OVERVIEWING THE FUNCTIONING AND DESIGN OF EDUCATIONAL VIDEOS AS VISUAL AGENT TO INCREASE LEARNER-CENTRED ENGAGEMENT

Stephen T.F. Poon
The Design School
Taylor’s University
stephentfpoon@aol.com

ABSTRACT

The use of video as an instructional and learning medium has grown over the last three decades. While its access to a wide audience is hardly a recent phenomenon, as a teaching and learning resource, videos and multimedia tend to be viewed in a restricted range of contemporary functions such as an affordable, accessible tool for leisure. As an alternative learning medium, videos and shared or downloadable multimedia has found increasing approval among students and the education communities. However, some stakeholders believe its rising advocacy threatens to topple traditional chalk-and-talk instructional methods. Every innovation has its detractors, and not everyone is uncritical. Nevertheless, educational videos have found favour among teachers and students, and the ‘edutainment’ aspect may prove effective in helping the latter understand contexts when learning certain subjects, thus proving that interactive designed media is no longer restricted to providing entertainment. Evidence prove that educational videos assume prime position as a first-choice alternative medium among students from the Gen-Z as well as the Gen-Y cohorts, whose short attention span, pressured study hours and understanding complex textbooks make extended periods of reading and thinking, tedious chores. This paper will debate pertinent theories, arguments and current development in graphic design and motion graphics to review the appeal factors behind instructional videos, the role of designers in the process of video production, and evaluate video’s effectiveness as an educational tool. Collating a fresh set of data from a survey of Malaysian secondary school students, this paper purposes to examine students’ views of and perceptions towards video as a strategy to assist learning, and how its usefulness can be gauged.

Field of Research: Graphics, image, educational video, design, learning

1. Introduction

This paper looks at the use and usefulness of videos as a means to increase student engagement, and the designer’s role in ensuring and sustaining that engagement. With a shift in notions of design as a conversation (Schön, 1987, cited in Kozma, 1994b: 21), aided by the desire of design researchers to substantiate educational technology, graphic designers today are led to ask: What if designers can help make students like studying by changing their perception of the term ‘studying’? If graphical presentations improves our abilities to learn and absorb, why can’t designers help enhance educational delivery and learning outcomes? Have students somehow become too jaded with learning? Although educational content is not customarily linked with motion graphics the way entertainment, video games or advertising is, there have been demands from the stakeholder community to examine and render opportunities for media and design educators to creatively amalgamate the technological, behavioural and arts disciplines for learning purposes (Kozma, 1994a; 1994b). More than merely projecting taste or
expressing style through fancy effects and graphics, videos and multimedia produced for the purpose of
sharing and discussion assist learning, making it fun and interactive while removing barriers.

2. Literature Review

2.1 Graphic Design and Interactive Media Can Do More

Though graphic designers are better associated with producing advertisement, packaging and media, they must
invariably evolve in the age of digital technology. All gadgetries are affirmative of new media and
technology's progress beyond systems and processes; but their true usefulness resides and
corresponds with its enabling abilities. In short, design must be born for the purpose of communication.
The current youth generations, Generation Z, unlike their predecessors are born in an era of advanced
mobility, established by the technologies already existent. Selective attention is given to what they've
been exposed to and are comfortable with most of their lives, i.e. digital technology. Graphic designers,
with a distinctive skillset that “talks” to the young, have a primary role to tie their capacity to learn by
understanding the appeal of graphics, motion, audio and multimedia to sensorial processing.
Approaches that improve social awareness and thirst for knowledge are key opportunities that can be
tapped via screen-based learning, which not only gives visceral realism to static images but has potency
to deliver textual material more effectively, helping engage students in contextual discussions, opening
hitherto limited access to the changing spaces of social interaction. Mediums that bear positive
characteristics to assist learning need to be customisable to attain specific outcomes.

Henry Petroski, celebrated engineer, Duke University professor and author of To Engineer is Human,
believes that all human creations can be used for both good and evil (Heller, 2005). What then do
interactive technologies give to designers? Not merely to create ‘cool’ effects that look nicer and better,
but to search for meaningful ideas that can “fill the huge empty vessels of technology” (Heller, 1998)
and unite audiences through shared spaces. Aaron Marcus, a user-interface designer and artist,
encourages upcoming designers to venture beyond reverence and worship at the altar of beautiful form,
but to seek out the altar of beautiful ideas (Kemeyer, 2004). If we do not ‘imagniate’ the relationship
between media and learning, technology would be relegated for entertainment and leisurely activities
per se, giving hungry industrialists open doors to scurry and design "edutainment" merchandise and
tools which contribute little to educational innovation (Kozma, 1994a, 1994b). The battle for effective
educational solutions does not end just from changing or adjusting the system; they must be carefully
tended as part of the progressive educational development of our society.

In spite of the exciting changes that newer learning technologies such as computers, applications and
telecommunication tools have wrought to generate excitement in classrooms and among academics,
Malaysia’s implementation of technology-based learning systems has not been positively commended.
In fact, certain parties question the need for invested funding into technology and infrastructures;
others are tempted to paint a rosy picture of technology spending as justified on the basis of improved
test scores (Smith, 2001). Unfortunately in Malaysia, news about notable investments to improve the
design and presentation of textual learning materials or educational technology platforms, are patchy.
The Ministry of Education endorses the development of virtual learning environments using wireless 4G
Internet in pilot projects with selected national schools (1bestariNet, 2012; The Star, 2013). Online
coaching is available, but covers a limited scope of subjects. Subscribing to an educational cable TV
channel gives access to a wide range of subjects and is viewable 24 hours daily (Astro Tutor TV, n.d.),
while another option is attending private tuition after school. Still, if access to basic education is vital,
exclusivity hampers the larger vision of transformation that frames the country’s economic development agenda.

2.2 The New Faith in Graphics

In Graphic Design: A Career Guide and Education Directory (American Institute of Graphic Arts, 1993), a well-designed message – in simple printed form or published on media - can enhance the uptake of information processing, as both verbal and non-verbal perceptions are purposefully presented. Graphic design improves cognitive and affective abilities, simplifying or augmenting content with the use of elements like colour, typeface, sizes of text, and imagery. These help audiences navigate at a pace according to the hierarchy and complexity of information. Designers are rightful stakeholders when their involvement takes them into the realm of educational projects. Their task object must always be aligned with the subject matter, purpose and key learning messages aimed to benefit students. Regardless of the method of delivery, schools and institutions should balance conceptual and theoretical ideas with great presentation, and video production is a textual alternative that both appeals and enhances value of the educational experience (American Institute of Graphic Arts, 1993). However, graphic artists’ efforts alone cannot fully capture the gist of the message or ideas.

Donald Norman, author of Emotional Design (2003), says that emotions play a crucial task in assisting people interacts with their surroundings and learn. Emotions are vitally inseparable fragments of human cognition, under which we operate and make judgments. Human acts and thoughts have traces of, and maybe premised on emotion, which also involve subconscious ideation (Norman, 2003). Norman’s “visceral design” concept focuses aesthetic experiences and objects on feelings: we are drawn to sensual appeals, and disinclined for media that repels us. Such thinking may appear to invite designers to jump in and splatter graphics over everything; yet visceral design is complemented by behavioural design, with emphasis on functionality as well. Functional construction entails meaning and reflects the real world needs of users (Schofield, 2004). This shapes up as a virtual holy matrimony, with both constituents meant to be joined, never asunder. The subject (content or performance) is the function; the appearance (form) is how design appeals to audiences. Other ongoing debates focus on the meaningfulness of collaborative communities (Bennett and Polaine, 2007), asking whether design, specifically those that arise from social development contexts, such as creative education, should be greater acknowledged for its role to communicate personal and social responsibilities to designers.

Choi and Johnson (2005) debated in the American Journal of Distance Education about the varying effects of video on learning and motivation, asking whether videos really help students process and integrate information in the cognitive construct, and if benefits gained could influence motivation to study, improve problem-solving and cooperative learning. The contextual basis of video on learning and motivation acknowledges the power of audio and visual information in helping construct “mental representations” of texts. Choi and Johnson (2005) cites the Cognition and Technology Group at Vanderbilt University which developed video-based instructions in 1992 that dynamically moves learners’ mental gears to reason and solve problems through real life scenarios. Audio and visual conjoined becomes complementary, and information is deposited in our storage memory; this was concluded on the basis of a study comparing film reviews written a week after viewing a movie, and audio-only summaries. The immediacy of moving images supplemented by the impact of human voice is powerful, and the simultaneous processing of auditory and visual information aids in learning and remembering (Choi and Johnson, 2005). The results suggest that video-based instruction enhances students’ problem-solving skills considerably if delivery is both active and authentic. Motivation is
another obvious factor that incentivises learning, derived from the ARCS model (Attention, Relevance, Confidence and Satisfaction) as proposed by Keller in 1983 (cited in Choi and Johnson, 2005: 218).

Diagram 1: Dual Code Theory

One theory that corroborates the use of videos is the Dual Code Theory (Diagram 1), in which two separate divisions of human mental codes, the verbal representations and cerebral images would produce two independently operating systems (that also interact) namely, vocal memory and picture memory. Images increase the likelihood of being understood when verbal and pictorial stimulation both coalesce deliberately in our minds, making the memory storage task easier. As these concurrent memories are packaged and stored into each ‘memory storeroom’, the chances of a recalling a past incident or information are greater if it is stored into two locations instead of one (Maniar et al, 2008). A further review of scholarly evidence published from 1985 to 2006 suggest the effectiveness of videos in helping learners visualise the mechanism of an object; improve textual comprehension and articulation; draw attention, spark contemplation and discussion; and provide close-to-real life examples to demonstrate the application of the subject in the real world. Videos have been proposed as an alternative approach suited to students claiming to be image-based learners (Maniar et al, 2008). As it developed, motion graphics had generally been perceived as a forte exclusively handled by experienced designers in television broadcast or film and aptly so, with commercial productions impacting captive global audiences, abetted by easy access and worldwide distribution (Kozma, 1994b: 2). In 2003, Matt Frantz, a Southern California-based artist, predicted that within the span of a decade or so, the majority of graphic designers will be working on time-based media. Existing stereotypical association of graphic design as visuals and words on print, clothing, or billboard ads will stay, but the commonly believed myth that graphic design refers to solely inert images will be done away with (Frantz, 2003). Summarily at this juncture a thesis can be inferred, that well-trained and multi-skilled graphic designers are essential in designing educational videos which aim to pique students’ enjoyment and interest.

2.3 Where Does the Graphic Designer Come In?

Other than creativity, video producers need a foundation in applied designing skills, ranging from graphic to web design, video, photography, animation, and audio production – all of which are interrelated branches of design learning. When working on a television commercial, for instance, the basic principles of advertising, broadcast designs, and skillful talent in blending visuals with appropriate music, are required. From producing animated logos to videos that integrate graphics with animation and audio effects, there is hardly ever a situation where only one solitary skill is needed. Frantz (2003) questioned whether graphic design has grown in tandem with the growth of multimedia, and design education, more than shaping students to go beyond software mastery, must understand how numerous elements of a project coalesce together. Very often, students are easily enthused by fancy Flash websites or arresting videos, not realising that software is only a minuscule part of what they really need to know. He underlines concept development and storyboarding more than software handiness as salient processes. The fields of ever-evolving media technologies require assiduous learning. Designers attend workshops and conferences, immerse in tutorials, and seek advice from user
groups. Artist Robin Roepstorff of Hornet, Inc. concurs with Frantz’ prediction, stating that graphic designers need to adapt visual learning and art direction in controlling time-based media (Frantz, 2003), collaborating with animators, and occupy a larger space that should produce innovations aplenty.

Designers seeking experience in time-based media would do well to study animation. While design education syllabi may already include page layout and typography, animators have key abilities such as frame-by-frame designing and manipulating of shifting shapes. Animators have a head start for careers in motion graphics as they normally build close ties with the entertainment and broadcasting industries compared with graphic designers. Ritchie Sandow, Art Director at Hornet, Inc. advises graphic designers keen on motion graphics to sign up for animation classes: “as traditional as it sounds, classes on 2D animation [would help] get their basics right” (Frantz, 2003). Audio engineering, animation, video editing and computer programming are important tools augmenting modern communication, as such; designers are naturally demanded by clients to produce web interfaces and multimedia. One important breakthrough working with new media is that the course of studying related disciplines leads to stronger critical thinking skills that help in visual problem solving (Frantz, 2003). The question of how long before motion graphics becomes a necessary skill in design education is not as important as knowing how upcoming designers must stay relevant despite breakneck industry changes. The market-ready acceptance of educational videos spawned an array of productions, notably by the Khan Academy.

Founder Salman Khan (2011) and his team created an extensive library of video tutorials for subjects like maths, science, humanities and finance, providing students a 24-hour tutor, practice exercises and assessments online. The Khan Academy’s promised opportunities for more open content access to its tutorial videos in the United States (High, 2013) resulted in greater institutional, investor and government sector confidence, endorsing the founder’s venture. Vital recognition came when Bill Gates called it ‘unbelievable’ (Kaplan, 2010). With its potentially global impact for multilingual users, students are exposed to a non-distracting system of informational processing. To quote Salman Khan, “I hope [the video approach] forms the core of school-based project learning (Reilly, 2012)”. CGP Grey offers a series of informative videos that typify the spectrum of “appeal” factor for video learning, especially in terms of graphics. These productions show the milieu of success attainable for videos and online multimedia as an educational tool. Marketability should be a natural upshot to consider.

Some hypothetical questions are put forward here: How video technologies enhance students’ academic performance and ignite their learning outcomes? Will this learner-centred engagement be for the better or the worse? Finding answers to these would help provide a deeper understanding of the role of design of educational videos as visual agent to increase learner-centred engagement.

3. Research Methodology

To evaluate user perceptions and seek answers about the usability of educational tutorials and videos, an online survey was conducted, targeting secondary students in Malaysia regardless of location who have access to the Internet. This method enables the researcher to analyse students’ enjoyment and awareness of educational videos; and how comparatively stimulating they find them. Problems related to learning absorption and methods to overcome them are pondered on, and the researcher sets out to determine better ways to design learning videos. Other than journal publications, the discussion moves into criticisms and antithetical arguments to facilitate improvement of ideas that enhances the research outcome.

4. Findings and Discussions
4.1 VALS Framework

Kathleen Brandenburg notes that design execution starts by living the design problem (Fast Company, 2004). Understanding the problem clearly begins by getting into the users’ circle, talking to them, and analysing their response patterns. The Values, Attitudes, and Lifestyles (VALS) framework segments the targeted audience according to their attitudes, beliefs, needs, wants and demographics, to enable identification of their vital, characteristic attitudes, traits, psychographic behaviours and preferences. While this technique is mostly related to marketing and advertising sectors, the scenarios produced by the VALS model are broadly applicable to design problems, lending a better sense of audience’s psychological and psychographic attributes and knowing what appeals to the group, how and why.

According to VALS, Generation Z is Inner Directed, living their lives predominantly according to inner values (personal needs and desires). There are three stages of Inner-Directedness. Teenagers belong to the first stage, exhibiting mostly ‘I-Am-Me’ personality traits, signalled by dramatic gestures, impulsivity and passionate beliefs, often excessive to the point of narcissistic tendencies and behaviours that attracts attention towards the self. This segment adopts a system of cognitive, attitudinal and behavioural patterns that many adolescents operate on that bespeaks self-opinion and related self-absorbed behaviours, expressing of inner chaos and emotions that they themselves do not understand. Better defined by their actions than statements, teenagers are willing to try anything at least once (Gilman, 1983), hence, an openness to new experiences in hope that these will keep them in a natural state of vigour and enthusiasm for life.

4.2 Survey Results and Findings

The 150 participants aged 15 to 18 have little interest in present study materials. Tuition classes seem more enjoyable to them given the choice between tuition and staying home, but implies additional time and money on out-of-school coaching, and tuition centres profit by offering succour to those not getting their education requirements met at school. Yet given a choice to attend tuition classes or to stay at home, they choose the latter. While other variables such as transportation, distance, tiredness, etc. are involved, revising in the comfort of home is a convenient alternative to after-school sessions.

A majority are aware of educational materials online, but awareness does not equate usage: only 15 out of 150 utilise them, marking a void ready to be tapped by video-based learning. Social sites Facebook, YouTube and Twitter play important roles in influencing and reaching out to teens. Most are active on Facebook and view it as a vital component of their social lives (Pie Chart 1); YouTube is next, followed by Twitter (Pie Chart 2). With easy access, social media has become a natural extension as a channel for learning. Deep involvement is not the net goal; being active socially, is. Most ruled out Twitter, MySpace, Google+, and other social sites as study sites. At the same time, with content sharing rife among their networks, Generation Z - those born into the culture of open sharing – would not hesitate to start discussion groups on Facebook and ask each other for help in their studies. Twitter is unfeasible for substantial learning with its self-limited concept, although Tweets of video links are popular, and for enhancing language skills like idioms or explaining grammatical errors. Viewing Khan Academy’s video, participants affirmed its usefulness, perceiving its clarity and simplicity; yet, the visuals hardly made an impact nor attracted their attention. The narration was neither thrilling nor bad, and was voted 50-50 overall.
Although the content element is important, not all respondents are thrilled at the thought of studying. Videos that miss the “style” call strengthen their perception towards study boredom. CGP Grey videos, on the other hand, received positive reviews on visual appeal. Its main downside was marred delivery compared with Khan’s, contributed by its fast narration. Students with weak English proficiency found it difficult following the narrator, even though the graphics look better than Khan’s scribbles on the virtual board. In terms of text legibility, CGP fared better than Khan’s. Overall, the Khan Academy beats CGP Grey in terms of precision. Teenagers’ reactions proved the importance of a mix of comprehensibility, visual flair, and message reception in the production of educational videos. From this survey, the researcher infers that many youngsters agree on the use and usefulness of videos for their studies. The surge of interest in mixed media formats for learning may already have started years back, and time has come for designers and animators to ride with the winds of change. Though the jury is still out on choosing between videos and teachers, existing prototypes in the market show a decisive trend. Adults may not necessarily understand this, but teenagers would prefer to engage in creative ways where opportunities exist to mix learning and play at the same place.

4.3 Criticisms

The American Journal of Distance Education (Choi and Johnson, 2005) published a stream of debate among Americans on differing opinions towards video-based learning. One argued that the effectiveness and success of using video technology is dependent on how it is designed and used. A sample of learners chose the television as an easier medium from which to learn, as compared to books, but when assigned to view similar stories from television or in print, greater effort was reportedly spent on learning through reading books than viewing television programmes, implying failure to be instructed if the learner lacks mental engagement with the media, causing the whole experience to be passive.

In sum, learning from videos is effective only if learners are actively listening and processing (Choi and Johnson, 2005). Capturing teenagers’ attention during the first few seconds and stretching their attention span is undoubtedly a critical task. Choi and Johnson (2005) suggested that the type of media used does not have an effect on learning. Instead, learning is shaped by the way media is used. Given that video-based learning does not necessarily enhance learning outcomes, a range of possibilities for designing videos have to be explored. Advancements in programmes, games and applications would enable designers to create outstanding video presentations out of convoluted concepts, for instance, simple animations of science processes have engagement capabilities far greater than conventional class lessons. If the key to success is to aid via meaningful instruction, it would attest to the earlier thesis, in
that well-trained and multi-skilled graphic designers are essential in designing educational materials which aim to pique students’ enjoyment and interest.

### 4.3 Designing Suitable Learning Videos

To counter teenagers’ “tune off” reaction, facelifts in educational videos are necessary. Dale’s Cone of Experience (Diagram 2) predicts that people will learn more from media that gives tangible information, implying that video learning material may be inherently more helpful in some areas (Choi and Johnson, 2005) and less effective elsewhere. So in what context is video considered an effective teaching medium? When it seizes attention, jumpstarts their interest, builds an atmosphere, and mentally anticipates a session of attentive learning, especially for dreary subjects. Inserting a video at the start of lessons is like a brief opening credit (Maniar et al, 2008). The attention span of Gen-Z is shorter than Gen-Y, and Twitter shortened it further. Unless teachers are comedians in the bargain, the prospect of an hour or two of listening to lectures is akin to watching a hamster run on its wheel. Associate Professor Rhett Allain (2011) at Southeastern Louisiana University’s Department of Chemistry and Physics compared the length of YouTube videos and their viewership, and found that videos with the highest number of views were those less than two minutes; the highest concentration of viewers is for videos of not more than ten minutes (Diagram 3). Besides, the interactive method employed would keep students communicating with each other, and this inadvertently increases the teachers’ teaching efficiency and enjoyment. If the strengths of Khan and CGP Grey were married, the concept of creative, snappy video tutorials combined with eye candy graphics, will be a respectable thrill for any learner.

### 5. Conclusion

The emergence of new media, enjoining different types of audio, visual and information technologies, is here to stay. Videos that captivate and plant active listening habits support constructivists’ arguments that learners should be involved in deliberate, bona fide, and cooperative learning for the whole process to be successful (Choi and Johnson, 2005). From this new mental construct towards learning (i.e. work and play in the same space), any learning opportunity becomes important, and emotional design is an important dimension of the relationship between what students want to understand, from whom, and where. In seeking the potentiating effects of educational video in a Malaysian context, this research collated data from a survey of 150 Malaysian students, to study their views of, and perceptions towards video as a strategy to assist learning, and how its usefulness can be gauged. The relevance of video as a
learning method for screen-preoccupied contemporaries (Generation Z) is discussed. In the final analysis, the researcher had found concrete examples of the use and usefulness of educational videos as a learning tool that improves clarity and depth of subject knowledge, while satisfying students’ eagerness for stimulating new media forms. Although the merging of education and media in Malaysia has not gone beyond developmental stages, proactive efforts must be made to take advantage of this period to prototype. The process would not be as tedious if stakeholder involvement was broadened, from curriculum and software developers to school boards, educators, parents, media and authorities. In this, designers have a bigger role than they realise. A legion of committed design educators who view their responsibilities as a cohesive show and not a one-man task can begin to find ways to collaborate, utilising each other’s proficiencies to reach the coveted goal. If video-based learning enhances how students perceive learning and assures attentiveness, a big part of the battle has already been won.

References


Diagrams
Diagram 1

Diagram 2

Diagram 3