aural. The prime example is language, originally spoken but later given greater power and durability by being physically embodied in visual models – writing. The archaeologist Colin Renfrew (2007) sees the externalizing of language in a form that could be passed from generation to generation as a development that, along with tool use, agriculture and cooking were turning points in human culture and cognition.

Graphicacy is essentially concerned with the human ability to make and interpret meaningful marks. This ability was evident long before writing first emerged. The earliest known purposeful marks so far found seem to be around 75,000 years old. They are from the Blombos Cave in South Africa. Found alongside pointed bones used in hunting, they are incisions on flat sides of red ochre. They remain enigmatic: cross-hatching and long lines. The beginnings of art? An aide memoir of moon cycles? A tribal mark? It is now almost impossible to know. However, for anyone interested in the cultural importance of the visual, they are deeply evocative. They beg the question: why did mark-making emerge and what was its evolutionary value?

In his book *Inner Vision*, Semir Zecki (1999) attempts a wide-ranging analysis. Noting that many animals (mice and moles, for example) manage with poor or rudimentary vision he asks: 'what is the visual brain there for?' He rejects as simplistic the obvious answers such as 'to recognize people, or to find your way about, or to choose a partner or to acquire food or to read'. Not that these are not important but in Zecki's view there is a deeper function more directly contributing to the unique nature of human cognition:

> ' The answer to our question is, I believe, much simpler and more profound – we see in order to be able to acquire knowledge about the world.'

Since knowledge about the world is the basis for human action this is hard to disagree with. But Zecki seems to have a deeper significance in mind. It is the ability of the human mind to appreciate a quality of 'meaning' in life and in the environment. Zecki goes on:

> 'It takes but a moment's thought to realize that the acquisition of knowledge by the visual brain is no easy matter. The only knowledge that is worth acquiring is knowledge about the enduring and characteristic properties of the world; the brain is consequently only interested in the constant, non-changing, permanent and characteristic properties of objects and surfaces in the external world, those characteristics which enable it to characterize objects.'

And we might add to characterize such things as people, weather, movement and so on.

In fact, the brain is highly selective in interpreting the sensory data that comes from the eyes. It seems that it is constantly comparing incoming signals with models that the mind has built up as a result of experience. In one sense the picture of the world which is in the mind is an 'imaginative' reconstruction built from sensory data and treasured by the human organism for its survival value.

Steven Pinker (1997) identifies four elements that may have been the key to the emergence of *homo sapiens*. He lists group living, manipulative skill and hunting. But he gives pride of place to stereoscopic colour vision. He asks: 'why would vision make such a difference?' and supplies a strikingly convincing answer:

> 'Depth perception defines a three-dimensional space filled with movable solid objects. Color makes objects pop out from their backgrounds, and gives us a sensation that corresponds to the stuff an object is made of, distinct from our perception of the shape of the stuff. Together they have pushed the primate brain into splitting the flow of information into two streams: a "what" system, for objects and their shapes and compositions, and a "where" system, for their locations and motions. It can't be a coincidence that the human mind grasps the world – even the most abstract, ethereal concepts – as a world filled with movable things and stuff.'

Evidently, the ability to attribute meaning to visual information is fundamental to human intelligence, not simply in relation to the environment and other humans but also to abstract concepts, philosophical ideas and attempts to decode the 'meaning of life'.

In my own work (Baynes, 2013), I refer to Pinker's idea that the human mind builds causal models of the world and that it is these models that enable human beings to respond creatively to new and challenging situations. Our evolutionary trade mark is action based on thinking. What does this mean for *homo sapiens*? Unlike other animals, whose intelligence is usually limited to quite specific areas of behaviour (the migration of birds, for example) humans have general purpose intelligence. The point is (to quote Pinker) that 'humans achieve their goals by complex chains of behaviour, assembled on the spot and tailored to the situation'. In the animal world, we are unique in combining a number of characteristics:

- We use models of the causal structure of the world (cognitive models) in order to predict and react creatively to changes in the environment and the behaviour of others;
- We externalize and share the causal models through language, images, physical models, mathematical calculations and countless others, many of which take graphic form;
- We learn to read the models and learn from the models during each individual lifetime, making use both of the uniquely long human childhood and an ability to learn new things which lasts into maturity.

education

Biologist
Dr Maggie Manson
Lecture illustrations

Veterinary student
Callum Patterson

Research into the developmental value of children's drawings
Yvonne Outterside
Eileen Adams
Prof. Ken Baynes

Failure Analyst
Prof. Dr. C. Mattheck

Education

Drawings by staff in the Faculty of Mathematics, Computing and Technology, The Open University

Chapter One

GRAPHICACY AND EDUCATION

INTRODUCTION

To gain a clear understanding of what graphicacy is, or otherwise known as visual literacy, existing literature has been brought together and analysed to provide definitions of graphicacy as given by a number of authors. The international emergence of graphicacy in the UK, USA, South Africa, Australia, Ireland and Cyprus is then described along with typologies of graphicacy and Fry's taxonomy (1981). The chapter continues with a review of prior studies of graphicacy written from a range of different perspectives. These are presented and categorized within a range of subject areas and disciplines. Furthermore, different authors' work on aspects relating to how useful or not graphicacy can be during teaching and learning is discussed.

GRAPHICACY AND EDUCATION

WHAT IS GRAPHICACY

In the 1980s the UK Associated Examining Board described graphicacy as all forms of diagrammatic presentation used to communicate information that cannot be conveyed clearly and conveniently by words or mathematical notation alone. Around the same time, other authors supported a similar view, saying that to be graphicate is a fundamental human ability in the same way as to be literate, numerate and articulate. Drawings should not be seen only as pieces of artwork but as aids to understanding communication, ideation and problem solving processes (Krane & Dyson, 1981; Postman, 1979).

Graphicacy is the ability to understand, read and create still visual images other than words/letters or numbers, as a means of communication. These can include maps, diagrams, drawings and flow charts, amongst others. It is argued that literacy, numeracy, oracy and graphicacy are the 'four aces' in the pack of education. If any one of these is left out of the pack, education is incomplete (Balchin & Coleman, 1965:85; van Harmelen, 2002). Balchin refers to graphicacy as the first type of communication to evolve between human beings, with the beginning of highly civilized skills such as map-reading and spatial planning (Balchin, 1976).

A range of definitions exist to describe the ability to communicate through pictures and images. In addition to graphicacy, two of the terms most commonly used today are 'visual communication' and 'visual literacy'. A range of categories are also widely used to describe some elements of graphicacy, such as 'cartography' and 'drawing'. Stokes (2002) explored definitions of some of these terms and **TABLE 1** shows some of those she presented.

These definitions recognize the complexity of the issues by including terms such as read, interpret, understand, recall, reconstruct, communicate, decode, and create. Becoming graphicate requires the development of such competencies within particular cultural contexts 'although there are universal symbols or visual images that are globally understood' (Sinatra, 1986:12-13).

Authors such as Fry and Stokes have emphasized that graphicacy is a two-way matter. Fry stated that 'reading and comprehending graphs is only half the graphical literacy; the other half is the ability to draw them' (Fry, 1981:388). Similarly, Stokes refers to the ability 'to interpret images' as well as 'to generate' images for communicating ideas and concepts (2002:10). The ability to read and understand images is also often referred to as 'inbound' or 'incoming'. The ability to create images is sometimes referred to as 'outbound' or 'outgoing' (Balchin, 1976; Wilmot, 1999; Balchin & Coleman, 1965). Wilmot realized graphicacy was a complex form of communication in that it utilizes some form of symbolic language to convey information about spatial relationships (Wilmot 2002:326). She calls graphicacy a 'tool' through the use of which we are able

TABLE 1 DEFINITIONS OF TERMS RELATED TO GRAPHICACY (Stokes, 2002)

Term	Definition	Source
Visual literacy	'… the ability to read, interpret, and understand information presented in pictorial or graphic images'	Wileman (1993:114)
	'… the learned ability to interpret visual messages accurately and to create such messages'	(Heinich et al. 1999:64)
	'… a group of competencies that allows humans to discriminate and interpret the visible action, objects, and/or symbols, natural or constructed, that they encounter in the environment'	The Education Resources Information Centre (ERIC)
	'… an organizing force in promoting understanding, retention, and recall of so many academic concepts with which students must contend'	Robinson (as cited in Sinatra, 1986:v)
	… the active reconstruction of past visual experience with incoming visual messages to obtain meaning, with the emphasis on the action by the learner to create recognition	Sinatra (1986:5)
Visual communication	… the use and interpretation of images is a specific language in the sense that images are used to communicate messages that must be decoded in order to have meaning	Branton (1999); Emery & Flood (1998)
Visual thinking	'… the ability to turn information of all types into pictures, graphics, or forms that help communicate the information'	Wileman (1993:114)

to 'communicate and share our spatial knowledge with others' (339). Boardman shared a similar belief, and stated that graphicacy, which complements literacy, numeracy and oracy as a means of communication, describes the way in which spatial information is communicated other than by words or numbers alone (Boardman, 1990).

Fisher also talks about spatial development, which can be considered as elements of graphicacy, and describes it as the capacity to perceive the visual world accurately and to recreate visual experience in the 'mind's eye' (Fisher, 1990). van Harmelen (2002:3) gives a similar but much simpler definition, describing it as 'our ability to navigate in our space'. Turbayne (1970) identified three basic steps in the process of perception when dealing with visual literacy: selection, organization and interpretation of stimuli. Frame of reference is an additional active factor which can be added to Turbayne's list.

THE INTERNATIONAL EMERGENCE OF GRAPHICACY

Research into graphicacy, or visual literacy, has emerged in a number of countries around the world. The conceptual history seems to lead to at least two primary starting points: the work of Balchin and his colleagues in the UK in the 1960s and the work of Fry in the USA in the 1970s. These are described below, as well as its emergence in South Africa, Australia, Ireland and Cyprus being noted as examples of graphicacy's wider reach.

The general term used for communicating through visual images in the UK is 'graphicacy'. The word graphicacy has emerged as a natural development to stand 'next to literacy, articulacy and numeracy' (e.g. Balchin, 1976:85) which can be considered as the basic skills which underpin the school curricula. When the word graphicacy first appeared in the mid-1960s in a journal paper published by Balchin and Coleman (1965), it was presented in the context of geography. Balchin later defined graphicacy as 'the communication of spatial information that cannot be conveyed adequately by verbal or numerical means alone' (1985:8). The term struck a strong resonance and influenced academics both in the UK and other countries, across a range of subject areas.

In New Jersey (USA), Fry talked about 'literacy in graphs which was beginning to approach word literacy' (1974: 383). He used the term 'graphical literacy' to describe 'the ability to read and write (or draw) graphs', and defined a graph as 'a two dimensional visual representation of a concept in a nonverbal or at most partly verbal form' (ibid, 390). 'The bar graph' and the 'time line' (ibid:387) were given as examples. Supported by the view that 'pictures, maps and other types of graphs have been used throughout the ages, since or before written verbal language' (ibid:383) he proposed that 'reading teachers are well equipped to take active educational leadership in graphical literacy because they already have many skills that are readily transferable' (ibid:385). He suggested that study skills instruction should include not just the reading and writing of graphs, but the fact that a prime study technique is to translate a verbal passage into a graph. He suggested that a taxonomy such as his could have another important curriculum-related function. It can serve as the basis of achievement tests. Furthermore, the taxonomy could be useful to students and practitioners in various fields outside of education, such as advertising, journalism, television, computer programming and business report writing. Or in any case where someone received or sent two-dimensional visual information (1980).

Taking a similar view and using parallel examples, Tierney et al. from Boston (USA), in 1990 wrote; 'graphical literacy' is defined as the ability to interpret charts, maps, graphic, and other pictorial presentations used to supplement the prose in textbooks, non-fiction trade books and newspapers. Aldrich and Sheppard (2000) included a more extensive list of some of the forms of images included in graphicacy, which have been represented in **Figure 1.1**.

In South Africa, Wilmot completed research work in the mid-1990s, which was strongly influenced by the work of Balchin and Coleman, amongst others. At the time Wilmot's

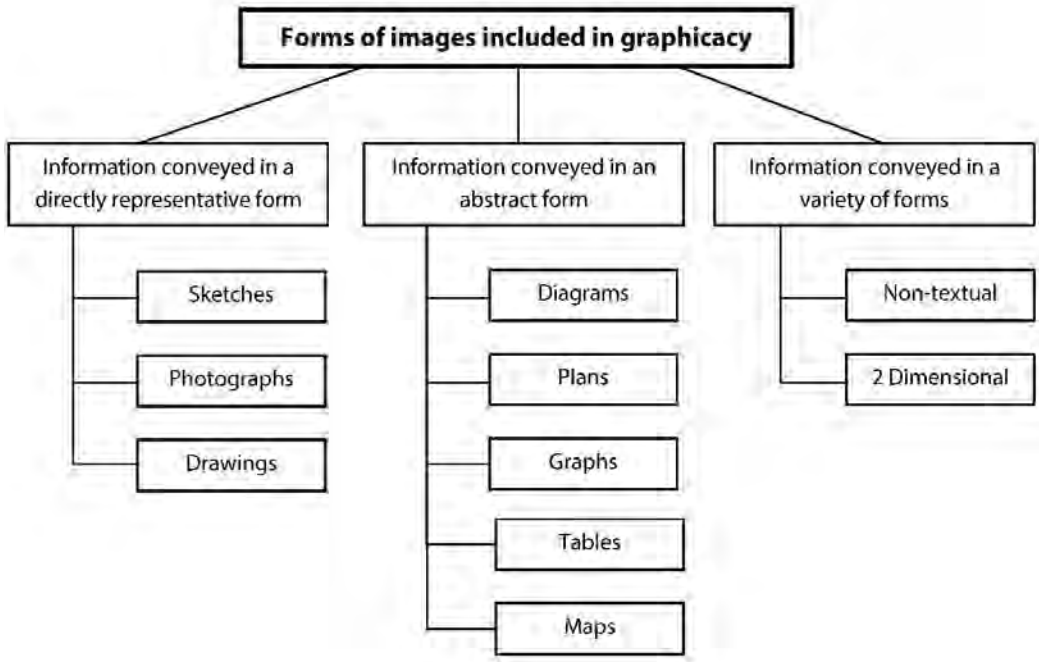

Figure 1.1 An illustration of some of the forms of images included in graphicacy taken from Aldrich and Sheppard (2000) *as analysed by Danos, 2012*

work was focused on graphicacy and primary school children, and it became very influential on the design of the South African educational system. Graphicacy was incorporated into the primary school curricula as one of the four basic skills children should be taught, along with literacy, numeracy and articulacy. In her report Wilmot (2002) describes graphicacy as 'a complex form of communication in that it utilizes some form of symbolic language to convey information about spatial relationships'. Van Harmelen, who worked closely with Wilmot for some time, took a geography perspective on the topic (influenced by Balchin) and suggested that 'graphicacy is the language the geographers use for the form of communication concerning space, place and time' (2002:5).

Another view taken around this area was from the Senate Standing Committee on Education and the Arts in Australia (1981:48). It was said that 'non-verbal communication is equally a fundamental part in social life, as visual learning directs students toward an understanding and appraisal of the mass media'. They talked about integrating visual learning in the school curriculum as they believe visual competence is necessary in many school subjects.

Ireland has a long tradition of graphical education, which has typically been associated with vocational education. This history has only recently been documented by Seery et al. (2001), and this indicates that at least in recent decades, there have been more general educational objectives. Graphicacy was first acknowledged and intentionally included within the syllabus of the Irish NCCA (National Council for Curriculum

and Assessment) in 1991, through a course entitled 'Technical Graphics'. The course was introduced to replace the previously vocational course of 'Mechanical Drawing'.

> 'Technical graphics proposed the "development of the cognitive and practical manipulative skills associated with graphicacy and to stimulate the pupils' creative imagination through developing their visuo-spatial abilities" (NCCA, 1991:5)' (as cited by Seery et al., 2011).

Technical graphics promoted the following graphicacy areas: 'communication of ideas, graphical problem solving, CAD competency and exploration of graphical concepts and principles through the medium of modelling' (ibid:2011).

In 2007, the technical drawing syllabus was replaced with the Design and Communication Graphics (DCG) syllabus. This new design driven syllabus was focused on developing graphicacy skills, amongst others, to 'prepare them (the students) to be creative participants in a technological world' (NCCA, 2007 as cited by Seery et al.,2011). It is believed that 'the design theme, which permeates the course, will empower the students to communicate their design ideas and solutions with accuracy, flair and confidence' (ibid:2011). Research on the importance of sketching skills towards enabling teachers to be more successful communicators has been completed by Lane, Seery & Gordon (2010). A case study written by these authors is provided in **Chapter 5**.

The importance of graphicacy in the curriculum even where it is not explicitly mentioned can be illustrated through an analysis of the Greek Cypriot curriculum. No official work on graphicacy has yet emerged, however, a study of both the primary and secondary school curricula conducted by the author in 2013 found graphicacy featuring 'silently in the background'. Teaching and learning using images is a commonly proposed strategy, amongst others, for many subject areas, although some subjects do not mention it at all, even implicitly. The national curriculum statements which do not mention graphicacy include: health education, community and political education, religious studies, ancient Greek and grammar, literature, IT, Financial studies, PE, and music. In 'Greek language and types of writing' the understanding of certain graphicacy elements are hinted at in the aim requesting students to learn about different media - old-fashioned and modern - in which different types of media are coded for both verbal and written information (on paper, books, posters, telephone, IT, TV, and radio). Students also have to understand that each type of text has its own structural conventions which affect the way each text is organized and represents the social reality.

In the Greek Cypriot national curriculum for Design and Technology, graphicacy is sometimes referred to (i.e. illustrate ideas using orthographic projection), but often the use of graphicacy is suggested more loosely (i.e. describe their ideas). The national curriculum does not reflect the heavy graphicacy use for both teaching and learning in this subject area. Cases where incoming (inbound) graphicacy skills are involved were found in some curricula, where students are required to read and understand information from images. In the curriculum for English as a second language for primary education, part of the list of teaching strategies to be used in the lessons included the use of images to better understand the text as well as the use of illustrated dictionaries.

Examples of where outgoing (outbound) graphicacy skills are involved in the Greek Cypriot national curriculum were also found where students are required to create images to communicate ideas and information. In French as a second language, within the list of proposed activities, the creation of posters, cartoon animations, and the writing and illustration of stories in groups is included. In History both inbound and outbound graphicacy skills are involved, as students have to learn to use maps and create historical maps, boards and diagrams either by hand or using technology. Within the proposed activities, a project or discussion is suggested based on art pieces from different Greek periods, observing the aesthetics and religious elements. Much emphasis is placed on illustrated material for teaching and learning.

TYPOLOGIES OF GRAPHICACY

In order to identify where graphicacy can be located across the curriculum and how it is developed through teaching, literature has been studied reporting the different types of images that exist and are used.

Baynes (2008) listed 49 types of drawings used in different professions (**TABLE 2**), which he considers to be the key types of images most commonly used i.e. technical drawing, diagrams, photographs etc.

Balchin (**TABLE 3**) grouped images into categories similar to the ones extracted from Baynes (2008) (**TABLE 2**). However there are some differences. For example, Balchin lists highway symbols, health & safety symbols and symbols on electrical equipment individually whereas Baynes used only the one category for symbols. Balchin explained this was done because there is an immense graphicacy range which is continuously expanding (1996). His list included some categories of these manifestations and examples of one category are named (Catling's list of 38 map types, as shown in **TABLE 3**).

TABLE 2 SOME OF THE KEY TYPES OF IMAGES IDENTIFIED BY BAYNES (2008) *as analysed by Danos, 2012*

Drawings used in different trades and professions taken from the *Quick on the Draw* exhibition
Analytical drawing, animation, annotated sketch, photograph, axonometric projections
Bird's-eye view
Caricature, cartoon, chart, CGI (computer generated image), choreographic drawing, circuit diagram, CAD (computer assisted design), computer printout, concept sketch, contour drawing, cut-away
Design sketch, diagram, doodle
Elevation, extended photograph
Field sketch, figurative drawing
GPS (Global Positioning System)
Isometric projection, illustration
Map, mono-print
Orthographic projection, observational drawing, overlay
Panorama, perspective, plan, pop-up, presentational drawing
Section, serial vision, sketch, specification, speed drawing, storyboard, symbol
Technical drawing, template, topographical sketch, tracing
X-ray section

TABLE 3 SOME OF THE 'MORE OBVIOUS CATEGORIES' OF GRAPHICACY GIVEN BY BALCHIN (1996) *as analysed by Danos, 2012*

Some of the more obvious categories of graphicacy given by Balchin
Conventional signs on maps
Highway symbols, warning information, direction, hazard and warning signs
Health and safety symbols
Anatomical diagrams
Symbols on electronic equipment
Logos and publicity acronyms
Map interpretation
Ground photographs
Art forms, graphic and computer graphics
Numerical quantities and information
Diagrammatic forms used to represent planned sequences i.e. flow charts etc.
Block diagrams, blue prints
Three dimensional representations i.e. globe, orthographic representation and pictorial sketches, perspective and grids
National flags, heraldic devices and badges
A wide range of map forms

Catling's list of 38 map types

Street map, postcard maps, maps in adverts, housing estate maps, tourist area maps, Ordnance Survey maps, railway maps, rooms plans, board game maps, textbook maps, wall chart maps, maps drawn by children, maps in birthday cards, land-use maps, resort maps, playmate maps, maps of mugs, building site plans, teaching pack maps, building plans, road maps, road-sign maps, town centre maps, trail maps, bus route maps, underground maps, storybook maps, maps on stamps, atlas maps, guidebook maps, teacher-drawn maps, picture maps, 'antique' maps, sketch maps, newspaper maps, tea-towel maps, globes, computer software maps.