

# QuickTime multi-track theatrics

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**Abstract** Digital media, corporate database applications and intranets provide efficient ways to create, store and deliver information and educational services. However some academics perceive new workload and other constraints eroding the potency of these technologies. Proposed corporate level information management systems for digital objects and their metadata are new complexities entering academics' thoughts about using online multimedia.

Few staff understand digital multimedia concepts and fewer still, the systems designed to deal with IP management, copyright law compliance and the tracking of digital resource creation processes. Faltering staff enthusiasm warns of their need to experience working models and tangible benefits from these new directions. A project in Deakin's Faculty of Education provides a case study showing how QuickTime is helping academics understand, and increase their use of, multimedia in e-learning environments with an integrated library of digital resources with metadata.

We also report our experience of QuickTime in creating interactive learning objects using multi-tracks. We discuss our idea of *theatrics* as a performance drawcard — people *will come!* There is orchestration of multimedia and QuickTime conducts the events, its flexible functionalities providing a safer development environment for solving problems and grasping opportunities.

While difficult for some academics to comprehend, scripting automation and database connectivity through intelligent interfaces might facilitate QuickTime's use in building integrated learning environments with academics. These ideas are considered in relation to staff development, central to the case study project.

**Keywords** QuickTime, multimedia, multi-tracks, e-learning, digital objects, Academic Professional Development (APD), Instructional Management System (IMS), online learning and teaching, interaction, transforming teaching.

## Introduction

'If you build it they will come.' This quote from the film *Field of Dreams* is used by Adobe ® in a 2001 flier for software upgrades. The quote expresses the hopes and fears of many software developers. Will the projected market eventuate? Will the buyers/users come? In referring to the film with the benefit of hindsight we know they (the baseball players) did come! In this paper we highlight the same concern for educational technology

adoption in higher education, citing a case study of Education Studies Online (ESO). Here we identify some of the technology *monsters* that staff development must deal with if average teaching staff, as mainstream ‘settlers’ of new technology domains, are to join the adventurous, early ‘pioneers’. We advocate *project-based learning experiences* for teaching staff and report on QuickTime’s role in assisting staff to understand many of the new concepts involved in multimedia learning resources (digital objects). We also illustrate how ESO and QuickTime helped staff to comprehend the significance of using digital libraries in hypermedia learning environments such as provided by Course Management Systems (CMS).

While an original purpose of Deakin’s Comprehensive Online Research and Development (CORD) project and the resultant ESO environment was professional development in e-teaching, what ensued will be familiar to many developers and early pioneers in the use of information and computer technologies (ICTs) in Education. The small group of teaching staff from whom the project originated, were some way ahead of the majority of staff in regard to their conceptions and use of computer technologies, resource-based teaching and learning and more particularly in this case, web-based learning environments created with database back-ends with an integrated repository for digital resources and dedicated single purpose conferencing.

There has been varied acceptance of the many functions in ESO, but we are able to report QuickTime’s strong contribution to helping academic staff better understand new concepts in hypermedia resources used in e-learning environments supported by Digital Object Management Systems (DOMS). We also report briefly on our new applications for QuickTime multi-tracks in current and future projects in Deakin. However our goal is captured in the paper’s title — referring to multi-track *theatrics* as a winner for staff development. QuickTime technology is a facilitator and motivator — a drawcard in the tradition of theatre — the people **will come** to see it.

### **Digital Object Management Systems and the tertiary teacher**

Like many universities, Deakin is exploring options for installing a corporate level Digital Object Management System (DOMS) to facilitate the acquisition, creation and management of wide ranging digital objects for the university. Such a system must interface with other networked systems contributing to the creation of both physical and virtual teaching and learning environments which, among other services, deliver secure resources to teachers and students in multiple locations.

Deakin is actively developing policies, strategies, organisational structures and new staffing arrangements (The Deakin Advantage, 2000) for designing and creating the online courses delivered to students via an Instructional Management System (IMS) or more accurately, a Course Management System (CMS) such as TopClass, the one presently in use though not widely accepted. Traditional forms of library metadata about selected educational resources are presently held in a Lotus database in compliance with copyright and other such intellectual property matters. New approaches to metadata creation and management are being actively explored in alignment with developing international standards. However, a DOMS is the next *monster* (Segrave & Warren, 2001) we expect to confront tertiary teachers trying to come to terms with newly defined learning and teaching environments in higher education.

Teachers are now being told that a DOMS will be able to manage digital objects in all media categories and ranges from the *atomic* level, such as a single still image jpeg file, to

a highly aggregated package level, such as might comprise a streamed multimedia QuickTime based program calling on elements in the DOMS database.

Academic staff with responsibilities for staff, student and course administration have recently confronted new products in the macro cluster of corporate-level Oracle-based information management systems: for students (Callista), for staff (Concept), for finance (DFMS) and for courses (TopClass and FirstClass). Staff are now facing the prospect of at least some engagement with a DOMS and its related metadata system, hoping they match user interface qualities of the best of the existing library database systems.

A DOMS requires a metadata system working closely with access control and search systems providing authenticated access to both internal and external resources by Deakin staff and students. Each digital object in such a system has a unique metadata file profiling its content attributes, technical specifications, creation workflows, version history and descriptions of relations (such as parent and child) with other objects. This data enables perhaps timed release after IP clearance, currency monitoring, tracking and other controls, and of course searching for immediate use and in some cases for e-commerce.

As teaching staff are most often the initiators of resource acquisition or creation (this may be changing) and determine the purposes of resources in courses, they must be involved in elements of resource installation, particularly in specifying certain metadata. Hence, teaching staff need to embrace this new networked environment of knowledge, information and data if they are to influence and derive benefits. Naturally however, ‘a chasm confronts mainstream settlers who follow the pioneers of e-learning environments’, as followers consider the prospect of transforming their professional identities and practice as teachers. (Segrave & Warren, 2001). An IMS focus highlights authority, administration, efficiency, and IT concepts from the information sciences. Academic teachers can feel distracted, threatened and fearful of the knowns and unknowns. While APD is usually viewed as a bridge to improved human performance, traditional training workshops often fail. APD effort requires an appropriate vehicle. ‘From the outset Education Studies Online was developed as a *vehicle* for APD, grounded in the reflective practice of renewing the profession of academic tertiary teaching.’ (Segrave & Warren, 2001).

## **Our interest in digital objects**

Interest in digital objects, containers, content packaging and interoperability was initiated by a workshop conducted by the Global IMS consortium at Melbourne University in 1999. This significantly motivated a project proposal to investigate the kinds and functionalities of interactive learning digital objects, and the associated software, skills, processes and costs to produce them or source externally.

The goal of our centrally funded project of investigation was to ‘provide contemporary data and analysis that enables the University to invest strategically in making learning and teaching resources available online, whether it be the conversion of existing items or the creation of new items. Items may include online learning environments, new media objects and the component elements of these, with *priority* being given to multimedia types of “containers” or solutions for delivery online.’ (Segrave, S. et al., 2000)

The first two objectives of the project were:

- ‘Identify then describe a targeted set of new media and online educational approaches (technology-based “model / generic” solutions).

- Produce a descriptive profile of types/levels of new media learning objects in terms of their size, functionality, modularity, reusability, other attributes and costs.’

(Segrave, S. et al., 2000)

Since then, QuickTime has been a significant platform of choice, running alongside developments using other proprietary authoring environments.

## Education Studies Online (ESO) — a case study

In December 2000, ESO was awarded the Vice-chancellor’s Award for Outstanding Achievement — Outstanding Teaching (including curriculum/materials development).



Figure 1: ESO, Module 3, Part 1.

ESO is Deakin’s first working example of a comprehensive and fully integrated and extensible e-learning *environment* (Fig. 1.). It was then an exemplar of the forecast university-wide learning systems, a suite of technologies scaled to meet the specific needs of a Major program in a Faculty. The Education Studies Major (ESM) is the only *major* program in the Faculty of Education and all undergraduate students must complete it. There are approximately 1700 students enrolled and 26 full-time and 10 sessional staff teaching in the Major across two campuses.

Initiated in 1998, under the auspice of Deakin’s Comprehensive Online Research and Development (CORD) funding, ESO developed as an IT-based, R&D project expected to impact on the strategic directions of the ESM, its curriculum and resources, its staff and students. As a serious purpose of the project was academic staff development, additional impacts on faculty staff capabilities and work practices were expected. Tangible outcomes for the wider University can be seen and its change agency continues to unfold.

The ESO initiative is comparable to those in business and industry where considerable management effort and resources are expended to facilitate the necessary transformations in capabilities and work practices of staff. ESO integrates elements such as: unit content in flexible modules, a digital resources library with associated catalogue and metadata, streamed video and audio, multimedia learning objects, group and individual work areas

(such as private journal and professional portfolio), comprehensive search functions, and seamless articulation with FirstClass conferencing.

The ESO project proved to have been predictive of wider and fundamental University trends to imbue academic programs for the professions with quality IT based e-learning. This is now mandated in Deakin through its Teaching and Learning Management Plan. It is evidenced by the introduction of corporate IMS solutions and related e-learning environment proposals such as those for a DOMS and what is presently known generically as the 'Online Campus'. Staff involved in the ESO project received early and valuable experiences in these matters and have created a useful exemplar for Deakin.

In an evaluation of ESO (March 2001) Rice, reported:

*Digital resources library:* The database delivers discrete learning resources that can be used for different purposes throughout the site. They can be integrated into a module or activity by being assigned to those, or the database can assign resources to one or more topics in any modules. At present, there are 213 of these discrete learning objects in the digital resources library with associated catalogue and metadata. They include photographs, streamed audio and video excerpts, multimedia learning objects, and text documents. (Appendix 3 of the report details the streamed QuickTime media.) (p. 6)

ESO challenges existing assumptions about the type of content presented to students and the opportunities made available for participation and interaction. ESO asks academics to construct environments that invite students into the space to participate in the content creation process. (p. 21)

The need to provide metadata (catalogue entries) for resources placed in the repository will be a challenge for staff, particularly if they do not have the time or interest to work with the site in that way. In addition to providing information about the author, title, date, key words have to be selected and a description of the resource from a technical point of view is required. The idea of using a search engine to find relevant resources in the database will also be a challenge for users. (p. 23)

The CORD project created this networked teaching and learning environment (Segrave & Holt, 1999) for all participants of the Education Studies Major at Deakin University, we can now say "We have built it — did they come?"

Did the teachers and students participate? Yes, in line with the 'Field of Dreams' and as asserted more recently by Adobe (2001), 'If you build it they will come'. But it was the digital resources library with the integrated metadata that captured their imagination. More than this, it was the http and streamed QuickTime multi-track resources that were constantly asked for and demonstrated. More recently, however, new copyright legislation has added complexity to the delivery of some resources, but QuickTime has assisted again in meeting needs.

## **Trends troubling teachers**

The IT revolution largely concerns data and information, that is, "content". Its management involves structuring, storage, retrieval, and of course the timely, easy and authorised communication of the protected information. Information management and communication is largely about connecting digital devices and moving content between them for people to use. Society is very clever at this technology and most commercial organisations and even social institutions and professions have realised benefits from its

use. Sadly, for educational purposes, IT has been misconstrued as an instant, ready made teaching and learning technology.

Some university administrators seem not to recognise the differences between communicating 'content' and facilitating learning. We are continuing to be caught up in 'library science' in the forms of 'content repositories', 'content shells', 'learning objects', 'content packaging and interoperability' and 'metadata'. We are also caught up in educational administrative 'efficiency' agendas (which legitimately aim to use the new digital information management technologies), but under the umbrella of terms such as instructional management systems (IMS), there is much confusion by non-educators (and quite probably now among recent inductees into the university teaching profession, about exactly what e-learning and teaching 'look like'.

Deakin has tried to embed professional development in centrally funded projects aimed at renewing curricula and their assisted implementation through technology. The related goals are to improve teaching and create innovative educational resources. But some staff are not genuinely transforming their teaching practices. While appearing to participate in new e-learning projects, some staff make token inputs creating online resources that add little value.

Given new learning technologies, new theories of learning and teaching, and life-long learning, all teachers face ongoing role transformations. The *tools and artefacts of culture* which impact on information processing and communication (Salomon G. ed. 1993), are seriously challenging our understanding or what it means to teach and learn. Considerable effort and money have been expended by organisations in general to facilitate the necessary transformations in employee capabilities, but how are universities facilitating transformations of teacher praxis? We advocate *project-based learning experiences* for teaching staff and projects using QuickTime have much to offer changing teachers' understandings of online multimedia.

### **QuickTime elements of ESO project as staff development**

During stage one the ESO project in 1999, teaching staff (and support staff in Learning services) frequently asked about the size and length of video and audio resources that could reasonably be placed on a website. Their concepts of online media were naïve, but the technical solutions and advice from support staff were also scarce. There were few examples to show staff.

As part of the ESO project management website, a demonstration page with AV clips of varying and scaled specifications was prepared and the limitations of serving via http were apparent. Interest from teaching staff continued however and a small NT server was commissioned as a pilot.

Pressure to deliver AV online to students involved use of existing media resources for teaching on-campus that required attention to copyright. As ESO was evolving a metadata catalogue for the resources in its digital library, attention was paid to assisting with copyright compliance and also providing students with information about resources they might consider downloading, particularly over a modem.

An early decision was taken by the Education Designer to extract the staff development benefits from integrating the QuickTime streaming server with the following ESO elements:

- Learning activities in the ESO ASP pages

- Resources database
- Resources catalogue
- Search engine

Staff and students could then experience a scaled down but fully integrated environment that gave them control over AV resources: uploading; allocating exclusively to modules in the course; linking to WebPages such as unique activities; smart searching; and media asset management in the repository.

Our emphasis on QuickTime is because it is a flexible platform, and exposure to it transforms the *traditional* media concepts of users. It has been particularly good for demonstrating to academic staff (unskilled in multimedia concepts and production) a wide range of what are now frequently called digital *objects* that can be re-purposed and used in multiple programming locations and perhaps in larger media entities. Our focus was on providing examples that improved staff's conceptions of digital e-learning objects in a database driven site rather than solving Deakin's main-streaming of online AV media for e-teaching.

Our recent experience of university-wide discussion has been that there is real uncertainty about digital libraries, metadata databases, IP management during development, production and e-commerce situations. QuickTime has helped demonstrate to as yet a small audience in the university, the provision of copyright compliance and some storage of metadata. But as Fraser rightly and simply states:

‘It really comes down to education. The more you educate your friends, co-workers and clients about what is possible, versus what is the current standard, the more possibility there is that our future just might live up to all the hype.’ (Fraser, 2001)

QuickTime has been a strategic tool for Deakin.

## **Our QuickTime experiences in the ESO project**

The use of QuickTime in the ESO project may be considered in three levels of awareness and a fourth level represents our current thinking about future directions:

<b>Awareness Levels</b>	Description
<b>1</b>	Optimising movie files for http and rtsp serving, including the use of chapter track index points.
<b>2</b>	Creating a packaged digital object with tracks navigation and metadata to represent digital library concepts.
<b>3</b>	SMIL was used to orchestrate assemblage of three separate movies into one movie, automating the insertion of IP data into a movie to meet copyright compliance for streamed movies.
<b>4</b>	QuickTime 5 opens new possibilities because of the new XML-parsing feature, which creates the ability to deliver multi-track resource management from a database.

### **Awareness Level 1.**

Optimising movie files for http and rtsp serving, including the use of chapter track index points.
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In ESO during the first year nearly 150 unique AV files were delivered using QuickTime, with approximately 80 delivered by the Darwin streaming server. For every streamed movie, regardless of its nature, T1, 56k and 28.8k data versions were mounted on the streaming server. A reference movie was created and uploaded to the ESO digital media repository as the final step in the process of completing the metadata catalogue entries for the movie.

The first snatch of material requested or suggested is fairly represented by the following categories:

1. Deakin 'legacy' video and audio productions already used by teachers on-campus;
2. New Deakin productions commissioned but not intended exclusively for online delivery;
3. New Deakin productions commissioned exclusively for online;
4. Productions recorded from public transmissions under Screenrights copyright provisions.

To achieve a rapid response to staff requests, 'quickie' treatments and trial processes were conducted on a 180mhz 8500AV using QuickTime 3.0, VideoShop 3.0 and Media Cleaner Pro, with video and audio inputs from analogue decks. The movie processing specifications were roughly optimised to match the education purposes and the nature and technical quality of the content. The aim was to get the stuff online for staff and students and seek their comments.

The following strategies provide a sense of our approach:

- Audio-only movies were stripped from video programs with low image value;
- A still image would be used to provide context;
- 28.8k versions were selectively reduced to slide-show rates of 0.1 fps;
- High value excerpts were cut from long video material;
- Image sizes were rationalised;
- Colour was removed to provide more headroom for better frame rates or higher quality sound;
- Image sizes were explored for handling subtitles for foreign language material;
- Chapter tracks were provided on T1 versions to improve student access and use on-campus.

Our approach was to explore it in a rough way while directing the more important productions to staff in Deakin's central video & audio services (the Interactive Media Group of Learning Environments). They concentrated on refining process specifications, achieving high quality raw material, and higher quality outputs from smaller file sizes. These were usually for longer movies delivered via QuickTime streaming and CD. The Interactive Media Group have recently renewed their major Apple hardware and software production suites.

We are still facing the challenge of enabling teaching staff to create, upload and link their own AV resources to the streaming server and a learning environment system like ESO. The Education Faculty has recently commissioned two development labs for staff-only use.

## Awareness Level 2.

Creating a packaged digital object with tracks, navigation and metadata to represent digital library concepts.

Once the idea of a digital library was introduced to staff, we set about communicating the idea of a digital learning object. With poor access to tools such as Flash for producing multi-component, interactive objects, we worked again with QuickTime and created 50 multimedia resources for placement in the ESO SQL database with the ASP-based learning management system behind ESO.

These digital objects *contained* up to 15 related images with text tracks for academic comments and metadata. These objects were based on a single container model (Fig.2) that we filled rapidly. They had the following characteristics:

- linear navigation through a sequence of frames in the object at reduced size;
- image size toggling between the reduced size for easy display (then rapid sequencing) and the actual size;
- image surface area navigation on actual size;
- a separate image-track display as a pop-up (eg a teacher's remark on work displayed);
- a commentary text-track display as a pop-up (eg lecturer's comments);
- a metadata text-track display as a popup (eg IP data).

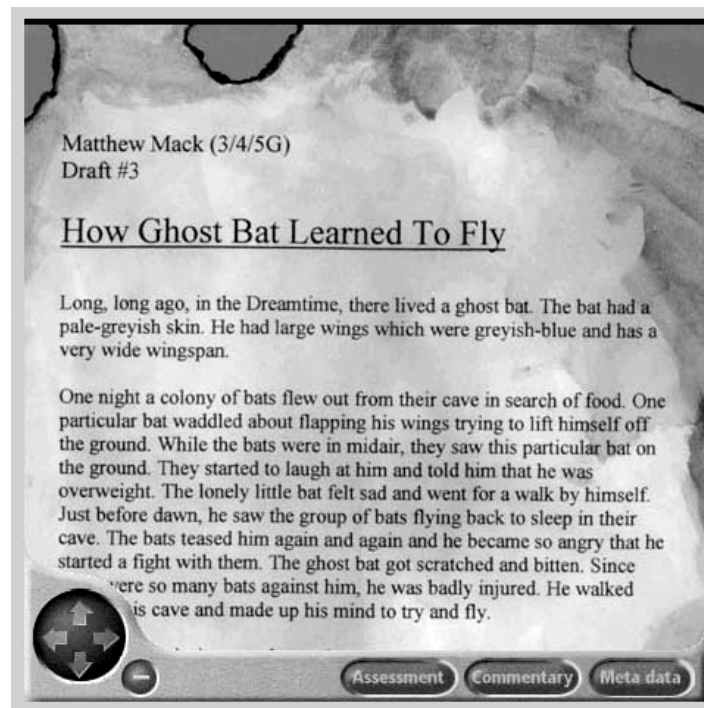


Figure 2: Primary student's work as a navigable object in the database.

These packaged resources were created using wired sprite movies and played as QuickTime files downloaded from the http server. They are a simple exploration of the following concepts:

- Discrete learning objects of the kind expected to be loaded into a resources database;

- Learning resources created as objects installed in a repository at the same time their metadata is installed in a related database;
- Learning resources containing their own metadata (though not aiming for compliance with IMS standards implemented in XML.)

Waterworth, et. al. (2000) provides examples of these resources including one type presenting historical primary source materials in a way that enhances students' interaction with its elements. Students are able to interpret material and add their reflective writing in their private journal, portfolio or perhaps an associated web page in ESO or their two Deakin web home directories. Students also contribute threaded comments to ESO for others to share and a dynamic repository of such contributions are linked to unique individual learning activities where students' contributions become integrated with activities and their incorporated QuickTime resources.

### **Awareness Level 3.**

SMIL was used to orchestrate assemblage of three separate movies into one movie, automating the insertion of IP data into a movie to meet copyright compliance for streamed movies.

The flexibility of QuickTime was appreciated when changes to Commonwealth Copyright Law in Australia impacted on the method of legal delivery to students of video and audio recorded by the university under the Screenrights provisions (Deakin University Copyright Guidelines 2001.).

In this instance SMIL has been employed to orchestrate the playing of text movies of copyright information up front of the movie intended for use by students.

The method presents data on the 7up-jackie.smil movie such as:

SEGMENT: jackie segment

CHANNEL: SBS

DATE: 12/3/91

TIME: 8:30 pm

DURATION: 23 mins

PROCESSED BY: This copy produced by Learning Services for Deakin University.

This information is followed in the same way by a standard re-used Commonwealth of Australia copyright warning. (Fig. 3.)

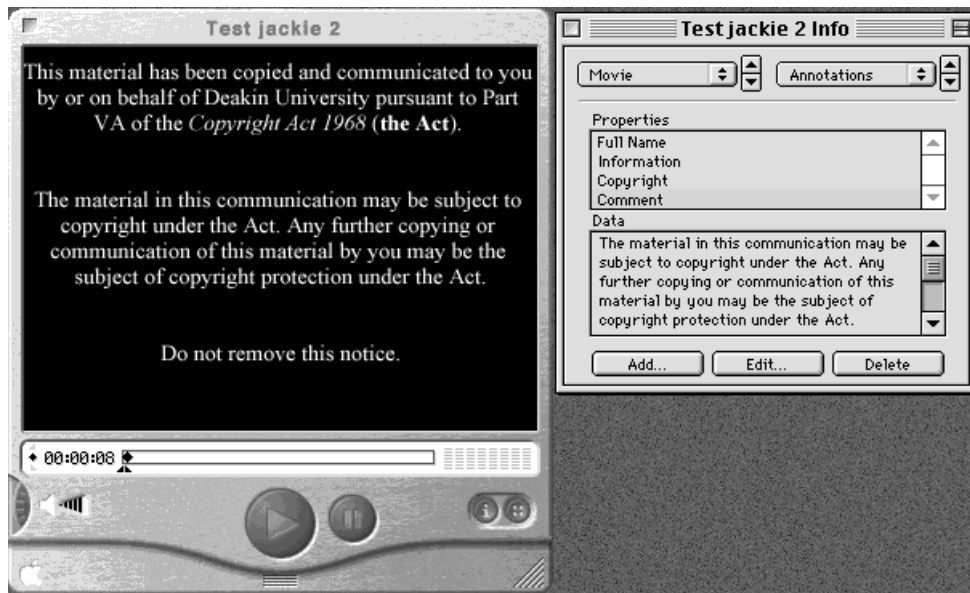


Figure 3: Primary student's work as a navigable object in the database.

Textual data is also contained in the SQL database and ESO users can preview the data on movie resources before choosing to view by streaming.

#### Awareness Level 4.

QuickTime 5 opens new possibilities because of the new XML-parsing feature, which creates the ability to deliver multi-track resource management from a database.

A new era of multimedia creation is emerging, summoned by those seeking even simpler interface tools to control certain aspects of the multi-media creation process.

QuickTime movies in their simplest form are time based layers of tracks and objects which have a defined set of properties such as height, width, start-time, end-time, layer etc. an object in QuickTime can have up to 50 different properties. Added to this complexity is the ability to have movies within movies (MIAM). Each of those movies can have its own set of properties. Theoretically there is no limit to depth of how many movies within movies there can be. Realistically this is not quite true.

If we wish to rapidly build movies from a variety of components such as different video tracks, audio tracks, images and even other movies which may contain their own interactions then it would be faster and more powerful to be able to build these movies from an external source which describes to the QuickTime movie (or movie builder) the parameters of how large, where and when an object should play.

XML means that extremely complex movie can be built from a simple text file or a series of text files in a very dynamic manner. Further to this the XML file can be built using the aid of a database, the database can then have an interface that content creators can use. While all or most of the components of the movie must exist in some form the way the tracks are assemble using this method can be endless.

An alternative method for building dynamic movies is to use the new QtList feature of QuickTime. In this case data can be transferred between a database and a movie directly in the form of a URL link. This is especially useful in the case of text that may be contained in the movie. No longer does the text have to be a static object in the movie. It can change depending on user interaction or a number of other parameters.

Dynamic movies are just about the best *trick* going and QuickTime delivers an incredible range of possibilities where others are still only seeing the possibilities of combining a image track with a video track from a locally produced file. With QuickTime's large list of different track types such as QuickTime, instrument tracks, tween track, modifier tracks, Flash® and even Movie tracks the possible outcomes, when you consider that they can be build on the fly from data described by a database, means that anybody can perform the *trick* and not just the technical Magicians.

Andrewartha & Wilmot, (2001) observed that:

‘The design of a front-end program to automate the process of incorporating the content into the template would be beneficial. Designing an ‘automatic builder’ would mean that the lecturer would simply pour content into the relevant proforma box and then allow the utility program to build the sections. Much less knowledge of Macromedia Director software would then be necessary. (p. 17)

By using QuickTime, the degree of expertise required to conduct a performance from multiple elements has been made as accessible as street theatre with lots of participants — and yes — when you build the show with multi-track *theatrics*, the audience will come!

## QuickTime in Summary

QuickTime is helping to increase use of certain educational online media, both pre-packaged media objects uploaded to a digital library and the more individual and ephemeral resources and presentations by teachers via http and streaming.

The ESO project in the Faculty of Education provided the initial impetus for wider use of QuickTime and the initial use of a streaming server. The ESO case study shows how QuickTime is helping academics understand the concepts involved in e-learning environments using integrated digital libraries and metadata. It is helping to dispel fears associated with complex environments with multiple database back-ends.

Our paper briefly deals with corporate information management imperatives such as:

- Managing intellectual property information and facilitating metadata within QuickTime media objects in the period leading up to properly integrated “Content Repositories” / Media Asset management solutions for the university; and
- Assisting in collecting and retaining copyright information within QuickTime Learning Objects and in association with the website's resources database;

it also explores how QuickTime assists university education imperatives such as:

- Student control of streamed movies using chapter tracks;
- Image and text based learning objects in QuickTime;
- Interactive movie building using multi-tracks and databases.

While many end users and some developers don't properly appreciate it, QuickTime provides a suite of inbuilt functionalities solving potential problems and grasping opportunities in the dynamic age of digital learning object management systems and QuickTime's flexibility provides a safer development environment.

While QuickTime's multimedia flexibility is difficult for some academics to comprehend, new approaches to automating movie assemblage through database connectivity through intelligent web-based interfaces might facilitate its use by academics.

## Conclusion

A persistent challenge in the ESO development is the transformation of conceptions of teaching enacted in learning environments either wholly or partly online. While the published rhetoric of academic staff might be about new teaching and learning opportunities online, some academic staff view as a problem, the prospect of transforming their professional practice. Environments and interactions for learning online do not replicate what some teaching staff are familiar and comfortable with either in the classroom, laboratory, lecture theatre, or through traditional media such as audio and video tape, telephone and print.

The ESO project group were given the brief to facilitate engagement, participation and interaction by students in an innovative e-learning environment to be built. Would the students come? The greater challenge however proved to be the ongoing nurturing of academic professional development to ensure the teachers came.

What does e-teaching look like? What kinds of experiences motivate teaching staff to change the way they make learning happen? Our experience has been that staff are not really confident about changing what they do face-to-face or in print, to another way of *being a teacher* online, particularly when they believe that they are already *being* a good teacher. They are unsure of how to motivate, engage, participate and interact online. They know these are critical practices, but they don't know how to practice them online.

Teaching staff in the Faculty of Education have been long time users of video and audio in the simple sense. They have used cassette tape programs in their lectures and tutes, and at Deakin University there is a long tradition of such AV use for distance students. QuickTime is a logical progression. We have used QuickTime not only to solve media construction and delivery challenges, we have used it to command performances that draw in the audiences.

If you build it in QuickTime — they will come.

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