# When words fail: A case for multimodality in e-learning


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Research conducted to study the impact of learning styles in e-learning environments examined three cohorts (undergraduate e-learners, graduate e-learners, and educators working in electronic educational environments in higher education) to identify the impact of learning styles in e-learning design. Quantitative data was gathered from the research cohorts through the *Index of Learning Styles* (Felder & Soloman, 1991, 1994). In addition, qualitative responses were collected from the participants using open-ended questions via a survey questionnaire. Of the quantitative results, all three cohorts rated a moderately strong preference for visual communication over text (verbal or written communication). The results are consistent with other research findings (Felder & Spurlin, 2005), and they suggest that, at times, words do fail. These results support a case for multimodality in e-learning environments. This goes beyond situating vast chunks of text in e-learning environments and towards the inclusion of various forms of visual communication in e-learning designs. Further, it is argued, that at a time when various forms of historically text-reliant communications media are shifting towards visually inclusive constructs, that this adoption within academia is also socio-historically appropriate.

Keywords: learning styles, e-learning, visual and verbal learning, e-learning design, visual communication, multimodal and multiliterate learning environments

## Background

As a qualified and experienced educator, I had ventured into a tertiary e-learning environment as a teaching assistant. The unit was fairly conventional in terms of it being predominantly text-based. The print materials received by the student cohort at the commencement of the semester were also replicated within the electronic learning environment. Assessment in the course was via the submission of both written essays and compulsory written forum postings. This particular unit structure, with its predominant reliance on the written (and spoken) word, was not unusual from other e-learning environments that I had seen before and since.

Yet this e-learning environment was in contrast to the learning environments that I had been used to working in. I had entered the realm of tertiary e-learning, from the face-to-face teaching environment of senior secondary classrooms wherein my learning designs had incorporated a wide variety of media for both delivery of content and opportunities for learning. My doctoral research focus, which at that time was in its infancy, was ultimately to be guided by this experience: the anecdotal frustrations by some of the student cohort with their predominantly text-based e-learning environment, and my own inability to help generate a more dynamic, multimodal (involving different media and methods to deliver information) and historically-appropriate learning environment in which students could learn.

The doctoral research was eventually to examine the impact of learning styles in e-learning in order to inform e-learning design. It gathered quantitative and qualitative data across three cohorts of interest: undergraduate e-learners, graduate e-learners, and educators teaching in electronic learning environments. The data was gathered using a quantitative research instrument and qualitative participant responses. One aspect of the results generated, the visual and verbal learning preferences of the three cohorts, is the focus of this paper.

## Learning styles

The theory of learning styles is a means for both explaining individual differences in learning and suggesting how educators may best design their instructional environments so that for the students, effective learning may take place. Learning styles can be defined as the unique manner in which children and adults think and learn (Litzinger & Osif, 1993). They are the distinctive individual patterns of learning, which vary from person to person. Kolb (1984) has argued

> that the learning process is not identical for all human beings. Rather, it appears that the physiological structures that govern learning allow for the emergence of unique individual adaptive processes that tend to emphasize some adaptive orientations over others. (p. 62)

The concept of learning styles is itself a broad umbrella term. Within the field, there are over seventy identifiable approaches to investigating and/or describing learning style preferences. These in turn can be allocated into five groups, or 'families', of learning style research on the basis of their shared beliefs, as discerned by Coffield, Moseley, Hall and Ecclestone (2004). Within the broader field there is contestation, particularly due to the lack of agreement between the various 'families' of learning styles, the underlying philosophies that the various families may hold, and also due to claims made by some supporters, and the protection of commercial interests by others. Nonetheless, the area of learning styles is an area that continues to invite further investigation, and scholarly appraisal (Felder & Spurlin, 2005).

The five 'families' of learning styles research range from those who are based on a premise that learning styles are genetically or constitutionally based at the one end of the spectrum, to those who consider learning styles to be part of a broader conceptualisation of learning approaches, strategies, orientations and conceptions of learning, at the other (Coffield et. al., 2004, p. 10).

## The *Index of Learning Styles* (*ILS*)

One such data collection instrument to investigative learning styles is the *Index of Learning Styles* (*ILS*) (Felder & Soloman, 1991, 1994). The *ILS* is part of the fourth family on the learning style continuum. This group of learning style models consider learning styles to be flexibly stable.

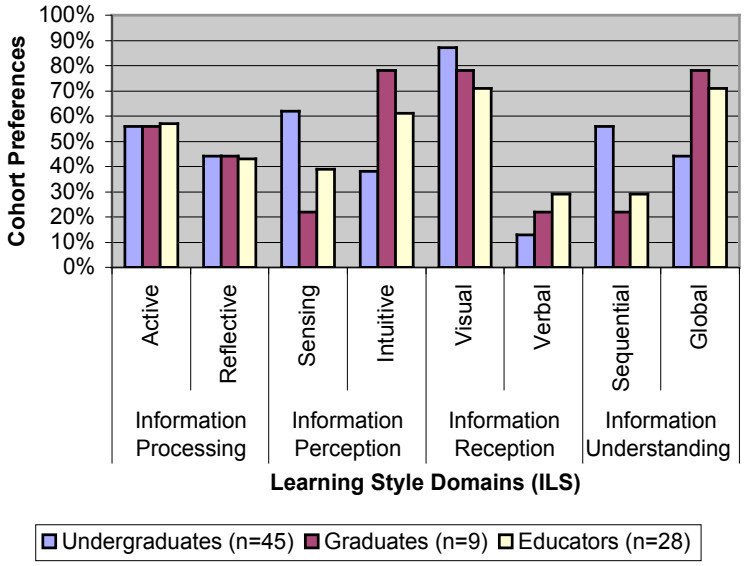
The *ILS* is a 44 question, freely available, multiple-choice learning styles instrument, which assesses variations in individual learning style preferences across four dimensions or domains. These are Information Processing, Information Perception, Information Reception, and Information Understanding. Within each of the four domains of the *ILS* are two categories respectively: active/reflective, sensing/intuitive, visual/verbal, and sequential/global. However, rather these parings being understood as being two discrete preferences, each domain is a continuum, with individual preferences rated as a weak, medium or strong preference towards one end of the spectrum or the other. Thus, for example, the variety of possibilities on the visual/verbal domain, for example, can range from a strong preference for visual information at one end of the continuum, to a strong preference for verbal information, at the other.

## Methodology

Due to the ease of its implementation, the *ILS* was chosen as the quantitative data collection instrument for the doctoral research in e-learning. Three cohorts were selected for analysis. Following invitations to participate in the research, forty-five undergraduate e-learners, nine graduate e-learners, and twenty-eight educators working in e-learning environments participated. In addition to the *ILS*, participants also completed a survey questionnaire in order that qualitative feedback of their self-perceptions of the impact of learning styles within their e-learning environments could be gained. The results from these three cohorts across each of the four domains of the *ILS* were then compared and contrasted.

## Research findings

The quantitative results of the research were considered significant. Whilst only the findings relating to the visual/verbal domain will be described in this paper, the quantitative results of the study across all four domains are included in Graph 1: Learning styles results across four domains**.** Of focused interest in this paper are the results in the third domain of Information Reception: of learning preferences for visual (images, graphics, etc.) and verbal (the spoken and written word) communication. What stands out in these results is the alignment of preferences across all three cohorts for the visual communication of information over the verbal (text-based) communication of information.



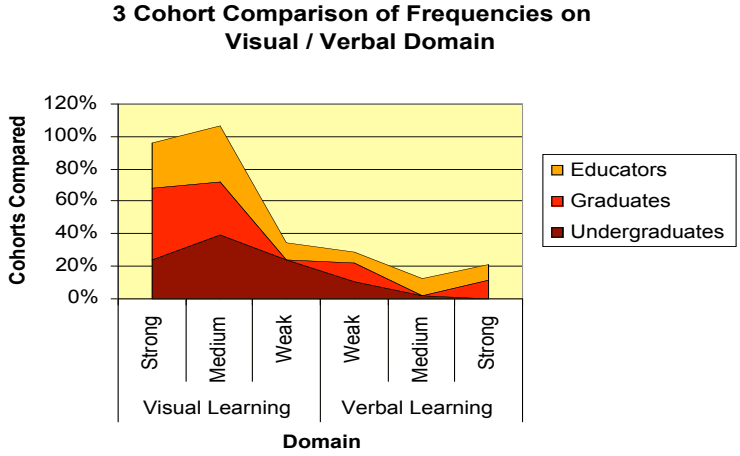

**Graph 1: Learning styles results across four domains**

The specific breakdown of the results across in the three cohorts along this specific visual/verbal continuum of the *ILS* is recorded in Table 1. In all three cohorts, there is a predominantly strong to medium preference for visual information, and this has implications for the best means to learn and retain new information.

**Table 1: Results across 3 cohorts**

| Cohorts | Visual Learning Preferences | | | Verbal Learning Preferences | | |
|---|---|---|---|---|---|---|
| | Strong | Medium | Weak | Weak | Medium | Strong |
| Undergraduate e-learners (n = 45) | 23.9% | 39.1% | 23.9% | 10.8% | 2.1% | 0.0% |
| Graduate e-learners (n = 9) | 44.4% | 33.3% | 0.0% | 11.1% | 0.0% | 11.1% |
| e-Educators (n = 28) | 27.6% | 34.5% | 10.3% | 6.9% | 10.3% | 10.3% |

The strength of preferences for visual information over verbal information of the three cohorts in Table 1 is graphically represented in Graph 2.



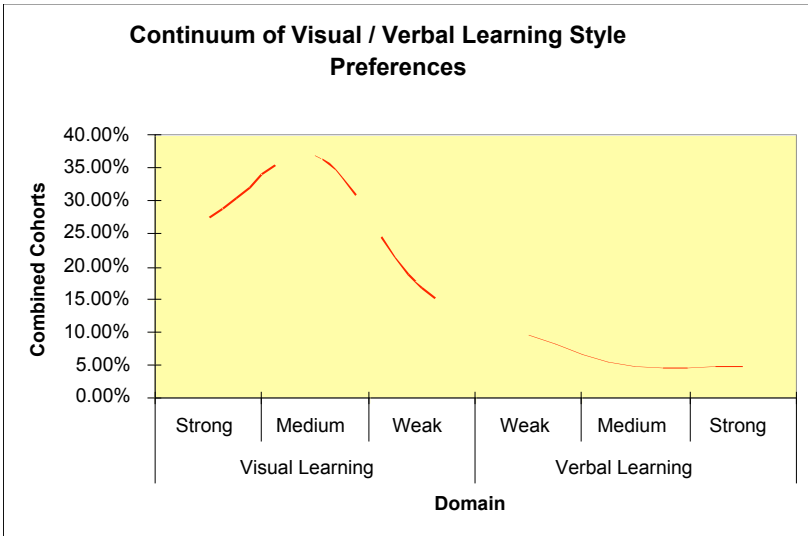

**Graph 2: Results across 3 cohorts**

The results from the three cohorts were then averaged to find an overall strength of preference in this learning style domain. Table 2 and Graph 2 represent the mean, suggesting the moderate preference for the undergraduate e-learners, graduate e-learners, and educators for learning environments that included visual communication.

**Table 2: Combined mean scores on the visual / verbal domain**

| Dimension of *ILS* domain | Visual Learning | | | Verbal Learning | | |
|---|---|---|---|---|---|---|
| Strength of preference | Strong | Medium | Weak | Weak | Medium | Strong |
| Combined mean of cohorts n = 82 | 27.4% | 36.9% | 16.7% | 9.5% | 4.8% | 4.8% |

The results from Table 2 are graphically represented in Graph 3.




**Graph 3: Combined mean scores on the visual / verbal domain**

Prior to the discussion of these results, it is worth reflecting on a number of questions. What do the results of the research suggest about learning style preferences in e-learning environments in terms of visual and verbal communication? Are these results reflected in the construction of e-learning environments? What may be the impact to learners if they are taught in heavily mismatched learning environments? And how can these results inform the construction of e-learning?

## Discussion

The quantitative results from this study are similar to other findings in a range of other academic contexts using the *ILS*. For example, Felder and Spurlin (2005) cite thirteen different published studies that have used the *ILS* to assess various academic cohorts in a variety of contexts and sectors. All report similar preferences for the communication of visual information amongst undergraduates, graduates and educators. These results seem to reflect the rise in prominence of visual communication in this day and age and the embrace of multimodal communication.

The question then becomes that if all cohorts – undergraduates, graduates and educators – all have a preference for visual communication in learning environments, are such results reflected in the construction of e-learning environments? Why do learning designs continue to be fixated on a predominant transmission of verbal communication over communication of content via visual means? It is a heavy mismatching of the delivery of communication within the learning environment to the preferred preferences of those who learn, and teach, within them. Why is this so? Part of the answer may lie in lack of consideration of individual learning style preferences as a pedagogical design tool so that we teach in a balanced manner.

### Text, text, and more text

In some e-learning areas text-dense information continues to be the main means of communicating information and learning materials to students via electronic means, despite the socio-historical changes occurring simultaneously in other media formats. Our culture is so media-rich that in insisting on replicating learning through and by words alone is out of step with the rest of society. This leads us to the

debate about high culture and low (popular) culture in which the printed word is still considered in some circles as paramount to visual media forms (George, 2002, p. 31). Indeed, academia can be considered the bastion of text.

Text isolates its readers. It is usually read silently and draws the reader/writer away from social situations because it requires them to focus intently upon the media of delivery. This isolation occurs unless the text is shared and read out loud within a group of people for their mutual interest (or requirement). Kress (1997, pp. 16-17) writes that writing and the consumption of the written word requires space and spatiality.

Further, this perception of academia as a simultaneously text-dense and isolating learning experience exists within the broader community. Recently a mature-aged acquaintance was discussing the possibility of her commencing tertiary study to gain employment security. It was suggested that due to her rural locale, and the reality that she needs to be available for her children both before and after school, that she considered distance education via e-learning. She replied: "I really want to study. I really do. But I could not do distance education. I am such a visual learner." What lessons can be learnt from such comments concerning one's self-understanding of their own learning style preferences so that e-learning environments may be inviting for them?

## Learning styles: make 'intuitive sense'

Despite the contestation over the field of learning styles within academia, as previously pointed to, Coffield (2007) has argued that the pervasiveness of the notion of learning styles is specifically because of its intuitive appeal. It makes sense. Comments such as the one from a potential student over preferences for 'visual' over 'verbal' learning environments, and the lack of choice that academia still tends to offer, were reflected in the qualitative responses recorded on the study's survey questionnaire. Participants would happily adopt such descriptive labels for themselves as a "visual learner" or as a "verbal learner", or even, "I am both visual and verbal". This also supports the findings that whilst learning styles may be considered an area of debate within academia, it is considered to be a part of common sense knowledge in everyday self-perceptions.

Comedians, whose job it is to highlight individual differences in their comic routines, build upon this shared common knowledge. They generate laughter because the audience recognises the existence of these individual preferences in day-to-day reality. Take for example, the classic opening scene from "The Hotel Inspectors", the fourth episode in the first series of the BBC sitcom, *Fawlty Towers* (Cleese & Booth, 1975). The authors have based the sequence entirely on the opposition of two alternative, but equally strong, personal preferences for verbal communication and for visual communication. In this scene, the proprietor of the Torquay guesthouse, Basil Fawlty, is attempting to look after the needs of his guests in his usual unendearing manner. Mr Cummings arrives at Reception to enquire about directions for a meeting in downtown Torquay that is scheduled for later that afternoon. Mr Cummings asks Basil to draw him a map, a visual diagram, of how to get to his meeting. Fawlty replies that the directions are quite easy, and proceeds to list the directions to his guest, using verbal descriptors. Mr Cummings interrupts by thanking Fawlty, but repeats his request that he would rather have a map drawn for him. Fawlty continues, undeterred, by insisting that his verbal instructions really are very easy to follow, whilst Mr. Cummings insists that he needs a visual map drawn to help him find his way to the destination. They face off against each other, semiotically positioned on either side of the reception counter, each opting for a different variant of what is in essence the communication of the same information.

This same stance can be found in learning design, where an adherence to one particular format, text for example, can inadvertently cause confusion and/or frustration for the intended recipients of the learning design. Thus whilst learning style preferences are recognised in our day-to-day lives, they are often not factored in to learning designs within academia to the extent that what is delivered can often be a one-size-fits-all, text-dense approach to learning design.

## E-Learning: Beyond a one-size fits all approach

Thompson (1997) argues that the mass media commodifies the message by making it part of an institutionalised production and dissemination process, and as such is part of the economic capital of a society. At times reminiscent of other forms of mass communication which produce one product for mass consumption, the e-learning product in some scenarios can be considered a form of economic rationalism, rather than one which is suited to the varied needs of the student cohort in a particular period of time. Such forms of e-learning are considered standardised if they deliver material predominantly in one

manner. Dubbed the 'one-size-fits-all approach' to learning environments, this may be expeditious, perhaps even convenient, but it does not recognise that learning is a uniquely individual phenomena. Jorgensen (2004) writes

> One size fits all is a phrase I have come to loathe. It is frustrating enough when it is applied to clothing because we all know that people come in a variety of shapes and sizes, but worse when it is unconscionably applied to teaching and learning. This phrase is an indication that we do not fully acknowledge the individuality of each and every learner. (p. 212).

In order to acknowledge individuality, we need to teach in a more considered and balanced approach, and considering the results of this research, in a manner that is more visually inclusive.

### Visually inclusive communication and multimodality

The rise of importance of visual communication highlights the socio-historical transition from literacy as a referent to the ability to read and write fluently in a particularly language, to multiliteracy, the ability to effectively communicate in a plurality of competencies across a broad range of communicational formats, including visual communication. In relation to this, Kress (1997) suggests that literacy, as we have come to know it over the past century, is becoming an increasingly unstable phenomenon for within this environment of instability, the dominance of text as the preferred medium of communication is being challenged. He writes

> there are changes in the landscape of communication which are having far-reaching effects on the use, valuation and place of language. Modes of communication, other than language, are becoming increasingly prominent and even dominant in main areas of public communication in which language was formerly used exclusively or dominantly. This is true of visual images in particular. We are, it seems, entering a new age of the image, a new age of hieroglyphics; and our [education] system is not prepared for this in any way at all. (p. xvii)

Kress further believes that this shift will have far-reaching social, cultural and cognitive effects (p. 10). George (2002) explains how. She writes

> For students who have grown up in a technology-saturated and an image-rich culture, questions of communication and composition will absolutely include the visual, not as attendant to the verbal but as complex communication intricately related to the world around them. (p. 32)

This shift from literacy as the ability to effectively communicate through verbalisations, to a multimodal and multiliterate society is being evidenced in numerous media in our day-to-day lives. Take for example, the recent switch in e-mail options introduced by the Qantas Frequent Flyer Rewards in which customers are offered the opportunity to switch from receiving their e-mail updates from the current plain text option (text-dense) to receiving e-mails that incorporate both text and images (visually inclusive e-mails). Whilst both e-mails convey the same information, the benefit of the visually-inclusive format over the text-only option first is that the image can be quickly scanned for meaning even if the text is not, or cannot, be read. Such e-mail formats offer a choice for the recipients.

The print media has long been ahead of its e-mail counterparts in its adaptation to such socio-historical shifts. The Age newspaper, from Melbourne, Australia, for example, which was text-dense in 1854, had become visually inclusive well before its one hundredth birthday, and is of course available now by both print and electronic formats, incorporating both text and visual communication options, and audio-visual in the electronic variant.

This then is the socio-historical backdrop to current e-learning environments in academia. With the adoption of visually-inclusive communication within conventional media environments and within other traditionally text-reliant electronic media on the global stage, the time is right for e-learning to shift from its reliance on text to multimodal options. As Kress (1997) notes

> I suspect that the information explosion, and 'information overload', are effects of and are produced by the potentials of the written medium, which is, however, no longer capable of serving as an efficient or sufficient mode of analysis, display and integration. The 'training' which children receive in front of their fast-paced programmes, or in the electronic fun parlour, or, in the case of the more affluent child, at home with video and computer games, may turn out to be among the most useful and essential that they receive. (pp. 4-5)

Multimodality is the new literacy. As such, the continued production of text-only, or text-predominant e-learning environments is not a satisfying approach to learning design. Moreover, it is outdated. Is it time then that we seriously promote a shift from text-dominance in our e-learning design and consider the inclusion of visual communication in e-learning environments?

## Beyond words

Shaun Tan, the winner of several Australian literary awards, including the Australian Book of the Year for Older Children 2007, has recently upset the literary community as a consequence of the acclaim received for his illustrated book without words: *The Arrival (*Tan, 2006). In a press article entitled "Literature is more than words", Schiovone (2007) notes that part of the unrest on the part of some of his critics is the argument that visual images, such as Tan's illustrations, are not, and cannot be considered, literature. Moreover, they have argued, a book without words is unworthy of such acclaim. Yet the amount of awards won by this book suggests the antithesis: that, indeed, literature is more than words, and *The Arrival* powerfully tells a story.

Tan (2007a) describes his work not as a 'picture book' but as a 'graphic novel', and notes that the evolution of his idea about being a foreigner in a strange new land (perhaps like being a new student in a virtual environment?), transposed into a literary work without text:

> the absence of any written description also plants the reader more firmly in the shoes of an immigrant character. There is no guidance as to how the images might be interpreted, and we must ourselves search for meaning and seek familiarity in a world where such things are either scarce or concealed. Words have a remarkable magnetic pull on our attention, and how we interpret attendant images: in their absence, an image can often have more conceptual space around it, and invite a more lingering attention from a reader…

Further, he notes that images, such as photographs, drawings and the like, "work by inspiring memory and urging us to fill in the silent gaps, animating them with the addition of our own storyline." (ibid) Examples of Tan's graphic novel can be found at http://www.shauntan.net/books/the-arrival.html (Tan, 2007b).

Such comments relating to visual communication's ability to help promote the viewer/reader's own construction of meaning also align with constructivist pedagogies. Constructivist approaches to teaching and learning believe the individual learner as an active participant in the construction of "knowledge by integrating new information and new experiences into what they have already come to understand, revising and reinterpreting old knowledge in order to reconcile it with the new learning." (Gottlieb, 2000) This suggests that, irrespective of how information is structured and sequenced by the educator, learning will be more meaningful for learners if they have the opportunity to discover the connections on their own. Moreover, a constructivist approach "acknowledges that students develop their own styles and preferences for using a variety of different resources" (Brennan et al, 2001, p. 50) in learning. Correspondingly, constructivist instructional design is concerned with fostering individual learning, and providing choices for learners and learning.

## A cautionary note

The argument of this paper has been to propose the inclusion of visual communication in text-based e-learning so that it becomes a fully multimodal, multiliterate, and well-rounded learning environment that can adequately cater for a broad range of learner preferences. It is not, however, to be interpreted as a suggestion that text is, and should be made, redundant. Indeed, verbal communication is also a necessity to promote learning. Both provide a balance. As Kress (1997) has cautioned, that despite the need for the incorporation of visual communication in learning design, it is still crucial that learning includes instruction via verbal media:

> [w]riting will remain an important medium of communication, and is likely to become more and more the medium used by and for the power élites of society. This makes it essential to facilitate the access of every [student] to the maximum level of competence in this medium… (pp. 147-148)

Beyond social stratification, there are of course many other reasons why people might choose to receive text-dense communication, even if they do prefer visual learning, and this should be their option. Both are

related to equity issues. One is the download size of multimedia files in comparison to text-only files, or the cost associated with printing anything other than printed communication. The other relates to the visually impaired, who may be reliant on text-recognition technologies for the mediation of their learning content.

## Conclusion

The results of this research have suggested that undergraduate e-learners, graduate e-learners and educators working in e-learning environments all prefer visual communication in their learning environments. This finding supports the assertion that we are shifting from an age where text as the baseline of literacy is becoming outmoded, and moving towards an era of multiliteracies; a socio-historical juncture wherein visual communication takes on as much, if not more, of an importance in the electronic age.

The conclusion is that words do fail sometimes in e-learning environments, and that as educators and designers of electronic learning spaces, we need to be prepared to offer variants for what has become in other media forms – even literature itself – an outdated mode of communication: text. To provide learning space in which both text and visual variants of communication is to provide a balance, a place in which all may learn.

### Postscript

The original version of this paper was visually rich in order to emphasise and document the points being highlighted in this text for the need for multimodal teaching environments that are visually inclusive. However for the purposes of publication, some of these images have been removed. Copyright restrictions, and hurdles for allowing inclusion of various images in the published form of the paper, highlight a challenge to presenting visually inclusive environments for research, teaching and learning. Consideration has to be given as to how such copyright challenges of the visual image may be overcome in order for the creation of rich, multimodal, multi-literate teaching and learning environments.

## Acknowledgements

The author wishes to thank the ASCILITE 2007 Program Committee, the paper's three reviewers, and the Monash copyright officer and solicitor, for their guidance in the refinement of this paper.

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**Please cite as:** Willems, J. (2007). When words fail: A case for multimodality in e-learning. In *ICT: Providing choices for learners and learning. Proceedings ascilite Singapore 2007*. http://www.ascilite.org.au/conferences/singapore07/procs/willems.pdf