

Affective and Cognitive Domain Learning with Multimedia: Two Sides of the Same Coin

David Goldfayl

*Department of Communication and Language Studies
Victoria University of Technology
dgoldfayl@essex.vut.edu.au*

Abstract

This paper will discuss the need to incorporate affective domain considerations at the design and development stages of the creation of multimedia materials. It will be argued that strictly cognitively based theories of teaching and learning which have evolved throughout and alongside the various incarnations of Computer Based Learning cannot, and do not, fully address the needs of multimedia users at non-cognitive levels. Work practices which have evolved in Educational Television pre-production processes are proposed as being more appropriate for multimedia teams.

Keywords

affective domain, multimedia, content design and development, educational television, work practices

1. Introduction

Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information?
T. S. Eliot *Choruses from 'The Rock'*

All experience is framed in terms of our perceptions of it and, regardless of the context, our perceptions of experience are primarily characterised in terms of our emotional responses. Yet, in spite of this, affective domain factors remain almost completely neglected in the design and development of learning materials in general and of multimedia (MM) projects in particular. This undervaluation of the impact of affect is not inevitable, nor is it surprising, given the lineage of pedagogical practice within the mediating technology itself.

2. Historical Background

The narrow piers which, anachronistically, still seem to form the theoretical foundations of the implementation phases of MM materials are largely due to the quirk of historical circumstance (Salomon 1978). This is equally true of the design and development phases. Multimedia (MM) is, in all respects, a 'bastard' technology with several putative fathers. What is certain, however, is that it was fostered by and developed through the Computer Based Training (CBT) and Computer Based Learning (CBL) paradigms (Barker and Tucker, 1990). This conceptually mechanistic and, literally, highly engineered background has left its mark. However, the overall influence of this background is well past its 'use by' date and is as relevant today as the Hullian or Skinnerian rat-and-machine models of human behaviour in education (Frankl, 1979; Greeno, 1980). Which is to say, only to

some minor extent and only in some limited circumstances. Indeed, Tucker (1990 p. 25) has described CBT as ‘narrow pathways laid down in dark forests by long dead teachers’.

Rapid generational change within this field of applied learning technology is and, for the foreseeable future, will remain the norm. In such an environment the danger for educators and educational technologists who fail to come to terms with content design and development is, simply, to miss the boat. This could very easily lead to the community of ideas having little voice, no voice, or merely offering a belated murmur from afar. It is perhaps time that more educators radicalise their approach to content in terms of learner engagement with materials, and in so doing, begin to lead from the front.

3. Affective domain and learning

The proposition that affect guides emotional responses, by now a concept over three decades old (Tomkins, 1961), seems to remain unchallenged in the literature. This is in no small part due to it being mostly ignored. However, the literature which does address this central area suggests that affect and cognition are inextricably intertwined in learning processes (Bandura 1989; Basch 1976; Csikszentmihalyi 1990; Hidi and Baird 1986; Iran-Nejad, 1987; Lazarus 1984; Meyers and Cohen 1990; Romiszowski 1989; Zajonc 1980, 1984). The clear indication is that design and development which addresses only one aspect of learning processes without attending to the other neglects a major component of any ‘recipe’ for success. Yet this is, by and large, the current state of affairs. It remains a curiosity that this occurs concurrent with such a broad-based acceptance of the proposition that ‘... emotions may influence cognition at least as much as cognition influences emotion’ (Meyers and Cohen, 1990, p. 483). While it is beyond the scope of this paper to fully explore the reasons for this, it does seem that the overall neglect of affective domain factors in existing pedagogical models may simply be due to them being:

- difficult to describe in design terms;
- threatening to self-conceptions of ‘serious’ educators;
- seen as window dressing and not a part of ‘serious’ scholarship;
- difficult to quantify in educational evaluative terms;
- representative of a type of research which does not readily attract funding.

Iran-Nejad, Clore and Vondruska (cited in Iran-Nejad, 1986, p. 180) go further, and suggest that the low or non-profile given to affective domain factors in most teaching and learning models is partly attributable to cognitive theory being ‘lax in integrating a pragmatic perspective into its purely structural approach’. It is unnecessary and, simply, wrong-headed to demonise empiricism. However, perhaps there has been, to date, an overly mechanistic influence in computer-based learning materials. Whether or not the origins of this phenomenon reside in scientism’s artificial sequestering of the overlapping spheres of human experience is a moot point. However, what does seem incontestable is the common-sense veracity of Tomkins’ (1980, p. 208) proposition that we are ‘bio-psycho-social’ beings. Indeed, no evidence has been found within contemporary literature which directly questions, let alone challenges, the underlying beliefs of this holistic approach to learning and learners.

4. Entertainment or Education?

Affective domain factors remain the poor cousin in the various debates concerning learning. However, if the apparently irreversible move toward learner-centredness is to become more highly refined and responsive, then there is a need to tackle, head-on, the highly problematic issues of entertainment versus education (Bigum *et al* 1993). The friction which is inherent in this area is immense. However, it need not generate only heat, but it should also generate some light.

The artificial Balkanisation of entertainment and education within educational technology has unnecessarily polarised materials into separate camps. While there is an obviousness to the statement that 'learning and enjoyment are not mutually exclusive' (Daningburg and Schmid, 1988, p. 185), it nonetheless, seems necessary to re-state this truism. Materials on the entertainment-education continuum often seem to be situated in an uneasy alliance. At one extremity, we find strictly cognition orientated materials with dry and unengaging content for the learner while, at the other end, we find materials which seem driven by high-technology aimed at the middle-brow which are of low educational value. Naturally, neither of these outcomes is inevitable and, in fact, materials often fall somewhere short of these distal extremities. However, even a scant survey of current materials suggests that, with some notable exceptions, there appears to be a definite alignment at the design and development phases to either the educational or entertainment end of the scale. The choice is not and should not be between 'unremembered pleasure' or 'more matter with less art'.

4.1 Edutainment?

The ugly neologism 'edutainment' presents a nettle for grasping by all educators and educational technologists with a genuine interest in learning that incorporates MM materials. Given that we frame our cognitive processes in relation to our feelings and values at the sub-cortical level (Basch 1976; Edelman 1989), that is, at the ancient 'lizard' part of our brain, then it becomes clear that educators are never really faced with the spurious choice between either the steak or the sizzle. If the basic educational demand of positive engagement of learners at the affective level is to be gainfully addressed, then this should clearly take its place as an *a priori* principle of design and development and not as an optional extra or *post facto* add-on. However, the successful creation of such materials requires a highly skilled balancing act - on the one hand, interest and intellectual activity and, on the other, liking and positive stimulation of the affective domain. That they are interconnected effects makes the task no easier (Iran-Nejad, 1987).

Perhaps 'edutainment' may not even be the appropriate term for consideration, since this suggests overtly entertaining learning material, and little else. Affective domain considerations are not tantamount to colour-and-movement with bells-and-whistles. What affect refers to is the full range of learners' emotional responses, some of which are completely at odds with any notion of frivolous entertainment and its associations with dubious educational content. Moreover, if lists of primary affective responses are examined, it becomes clear that only a minority of affects are what could be considered as 'positive'. For example, Tomkins (1980, p. 325) cites nine central affects, however, only three of them, that is, interest, enjoyment and surprise are 'positive' in nature. These three 'positive' affects are, of course, outcomes likely to be achieved by successfully entertaining materials. This type of engagement offers absolutely no guarantee of cognitively meaningful interaction taking place, yet neither does it suggest that it will not take place. The 'negative' affects cited by Tomkins are fear, anger, distress, shame, contempt and disgust. What remains clear and central is that instances where any of these 'negative' affects are elicited by MM, this will almost certainly guarantee that cognitively meaningful engagement will not take place. The double-edged sword of affect can also be a very blunt instrument.

5. Considering affect in design and development

Mediating technology clearly impacts upon the nature and the qualities of interaction through each medium's own framework of codified meanings, representations and associations. Certainly, a massive body of quantitative and qualitative evidence implicitly and explicitly refutes Clark's (1983) media-as-delivery-van metaphor (e.g. Adams, 1987; Bates, 1988; Duby 1991; Kozma 1986; Lindsay, 1988; Petkovich and Tennyson, 1984, 1985; Salomon, 1976, 1978, 1983, 1984). Perhaps the sheer weight of numbers has finally quelled the media-attributes debate. Indeed, there appear to be far more fruitful pastures to explore.

Adams (1987) suggests that educational technologists may have isolated themselves from a vast array of research which could enrich the field and its overall output by more closely considering the findings in other electronic media. Such areas as Educational Television (ETV) and Distance Education (DE) are obvious candidates for inclusion. There exist over two decades of investigative findings from the Open University (UK) alone which address creation, distribution, design and production factors televisual materials in learner engagement and in learner outcomes. However, these and similar resources are, too often, conspicuous only by their omission within theoretical discussions concerning MM. If, as Santayana suggests, progress consists of more than change but also depends on retentiveness, then perhaps this indicates the need for a more eclectic, yet still pedagogically sound, theoretical and pragmatic approach toward the creation of MM learning materials. This seems entirely appropriate and in complete accord with the nature of such an eclectic medium.

Serious minded learning need not be treated as being only of the strictly cognitive, furrow-browed kind. However, there are instances where this approach may be more appropriate than others. Naturally, there are times when learners do not want to engage in anything but quick and easy information retrieval, although this should be as intuitive a human-computer interaction as is possible. However, this does not suggest a truly interactive medium in any real sense; and certainly not in the sense meant by Tucker (1990, p. 28) who posits that:

Interactive multimedia implies the creation of a knowledge-based learning environment in which the developer, teacher and learner exist in a symbiotic relationship.

The question is begged then as to what role the creators of MM learning materials should, in fact, play during the design and development phases. Broadly speaking, this should not substantively differ from the role which they play in the preparation of any other learning materials. However, the very nature of the MM environment does alter two central factors, that is, learner preconceptions of the medium and awareness and use of the emerging presentational qualities. Both of these areas will have immense impact on the level and quality of affective engagement of learners and, as such, need to be addressed at the earliest possible time in the life of an MM project.

5.1 Preconceptions

How learners perceive any medium will impact greatly upon the amount of mental effort they invest (Salomon, 1984). However, merely to accept this as a *fait accompli* is to resign oneself to an immutable yet untenable position. It remains incumbent upon creators of educational materials in general, and MM in particular, to clearly and unambiguously frame the content in such ways that it is not only appropriate to the affective needs of learners, but also to the type of cognitive demands that will be expected of them. This naturally means knowing one's target population well and incorporating iterative feedback processes throughout the early formative evaluation so as to fine tune content accordingly.

A useful guide may be Duby's (1991) proposition that ETV producers should draw upon popular and accepted television styles and formats. The overall approach that this points to for MM may

offend some educators' sensibilities, as it might seem analogous to supping with the devil. However, this may be a safer option than standing at the shore commanding the incoming deluge of technology to halt. It is no idle fact that almost all new computers are now sold to the domestic market with in-built CD-ROM players, and that most of these are primarily used for near-arcade quality game-playing. This suggests an increasingly powerful impact upon learners' preconceptions of the medium when encountering MM with genuine educational objectives. Overly dry educational content does not seem to be any kind of answer to this. Rather, it seems that the judicious adoption of appropriate popular presentational forms and genres will most likely offer the best results in terms of learner engagement.

5.2 Presentational qualities

Due to the very newness of the medium, there are few symbols and codes in MM which can be taken as read. Unlike television or cinema, MM is in its presentational infancy. However, the historical development of the already existing audio-visual media suggests that new media will initially draw heavily on already existing codes within the forms most similar to it. Consider, for example, the rigidity and stage-like qualities of early cinema. Hence, it is essential that creators of MM materials be up to date with current modes and methods of communicating within, as well as around, the field of MM. This means much more than mimicry of already proven successes; what will increasingly be required in MM teams is actual expertise in adaptation *and* application. Anecdotal evidence suggests that this is, currently, rarely the case. The 'language' of MM will, undoubtedly, become increasingly sophisticated and complex as it continues developing over time. It will remain the responsibility of MM teams to be highly skilled and fluent communicators in the language of the medium and to remember that, like any other language, it will continue evolving.

Learners will, in all likelihood, continue to have increasingly high expectations regarding the standards and quality of MM production. However, most institutions cannot, and perhaps should not, attempt to compete at that level with multi-national corporations that can afford to allocate six and seven figure sums to a single project. Paradoxically, there are stark lessons to be learnt from the past regarding the production of technically low quality educational materials using electronic media. Hopefully, these types of mistakes will not continue to be repeated with newer media.

What remains constant across media is the need to carefully and critically consider the qualities and attributes of the ideas well before production begins and not trust to the magic of the medium to somehow bring a partially developed idea 'up'. The base-line production expectations and demands from learners will become clearer over time. Within that emerging framework, the content and how it engages learners will remain of primary importance to the success of MM materials.

6. Work Practices

Current anecdotal evidence suggests that Australian MM work practices in education are similar to those found elsewhere. That is, the project team's skills will generally involve expertise in evaluation, content matter, instructional design, programming and graphic design. However, given the centrality of affective domain engagement to learners' cognitive engagement, where is that expertise in such teams? Certainly there exist educators, designers and developers who have skills adequate to the task, but they are the exception and this leaves too much to good fortune rather than good management. The types of expertise indicated above are, in part, a reflection of the impact CBL on MM. It is hardly surprising, then, that there is a transposition of its work practices, too. However, as was the case with much of the input of CBL, the composition of many MM project teams simply does not directly address the important aspects of affect.

Interestingly, the lack of affective domain expertise in design and development phases may also be a reflection of another aspect of MM's lineage, that is, institutionally created educational videos.

Certainly, cost and time pressures of project management are undeniable factors in materials production. However, unless materials engage learners affectively, such projects will often continue to come in on time, on budget and on shelves, gathering dust. Why does this seem to occur so often? Perhaps Gardiol-Gutierrez and Boder's (1992) research into educational MM producers' work practices in Europe may shed some further light on this question. Their analysis shows that 'efforts are directed towards the implementation phase, whilst the decision and planning phases receive only secondary attention' (Gardiol-Gutierrez and Boder, 1992, p. 127).

6.1 Alternative Work Practices

Perhaps ETV offers some different ways of approaching the formative stages of materials production. The structure, team composition and processes of ETV pre-production represent work practices which have evolved over a considerable period of time, and bear great relevance to the demands of MM. Like MM, making even a short ETV program is an expensive and time consuming activity. The production qualities that it projects are very quickly judged by learners. It can offer vicarious experience by taking viewers to places, events and times that otherwise may not be possible. Events can be seen differently than in real life, such as slow-motion. Connections and grounding can be succinctly made through auditory, visual and textual information and cues. Indeed, there are many other similarities between these media. However, it is the complexity of these and other factors which necessitates more than a passing sensitivity and skill in eliciting appropriate affective domain factors in learners.

Clearly, such choices must be made early in the decision making processes, since changing them after or during actual production is both time consuming and expensive. To make these decisions in a timely manner, ETV programs often include experienced professional script writers very early in the pre-production stage. This ensures that their expertise and skills in combining affective and cognitive factors are part of the iterative processes of design and development. Whether they are brought back at a later stage of pre-production or continue their involvement through to completion will vary from project to project. However, bringing writers into teams at a later stage excludes expertise that is essential to the potential success of materials. Late inclusion is tantamount to utilising higher-order skills for little more than typing. Within the framework of achieving a project's educational objectives imaginative exciting and creative inter-connections can be made during pre-production brainstorming sessions which include all major contributors to a project. These skills are not the exclusive domain of writers, however, it is one of their main areas of expertise which they hone over years through daily practice. Since insight and understanding occur at the deepest levels when learners are affectively engaged (Izard *et al* 1965) then writers are an essential resource for the design and development of successful MM projects.

7. Conclusion

If the underlying elements of design which incorporate deeper understandings of the co-creation of meaning and pleasure in MM within learning environments are to be implemented, they also need to be more closely considered. Certainly, this means more theoretical exploration and, indeed, research into successful practice. However, there is also an overarching need for an increased awareness by practitioners of the importance of affective domain engagement with learners. Furthermore, this needs to be turned put practice. This demands that MM producers display a different type of pragmatism, one that sees a willingness to loosen the reins a little and guide, rather than direct, projects so as to ensure that they meet their intended objectives. All team members will certainly need to be fluent within the medium. However, specific expertise in content presentation and its affective impact needs to be considered and acknowledged in altogether different ways if MM materials are expected to excel.

As far as it is possible to conceive of multimedia at this point in time, it will remain a mediating technology between the user and the design team which creates it. One of the real values of this form of communication would seem to lie in its potential ability to increase its technological 'invisibility', while incorporating the psychosocial elements of the real world and the real self within the context of a virtual world and metaphorical self. It is hard to imagine how this can usefully and purposefully occur until matters of fantasy, play, pleasure and narrative are directly addressed by creators of MM.

8. References

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