

**The use of metaphoric language in introducing video and computer technology in  
preservice teacher education.**

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Abstract

This paper argues that the use of metaphoric language is common in non-literary fields of learning. Considering its potential for application as evidenced by reference in books, journal papers, e-zine discussions and blogs, and the historical time over which metaphors have been engaged in rhetoric, it is surprising that there is little allusion to their use in texts, in teaching practice, and in supporting methodologies for teaching and learning in the area of information technology. An overview of the literature pertaining to the role of metaphors in teaching and learning is provided as background knowledge for readers. The author then reports on her experience of the use of metaphors as an effective strategy to explicate conceptions of video recording, internet, and hypertext. These illustrate the argument that unconventional methods can support new and changing thinking in academia.

Keywords: metaphoric language, video recording, internet, hypertext, teaching and learning

## Introduction

As a teacher of English in Higher Education, the common use of metaphor in everyday conversation has always held a particular fascination for me. It is commonly accepted that “metaphors play a vital role in how we communicate, both in our professional and in our personal lives” (Bullock 2014, p. 250). In many years of participating in tertiary preservice teacher education, initially with a visual media foundation and now, progressively, with the adoption of information technology, it has been interesting to note that the use of metaphors has become more frequent when discussing topics in learning and teaching curricula besides that of English literature, where metaphors have a special role. To provide background knowledge and in order to argue for the usefulness of utilising metaphors in information technology teaching and learning, an overview of the literature is first presented.

Metaphors are part of a classification system explained by Marzano (2004) as “the process of identifying a general or basic pattern that connects information that is not related at a surface or literal level ... some similarities, however, link the two things at an abstract level” citing the example of “love is a rose” where “both are attractive or alluring; both can result in pain” (p. 75). That is, where an object, event or concept is described in terms of another seemingly unrelated object, event or concept and is expressed in the format of “target *is* source” (Lakoff and Johnson 1980) as, for example, when in receiving a romantic rejection to say “My heart [target] is wounded [source]”. Some examples from the research literature refer to using the metaphor of *scaffolding* as a teaching strategy (Beale 2002; Love 2002) and in anthropomorphising computer interface agents as a *personal assistant* (Meek 1995). More recently metaphors are used to explain the attitude of non-technology users of computers as “a fish doesn’t know it’s wet” (Kinash, Brand and Mathew 2012); to discuss the process of e-learning as moving from *possession* to *participation* (Divaharan, Lim, and Tan 2011); and, by way of literary metaphors – goalposts, Holy Grail, dragon slayers, beauty in the eye of the beholder - to comment on journal rankings in a 2010 editorial (Atkinson).

Metaphors are more than just a curious and colourful part of our language, they are also seen as an essential aspect of cognitive processing (Goatly 1997) and are used to help learners understand an unfamiliar concept by using a comparison or contrast with a more familiar one (Bushman and Haas 1997). We think in

terms of metaphors, indeed our dreams are seen by many as metaphoric (The Nightmare Dictionary), and to communicate effectively, we use a range of these figures of speech. Metaphors, says Lawler (1999) are “a human phenomenon” (sec. *What is this lecture about*, para. 1).

Metaphors have more than a passive role in communication; they are an active proponent in allowing the creation and production of new ideas. Studies of the right hemisphere of the cerebral cortex of the brain (the site of language processing) and associated cognitive processes “suggest that the figurative and literal language are processed simultaneously and share much structure” (Rohrer 2007, p. 31). Lakoff and Johnson (1980), pioneers in this area, combined their experiences in linguistics and philosophy to identify metaphors as being “pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature” (p. 3). This was demonstrated quite dramatically following the Twin Towers New York tragedy in 2001 where bystanders and media reporters, in trying to comprehend an event beyond their normal experience “resorted to the visual metaphors of television and film in an effort to adequately present their experience to others” (Penn-Edwards 2003). Comments from the shocked general public “likened the immediate aftermath of the attacks to scenes from shared common cultural and entertainment experiences - scenes from the fictional movie-illusions of *The Towering Inferno*, *Dante's Peak*, and *Independence Day* (as reported by Divaphill, 2001)” (Penn-Edwards 2003, p. 42). In trying to confirm their disbelief of the experience with others, the shocking flames, smoke and crumbling buildings were spoken of as initially being mistaken for “cinematographic special effects, or a promotional teaser trawling for pre-release popular viewing of a film” (Penn-Edwards 2003, p. 42). Such movie references are easily understood by most in western society.

The value of a metaphor is evidenced in both classic and common literature whether couched in rich descriptive grammatical terms or colloquial expression. It is the ultimate comprehension device and instigator of new concepts. D'Ambrosio (2001) argues that “intrinsic to hierarchical power is the control of knowledge” and that “the full cycle of generation, organization and diffusion of knowledge intertwines with needs, myths, metaphors and interests” (p. 329). Stefik (1996) went further stating that “because metaphors can guide our imagination about a new invention, they influence what it *can be* even before it exists” (p. xvi). Indeed the use of metaphors in science “at times influences the *formulation* of scientific problems and the ways in which problems are conceptualized and approached” (Garfield 1986, p. 316). Such a metaphor as used by medical

physician William Harvey in the 1620s describing that blood in the human body was in “motion, as it were, in a circle” (cited in Garfield 1986, p. 318) was “essential to in the development of the science of physiology” (p. 318) and was proved to be accurate several decades later. Gibbs and Krause (2000) state that as “much that has to be defined or described in the electronic world is abstract, intangible and unseen ... metaphor is an obvious resource for describing the contents and workings” (p. 35). We use metaphors because our exponentially changing technological world is developing faster than our language and they can express deep levels of abstract thought, difficult concepts and ideas in a basic and simple way to reveal the underlying features of our technological dependence.

Metaphors abound in broad philosophical discussions of consciousness (Valle and Eckartsberg 1981), the nature of intelligence (Sternberg, 1990), ways of knowing (Pugh, Hicks and Davis 1997), and the gamut of educational discourse (Cameron 2003; Ross and Gray 2005). They are used both to talk about teaching (Allard, Mayer and Moss 2013; Sumsion 2003; [Vadeboncoeur and Torres 2003](#)) and, more specifically, in teaching practice (Garner 2005; Kallery and Psillos 2004; Stewart 2002; Venville and Donovan 2006). Considering their potential for application as demonstrated by historic events and their presence in books, journal papers, e-zine discussions and blogs, it is surprising that there is little evidence of them in education texts, instruction of teaching practice and supporting methodologies for teaching and learning in the areas of information technology. Metaphors are viewed as being particularly relevant in the field of information technology because it is an area where most users have very little understanding of the technology and process and as such it has to be introduced to novices first in colloquial everyday terms which are familiar to them before abstract technological terminology (Coyne 1995). Marzano (2004) is one of the few who suggests that “metaphor activities can help students better understand the abstract features of information in speaking explicitly about computer technology” (p. 75).

The above brief overview shows that metaphors are indeed ubiquitous in the area of teaching and learning, but appears to be a strategy that is not formally taught to preservice teachers arising as it does from personal need and habits. To illustrate the power of metaphoric expression and the place it occupies in media information and cyber pedagogy I offer three descriptions of explicit metaphor used in university teaching and learning situations, each centred on a technology: video recording, the internet and the generation of hypertext.

## 1. Metaphors in Describing Video Use

As part of a phenomenographic study for a Ph.D. (Penn-Edwards, 2003) aimed at mapping out the conceptions non-media users held of video recording, twenty Australian university staff and researchers were interviewed about their use of video recording in research or teaching. The interviews were unstructured and non-directive with the participants responding to a key open question: Would you please describe how you used video in your teaching/research? The transcripts of the audio recorded interviews were analysed according to phenomenographic methodology where conceptions were identified, grouped and categorized.

One group of conceptions was categorized by the use of a common metaphor where respondents described the ability of the video camera to *capture* an image of reality as being inferior, equal, or superior to the actual event. Thus a video recording was seen as being inferior to being at the actual event when only part of the actual event was captured (incomplete context) so that it provided only a sample or a segment of the event. This attracted comments such as “looking at [only] one aspect” (Interview 14) and “the opportunity for [only] one of a universe of options to be realised” (Interview 5), leaving the user with “that sneaky feeling that some students may well have been doing other things” (Interview 11) which were not captured by the camera” (Penn-Edwards 2003, p. 45).

When a video recording was seen as equal to being at the actual event it was regarded as a valuable aid to capturing a useful version of reality and a viable alternative to being an observer at the *live* event. That is, it was an all encompassing, complete record of the event. In this case metaphors such as “it’s a frozen moment in time” (Interview 3), “something concrete” (Interview 19), and something “which records everything” (Interview 6) were used (Penn-Edwards 2003, p. 46).

When a video recording was seen as being a superior experience to being present at the actual event several viewers said that it gave them more than the actual experience because it presented an optimum viewpoint or revealed hidden “inner selves” (Interview 4) allowing them to look “beneath the surface” (Interview 4) of the actual event (Penn-Edwards 2003, p. 46). It was also said that the reasoning, ideas, conceptual understandings, subtle nuances and relationships of those recorded were exposed (Interview 9, 17, 19).

The use of metaphors in these responses was probably not a conscious stylistic choice but a search for a means of describing a conception that had not previously been externalised, a means of rationalising an unconscious belief in the act of videoing as a process rather than just a tool. The variety of conceptions given above emphasises that in using video recording technology, as producer or viewer, some consideration of the conceptions that students are likely to hold is required and that discussion of these metaphoric understandings is a useful prelude to advanced production or analysis.

## 2. Metaphors in Describing the Internet

Our engagement with any resource, such as the internet, is framed by how we perceive it; and our perceptions are affected by how we describe it (Ratzan 2000). This perception, says Ratzan, is personal and from his work on the Internet Metaphor Project, he postulated that there is no *typical* Web user as we all have individual perceptions of the Internet. It was found however that there were a limited number of conventional metaphors used in describing these perceptions. The personified metaphor is amplified by consideration of the flâneur, a “man-about-town with a sense for the true character of the crowd and especially for the meaning of the city” (Hartmann 2000, p. 91); a decipherer of urban and visual texts. Hartmann created a flamboyant cyber female version of the flâneur (cyberflâneuse) for herself in her journey to “discover and potentially develop an adequate language to describe the online world(s) and their inhabitants” (p. 91). A female cyberflâneur’s “existence is geared towards social reality and contacts with others – this is her particular way of perceiving and dealing with the online world” (p. 94) and is an adroit way of explaining and characterizing a view of the online world. The cyberflâneur is an interpreter, a “decipherer of Virtual Reality and Hypertexts” (Mitchell cited in Hartmann, 2000, p. 93), or as described by O’Flynn (2003), an “investigative activist” (p. 453).

Whilst the use of metaphors is common in discussing web use, Ratzan (2000) found that they echoed the experience of the user with those employed by beginners indicating confusion or frustration, and those by expert users being “more anchored in reality” (sec. *Results* para. 7). He found that “novices tended to use finite, tangible, delimited, closed, delineated metaphors while experts tended to use more metaphysical, intangible, open metaphors ... [and that] this difference in conceptual imagery may have ramifications for the development of future Web services to target audiences” (Ratzan 2000, sec. *Discussion* para. 4).

Seventeen years ago when the majority of my first year students had little or no experience with the Internet, as part of a media studies course they were shown how to access media information and given the opportunity to explore the Internet in general. After an early hands-on session I was taken aback to have a student ask me, “Why are we doing this in media studies, this is computing?”. It seems I had assumed that the nature of Internet was apparent - that it was a technology which allowed access to a variety of information including that of media but this was obviously not the case - its nature was not implicit! I was then forced to ponder on the general understanding of what the Internet is and what it is seen to facilitate. Volunteers were called for from students and staff of the Education faculty. The forty volunteers were then given a sheet which stated that “I am interested in how people *see* the web – i.e. how they might describe the web (a metaphor)” and asked to briefly “describe how you visualize the web” (Penn-Edwards 1996). This study was repeated in 2004 with seven students volunteering and although students were, in the main, more computer literate, similar metaphors are still used.

The comprehension of users is diverse to say the least. Some believe that the Internet functions by users sending information into a net that exists somewhere out in a vacuum and users seeking knowledge hunt through this net of information which exists independently of computers and computer operators (Response 5); note that this was before the development of *cloud technology*.. Amongst the replies elicited were the following: the Net is an undefined entity - it is a never-ending well of information (Response 7), an open window (Response 3), a link (Response 2), key or skyway to the world (Response 10); or it could be visualised as a specific entity such as being like a telephone exchange (Response 4), an electronic interactive library (Response 47), a telephone yellow pages (Response 23), an encyclopaedia (Response 3), an infinite, intricate spider’s web - interwoven and multi-textured (Response 38), a matrix of intersecting pipes (Response 26), and a hydra, a multi-headed snake whose heads would grow again when cut off (Response 12). The Internet was also seen as a challenge (Response 7), as a giant game or maze (Response 30), a kaleidoscope (Response 33), an adventure (Response 10), and a thermometer with which to probe the temperatures of certain issues (Response 42). An imaginative few saw the Internet as having a complex nature: as a cross breed of a gossip magazine and an encyclopaedia with no way of knowing which articles belong to which source (Response 44); or as a very large supermarket where:

the music and lights entice you in, the ad and packages beguile you, but lots of the products are trite and tasteless, and if you have any sense you will just go in, go straight to the shelf you're looking for and come straight out again, unless you have time, in which case it is lovely to linger at the shelves of things you'd never heard of. (Response 15)

Most users were concerned over the future of the Internet seeing it as growing exponentially, gathering speed and size as it develops without structural and control measures with a lack of framework for navigation particularly commenting on the absence of guides and maps. As one individual said:

it's like a city with no town planner filled with buildings, filled with rooms, filled with filing cabinets, filled with files, filled with information but without addresses, everyone calls everything whatever they want, the map does not have a legend and the phone book is not listed alphabetically. (Response 8)

Although it is seen as useful, interesting, fun, mind-opening, a way to revolutionise education and a miracle - it is also seen as time-consuming, fearful at times, rather scary and even out of the reach of the tentative.

These types of responses have since been formally categorised by other researchers designating the Internet as a Super Highway, Digital Library, Electronic Mail, Electronic Marketplace (Stefik 1996) and listing idea sources as including the urban landscape (bus), networks (Web), the office (mailbox), violence (crash), and disease (virus) (Gibbs and Krause 2000). From a teaching and learning perspective it was the enigmatic or ambiguous way students perceived the Internet which gave me insight into their particular problems with it and allowed me to prepare an introduction to the task that acknowledged the Internet as a problematic research tool and that strategies for dealing with it need to be developed by each user. For instance, encouraging students to conceptualise the Internet as a sprawling city or legendless map led them to plan their use of the Internet and to be methodical in recording that use. This would suggest that at University metaphors would be useful with students at the starting point of engaging with technology.

### **3. Metaphors in Describing Hypertext**

As a member of a team providing a learning web site to guide preservice first year students in producing hypertext documents for assignment purposes it was found that students grasped the use of the software to create

their written documents, but that the text tended to be linear, as if it was a normal written essay and just assembled over several hyperlinked pages rather than being underpinned by the essential non-linearity of hypertext. Hypertext was defined by computer guru Ted Nelson (2003) as “forms of writing which branch or perform on request ... hypertexts consist of separate pieces of text connected by links” (p, 301) where the user decides which links to follow; that is, how to proceed through the information offered. It is a difficult concept to describe and it was obvious that a clear conception of hypertextuality was needed before students started to plan their assignment and use the software to create a truly multi-dimensional hypertextual document.

Computing technology, which has been taken up by the public faster than any other technology in history, may be seen to owe much of its success to the use of *interface metaphors* reflected in the design of visual symbolic computer screen icons in information delivery applications, such as *the desktop*, *documents*, *folders*, and *files* which allude to familiar office settings. Similar processes have resulted in *travel* metaphors allowing users to *backtrack*, or *travel forwards*, following icons and menus thus providing *trail maps mailbox* metaphors denoting written letters; artistic metaphors providing an iconic *paintbrush* to *brush* on colours; a *bucket* to fill a space with patterns; and photographic metaphors supplying *lenses* to manipulate a picture with photographic special effects.

The book format is one of the most common metaphors used in computer software, with CDs presenting many resources in this format. This format is easily understood by users of any age - even those only two years old as they are already familiar with the concept associated with books such as moving from page to page (Ellis and Blashki 2004). Young children are also familiar with using television so instead of the more familiar metaphor of a filing system as used in adult computing systems, a system was designed by Ellis and Blashki (2004) whereby the computer screen presented as an actual television with a panel of color buttons co-ordinated with the matching activity frame representing the *channel* that the child is *watching*, a volume icon as seen on remote controls, and an off/on icon button. This *televised* computer program also provided such age appropriate activities as; Balloon Popping, Peek-a-Boo, Sing Along, Three-Part-Book, Felt Pictures, Coloring Book, Ball Sort and Shape Sort.

Less than pragmatic discussions of hypertext have often used landscape and garden metaphors: for example, *In the garden of forking paths: Contingency, interactivity and play in hypertext* (Barnet, 2006) and *Hypertext Gardens* (Bernstein 1998). Descriptive phrasing of this kind can be quite motivational:

Gardens and parks lie between farmland and wilderness. The garden is farmland that delights the senses, designed for delight rather than commodity. The park is wilderness, tamed for our enjoyment. Since most hypertext aims neither for the wilderness of unplanned content, nor for the straight rows of formal organization, gardens and parks can inspire a new approach to hypertext design and can help us understand the patterns we observe in fine hypertext writing. (Bernstein 1998, *Gardens* para. 1)

However to provide a more age related visual metaphor for the first year university preservice student teachers I adopted the physically challenging and recently re-introduced game of *Twister* (Penn-Edwards 2004). *Twister* involves a mat on which is a configuration of shapes in various colours bearing a particular relationship to each other. Students were asked to visualise “a group of people in which each individual represents a *chunk* of information” (pp. 57-58). It was then explained that:

If we were to place this information into a conventional paper-based book form we would see the group of people lined up in a specific order, perhaps according to height or age. In hypertext this same group of people can be imagined playing the party game of *Twister* in which the author selects which people will take part and the color and shapes where each is required to place their hands and feet on the mat. Attempting to achieve this by twisting around allows contact with others in different ways (hip to shoulder, head to leg, and so on) and is analogous to deciding what information will be included in the hypertext text and how it will be linked. Just as there is potential for a number of [alternative] physical connections that would lead from one person to another in the game so hypertext offers a number of links between chunks of information. (Penn-Edwards 2004)

Informal student feedback, whilst not of the status of research data, indicated that providing such a metaphor early in the discussion of hypertextuality gave them a visual image of the assignment they were to undertake. Thus a difficult concept was successfully introduced in familiar terms via a metaphor.

## **Discussion**

Practical experience case studies, as presented above, illustrate the effectiveness of deploying metaphors as a way to reflect upon technology and as a teaching tool. In the overview reference was made to

metaphors covering a range of teaching and learning topics drawn from various disciplines using applied electronic technologies. Although Casnig (2009), an e-zine writer and publisher who is passionate about metaphors, suggests that “since metaphor allows for the substitution of ideas across differing areas of study, it is considered by some to be an [interdisciplinary Rosetta Stone](#)” (para. 2), there is little indication that it is academically recognised as such and appears not to be a formally recommended teaching tool outside the English discipline; it is used, but rarely directed to be used. Few textbooks seem to pay heed to the useful attributes of metaphor with only superficial oblique or inferred references, such as instructions to teachers to point out to their students “how computers need to be told things very carefully like children” (Corbel and Gruba 2004, p. 18).

An exception is the research by Woollard (2005) who proposes the use of, what he has defined as, the *pedagogic metaphor* as a teaching strategy in educating preservice computing teachers. It is clear that generally metaphors are a natural but prosaic mode of expression which can accommodate pedagogic input beyond specialist disciplines. It is already a proven means of presenting technical data and processes and it seems a logical methodology to use with supportive technologies in other disciplines.

Whilst inherent in the broad interactions of everyday life, to be effective in teaching, metaphors need to be used with due consideration to the referred objects, events or concepts that are familiar otherwise their use may be more confusing than clarifying (Garner 2005). A useful set of general guidelines is proffered by Richards et al. (1994) who suggest that:

where standard metaphors exist - use them; when a metaphor is used in several applications implement it in a standard way; use the full extent of a metaphor; avoid similar metaphors when using multiple metaphors; do not dismiss metaphors; they can be a crucial aspect of iconic interface design; overuse can be a dangerous thing; metaphors have limitations. (sec. *Conclusion* para. 1-8)

It is cautioned that there are occasions when the metaphor becomes a myth which is, says Lawler (1999), “a species of metaphor that is: (1) widely, even universally, known and used in a culture or subculture; (2) largely unconscious in nature [possibly because of (1)]; (3) literally false, or even ludicrous, when spelled out” (sec. *Old myths and new*, para. 1). In relation to computing, Lawler (1999) gives examples of how the computer is currently viewed in American culture, as a: servant (the servant problem), race (running fast), tool (software

tools), machine (car and driver), workplace (desktop), filing cabinet (file systems), and a toy (fun and games). Using such metaphors, however questionable, allow people to conceptualise a complex and somewhat threatening unknown quantity. However Lawler warns that “each of the views (i.e., metaphor themes) licenses particular kinds of language to talk about computing and has particular consequences in the culture. Each has its problems, each its opportunities” (sec. *Some examples* para. 1).

He explains for example, perceiving a computer as a *filing cabinet* means that the user expects computer files to hold similar material – a product (akin to printed papers in an office filing cabinet). However, computer files hold not only a variety of multimedia texts but also the coded instructions for the software – a process. Destroying the wrong computer file (process) can have drastic implications for other computer files (products) as products cannot exist on the screen without the software to show them. Also of note is that “metaphors are almost entirely cluster-specific, as they rely on both prior knowledge of the source domain to enable interpretation by an audience. ...Metaphors should also be culturally specific” (Ellis and Blashki 2004, p. 6), or as Richards et al. (1994) plainly state it, “if users fail to understand the implications of the metaphor (either consciously or unconsciously) then it is of no value” (sec. *Using Metaphors in Iconic Interfaces* para.6). Rohrer (1998) uses an example from the TV series *Star Trek: The Next Generation* to illustrate this point in which a character says:

Since I'm sure someone will ask ‘Why didn't the translator work!’. I'll answer it. This wasn't a translation problem - it was a conceptual, comprehension problem. All the translators in the world won't help you if you aren't thinking in even marginally similar ways. (sec. *Links to related sites of interest* para. 32 )

Without delving into the domain of figures of speech, for any one event there is a choice of metaphors and selection should be carefully considered to avoid “irrelevant or inappropriate features” (Ryall 2008, p. 364) which may be detrimental to understanding of the new event (see Ryall for a discussion of this with respect to genetic technology). This is not to say that metaphors should not be used but that “by being aware of the mesmerizing pictures that language can elicit enables us to recognize our vulnerable position even if we are unable to draw ourselves away” (Ryall 2008, p. 366).

## **Conclusion**

It is established from an overview of the literature that whilst there is evidence of the value of using metaphor in teaching and research to explore and explain new complex thought and communication processes, this occurs mainly in traditional academic disciplines and then only in conjunction with certain topics. In cases of the human interface with machines, as demonstrated in this paper in relation to video recording, the internet and hypertext, teaching and learning at the university level can be enhanced through the use of metaphor as a communication practice particularly in dealing with newly introduced concepts.

Using metaphoric language is expedient and provides for easier comprehension. It simplifies the teaching of abstractions and processes bridging the gap between the experienced academic and the novice. It also enables students to demonstrate their understandings of a conception without being limited by lack of terminology or reference to theoretical frameworks: metaphors can be explained in lay terms and colloquial expression. Teachers could consider using metaphors as a personal strategy as well as encouraging it as a means of explanation to their students.

The study of metaphors and their application is in a formative stage informed by the many aspects of human behaviour, intelligence, conceptualization and sociality and so on. Creative thinking is concomitant in this process and may foster metaphors of inexactitude as much as clarity. The author hopes to have brought to academic notice interest in supporting metaphoric expression when explaining the advantages of electronic technology and warning of the problematic use that can arise.

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