

# **A model for the design of a new-skills-strategy for the Creative Industries sector.**

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## **Abstract**

The fast pace of change within the animation, computer game and post production industries has presented a problem for Vocational Education and Training (VET) programme developers who are finding it increasingly difficult to stay relevant and up-to-date with the latest employability skill-sets in this industry sector. A comprehensive study of the Australian digital media industry - including the latest systems, software, technologies and production pipelines - is not readily available, making it difficult for Training Package developers to create up-to-date, flexible, meaningful and transferable qualifications.

In response to this problem, research was undertaken to identify the needs and realities of work required for the production of digital content within the Australasian digital media and post-production industry sectors. Employability skill-sets and attributes have been recognized and categorized through a skills audit (quantitative data) of position descriptions and role statements advertised over a six year period. Progressive levels of skill, knowledge, problem solving and attitude have been applied to the researcher's own studio production through an Action Research process.

This paper documents the research and reports on findings identified through industry position descriptors making recommendations to support the integration of the new digital animation skills through a framework of progressive qualifications.

## **Introduction**

To begin to address the problem faced by Vocational Education and Training (VET) programme developers in ensuring that curriculum is relevant and up-to-date with the latest employability skill-sets in the animation, computer game and post production industries, it was necessary to devise a study that was fully informed by the workplace demands in these industries. An important focus was that of the new skills required for computer-generated 3-D content.

The study was undertaken with the support of, and within the context of an Australia Research Council Industry Linkage grant to create a model of knowledge transfer relating traditional animation skills to automated software programs. The national significance of this project is its contribution to the sustainability of a commercially competitive animation hub in Australia, if not SE Queensland. My contribution to the overall project involved scoping, modeling, development of research instruments, data gathering, analysis and interpretation. This was based on a quantitative data survey from industry complemented by a studio-based enquiry.

Two key imperatives provided the impetus for the study. Firstly, the numbers of jobs within the digital sector have proliferated both globally and within Australia, with

numerous reports calling for training programs to service industry needs in the wake of a shift in animation production strategy. For example, the National Training Quality Committee sought, and gained, the support of State Ministers, to conduct a review of the 2001 (CUF01) Film Television Radio and Multimedia National Training Package, a nationally accredited training framework for the Media Vocational sector 2004-6. Secondly, there has been an increased use by industry of computer generated animation since 1996 and as predicted by internationally respected animator (Servais, 1996) the number of filmmakers employing computer animation has risen, threatening the livelihoods of animators relying on the demand for time-intensive skills such as inking, colouring, and in-betweening.

The issues for the training sector underpinning these imperatives are complex, calling for an inquiry to identify what, where and how new learning and professional development needs can be supported to ensure the economic survival of the industry. The data collected from a substantial ongoing review of skills-shortages and workplace requirements that were routinely available through job postings in the related industry sector allowed an overall picture of industry needs to emerge - an objective foundation for the development of a training framework.

The study sought to utilise a combination of research and studio-based inquiry to identify needs and arrive at recommendations to guide Vocational Education and Training (VET) for the Digital (Information) Content/post-production industry sector in Australia. It sought to do this by classifying skill-sets and attributes required for the development of a training framework for the effective employment and integration of individuals into working environments with a focus on 3D computer animation.

### **Context of the problem**

Recent studies completed by the Centre for International Economics (March 2005) as part of the Digital Content Industry Action Agenda (DCITA(1)2005:P5) have found that:

- the total value of the Australian digital content industry today is estimated at just under \$20 billion (about 3.3% of GDP);
- approximately 300,000 people are estimated to be employed in the digital content industries and the area is estimated to run an annual trade deficit of about Aus \$2 billion.

These statistics highlight the size of the digital content industry and have consequently fostered higher levels of government interest and research in the area. Key recommendations from (DCITA(2)2005:13) stress the need to increase investment, exports, skills and training, and research and development in the Digital Content Industry. The significance of education and training in this rapidly growing industry sector is witnessed by both the emergence of a *National Training Package* (ANTA 2001) and the plethora of government sponsored reports supporting an increase in funds for the development of the 'Creative Industries' (DCMS 2002).

Apart from market information published by the AFC on film, TV, games and multimedia, there is little industry, employment and skills information available. There is no regular industry information on emerging occupations and future skill needs. (DCITA(2)2005:64). It is recommended that a National skills audit is completed to gauge and identify needs across the industry. This research project

responds to this issue focusing on the data gathering and collation of knowledge and skills required by the industry sector through descriptors in job role requirements - a new skills formation strategy based on factual information to advance Vocational Education and Training.

## **Research Method**

The field of inquiry is interdisciplinary, encompassing an investigation of labour market trends, animation practices, and education and training for a technology-intensive creative industry. The nature of interdisciplinary work is that it “integrates knowledge and modes of thinking from two or more disciplines”, and “embraces the goal of advancing understanding (e.g., explain phenomena, craft solutions, raise new questions) in ways that would have not been possible through single disciplinary means” (Mansilla and Gardiner 2004:2).

The model developed for this research is based on Participatory Action Research (PAR) an emergent and generic paradigm. The PAR process has been described as a “collective, self reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own social...practices” (Kemmis and McTaggart 1988:5). However, where the intention of PAR may be to create a positive social transformation, this research seeks to develop a vocational training framework which is based on occupational/industry indicators categorised from labour market analysis and cross referenced with developments in the research practitioner’s own studio production and growth. In order to facilitate this line of enquiry and production, three projects were undertaken: two with clients (social situations) and one personal. Progressive skill development and the transfer of knowledge were critical to the project development over the phases of the study.

A continual cycle of experience-reflect-plan-gather-analyse-categorise-act-develop-produce-distribute has been utilised. Information was gathered from surveys of industry practitioners, interviews, observation of animators in industry, documentation of the cognitive structures and processes involved in client centered work, DVDs, literature on computer animation and animation conferences in Australia (Hooks 03, AEAF 04), UK (Animex 04) and USA (Siggraph 05). The primary data for this project have been collected from digital imaging jobs advertised in Australia 2001-2006. Job postings have been gathered as categorical (or nominal) data and grouped in relation to similarities of knowledge and skills requirements. Web sites have been analyzed and annotated with a view to finding information that relates to animation curriculum and motion curves, these two areas were identified as areas that required further investigation based on preliminary research findings. Domain specific skill-sets have been integrated and utilised in practitioner activity. Processes were documented and selected skills and knowledge were transferred into the next cycle. Awareness, skills and knowledge increased progressively with each cycle.

Animation production requires knowledge and skills in more than one discipline as does the development of a training framework based on current work-place skills requirements. The interdisciplinary nature of this study has led to the development of a hybrid research methodology which utilizes a combination of research and studio-based inquiry in cycles. This process has been developed to address the issue of

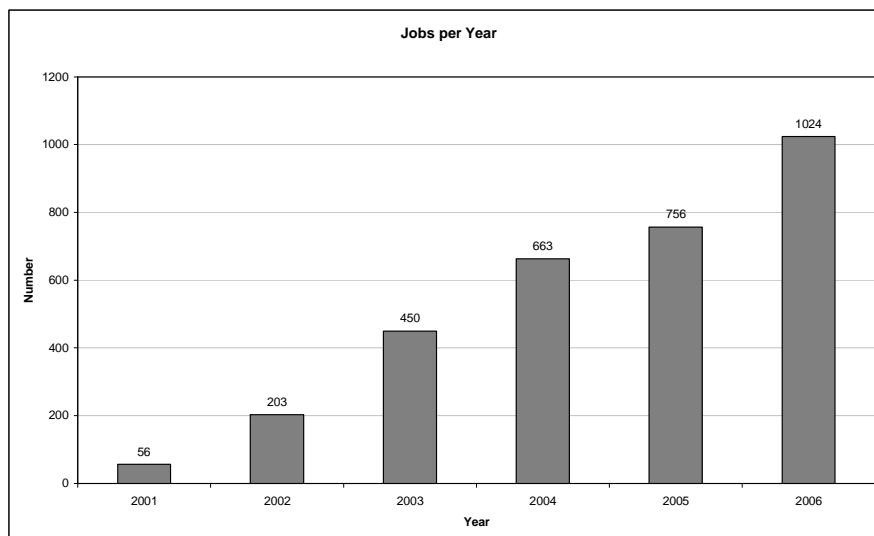
progressive skill development which has been based on varying levels of complexity evident in the in the occupational indicators of selected advertised jobs.

To meet this goal, three studio projects were undertaken, using industry-preferred 3-D animation software programs to generate first-hand, practice-related data for comparison with that derived from the on-going position description and role statements survey. These studio projects were designed to generate data relevant to the Australian Qualifications Framework (AQF) for levels 3-6, and therefore were ‘staged’ to match levels of ability from fundamental and general through to complex and specialized knowledge and skills. In the first studio project the focus was generic and foundational knowledge and skills. The second and third studio projects were concerned with increasingly more advanced knowledge and skills as derived from the industry data (job role descriptions). It was anticipated that these data would enable the identification of relevant occupational indicators. Thus the studio projects should be understood as driven by the research question, rather than by the artistic interests of the researcher.

### Data Analysis and Training model design

National Jobs within the Computer animation, Games, Post Production, Interactive media/Web sectors of the Digital Media\Content Industry have been collected and collated regularly since January 2001: the data has been obtained from advertised positions in: the Digital Laborers Federation [www.dlf.org.au](http://www.dlf.org.au), [www.it.seek.com.au](http://www.it.seek.com.au) and [www.mycareer.com.au](http://www.mycareer.com.au). Total number of jobs posted from January 2001 to December 2006: **3152**. Total number of job titles advertised: **310**.

**Table 1:** Number of jobs advertised per year



Job growth in this field has been substantial over the past five years. “This is a high growth industry, growing faster worldwide than other economic sectors” (DCITA (2) 2005:1). While jobs posted are a good indication of skills-gaps and job role requirements they are not the only indicator of jobs available within this industry sector. “For many positions, companies will draw on a pool of existing freelance talent both local and international and therefore will not advertise the position” (Smith 2002). If this is common practice among larger companies then not all jobs are being

advertised and the total number of jobs advertised might be considered quite conservative in relation to the actual number of jobs available in the industry.

For training purposes it might seem feasible to develop qualifications based on job titles alone reflecting the role of individual talent within the industry sector. However, it would not be practical, economically feasible or ethical to create or offer a course of study with an award as a qualification for each of the 310 job titles collected. Some jobs were advertised on one or two occasions only. Merging the jobs into similar categories with generic titles and a focus on workplace expectations as well as the learning process would enhance the flexibility and currency of the Training Framework.

A process of categorising jobs was required. Each job role descriptor or occupational indicator for every job appeared as; an attitude, experience, skill, knowledge, quality or qualification. The occupational indicators for each job were subsequently grouped under each of the six headings.

**Table 2: Occupational Indicator classification system (Based on the findings of the job-data).**

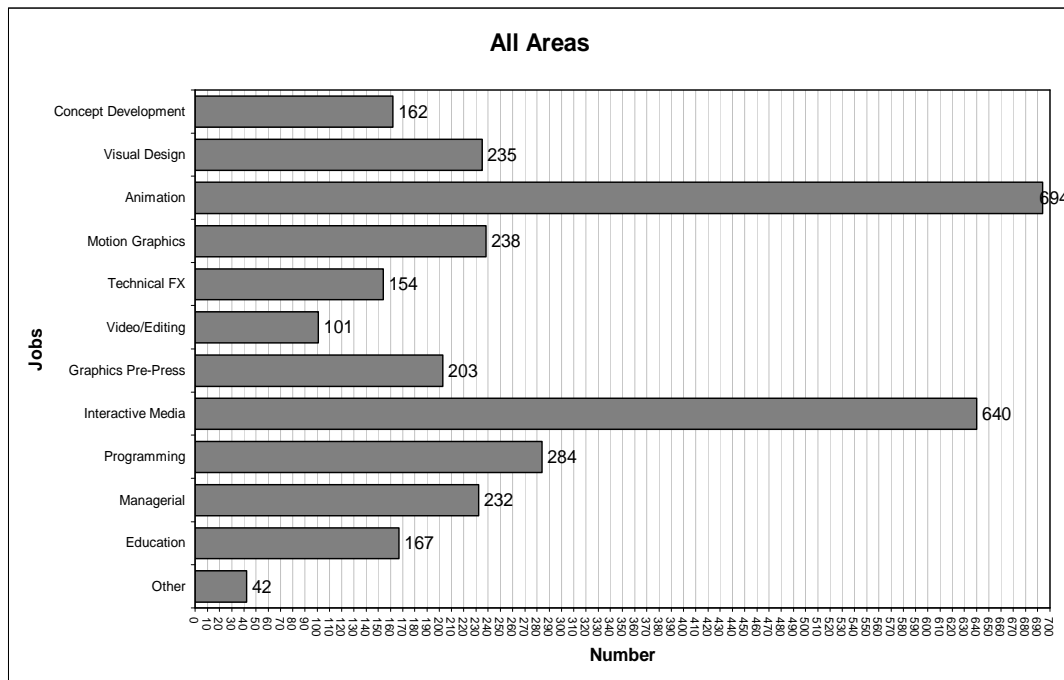
<b>A - ATTITUDE</b> (A state of mind or a feeling; disposition) Desire, passion, determination, work ethic, ability to follow/take directions, work independently, self motivated, work to tight deadlines, work fast and accurately, apply tools and temperament, objectives driven, enthusiastic, pro-active, confident, flexible, eager to learn, adapt, comply, work in a team environment under pressure, interest in..., love to..., have pride..., willingness, participation in..., client focused, adherence to..., interact positively, comfortable with...
<b>E - EXPERIENCE</b> (Active participation in events/activities, leading to the accumulation of knowledge/skills) Years experience, industry, professional, proven ..., proven ability, background, demonstrated, Senior, provide a showreel, demoreel, folio, references, evidence of..., working knowledge of..., expertise
<b>S - SKILL</b> (Proficiency, facility, or dexterity that is acquired/developed through training or experience) Ability to..., able to..., advanced level, have a strong..., competent, create, design, develop, deliver, edit, fine tune, proficient, mastered, perform specific tasks, construct, set up, skill-set, application of..., plan, assemble, problem solve, prioritise, multitask, generate, build, configure
<b>K - KNOWLEDGE (Professional)</b> (Familiarity, awareness, or understanding gained through experience or study) Knowledge of..., an understanding of..., familiar with..., liase with..., interpret, provide input, reporting to..., responsible for..., work with..., manage..., review and assess, supervise and critique, consultation, all aspects of..., analyse and structure..., integrate appropriate..., monitor, update, evaluate, leadership, contribute to..., awareness of..., assist, advise, provide direction, test and verify, learn, oversee
<b>Q - QUALITIES</b> (A personal trait, especially a character trait) Creative..., natural ability, obsessive eye..., eye for detail, be fast, charismatic, enjoy exploring..., fresh, original, good/great sense of..., organised, reliable, punctual, talented, general ... aptitude, flair, friendly, outgoing, A Grade, World Class, Guru
<b>Y - QUALIFICATIONS (Formal)</b> (An accomplishment that makes a person suitable for a particular position or task) Formal Certificate, Diploma, Advanced Diploma, Bachelors Degree, Masters, Post Graduate qualification, Related license, Blue Card

Using the classification system in Table 2, clear distinctions could not be made between the required attitudes, experience and qualities of the different jobs and formal qualifications could not be compared as they were not asked for in every job. The skills and knowledge required for each job offer distinct characteristics that were used to classify each job into a particular category.

The most frequently advertised positions were used as initial categories; Web design developer, 3D Computer Animator, Maya Artist/Animator, Composer, Graphic Designer/Illustrator, Programmer, 3D Modeller, Character Animator, 3DS Max Artist/Animator, Flash Animator or Digital Video Editor. Jobs that required similar skill-sets, knowledge and software were grouped under these categories with the final categories being assigned more generic titles as areas of study; Concept Development, Visual Design, Animation, Motion Graphics, Technical FX, Video/Editing, Graphics Pre-Press, Interactive Media, Programming, Managerial, Education and Other.

This model maintains a level of shared aims and skill-sets within each group while allowing for the broad nature of the entire industry sectors jobs to be addressed.

**Table 3: Job numbers & categories based on similarity of skill-sets and knowledge**



The significance of grouping jobs into areas of similar skill-sets Table 3 is motivated by curriculum planning, delivery and economic needs. This model enables cohorts of students access to training that is a direct response to skills shortages in this industry sector and is based on the increasing convergence of production areas. The ability for individuals to effectively apply and transfer their learned skills and techniques to a variety of context's or different types of production is a life long vocational goal that might only start in these formative years of an individuals vocation.

Convergence is changing and blurring the boundaries between once separate components of the content industries. A commonly cited example in the content area is the convergence of the film, animation and electronic games industries. The convergence of technologies and content areas has created a need for each individual

to attain a divergent set of employability skills and knowledge while still acknowledging the distinct areas of Production, such as; Broadcast, Feature Film/Short Film, Computer Games, Television Commercials, Visualisation etc.

In a convergent digital content industry, a common set of skills (whether artistic, technical or business-oriented) may now be applied elastically in multiple contexts, thereby increasing the value of those skills (DCITA(2) 2005:13).

The areas of concept development, visual design, animation, video/editing, motion graphics, technical FX, graphics pre-press and interactive media all have a strong visual design and creative focus within a digital context. Knowledge of the following common skills and processes is a general requirement these areas:

- General computing, file management, research skills, word processing;
- Workplace - health & safety, communication, working in teams, time management techniques, systems and protocols;
- Digital image acquisition, vector graphics, image manipulation, input/output, file formats, authoring fundamentals;
- Digital Design Studies – elements & principles design, composition & layout; and
- Visual Narrative – screen language, pre-viz, animatics, animation principles.

Craft skills and experience with software were identified as the most requested skill-sets, followed by communication and interpersonal skills, artistic ability and design skills, team work, time management skills and industry experience. Business skills and enterprise development skills have only been asked for in select managerial positions, not as generic requirements across the sector.

## **Conclusion**

The initial broad question guiding the study was “What knowledge and skills do animators need to perform in contemporary animation workplaces and how can they be organised and clustered in terms of a progression of qualifications in the Australian Vocational Education and Training competency based system?” A practice-driven inquiry was utilised to identify what, where and how new learning and professional development (training) needs can be supported to keep a Training Framework in Digital Media up-to-date for the long term economic survival of the industry. Data collected from a substantial ongoing review of skills-shortages and workplace requirements that were routinely available through job postings in the related industry sector was analysed.

An overall picture of industry needs emerged that was utilised as an objective foundation for applied (practice-based) research to support the development of a Vocational Training Framework, presented in Table 4 Proposed overview for Vocational Qualifications in Media. Meaningful qualifications are flexible and transferable as units can be selected from columns for specialisation and progressive skill development or mixed and matched from rows for a general qualification.

<b>Table 4 Proposed overview for Vocational Qualifications in Media</b>						
<b>Certificate III Media - AQF Level 3</b>						
General computing, file management, research skills, word processing. Digital image acquisition, vector graphics, manipulation, input/output, file formats, authoring fundamentals Workplace - health & safety, communication, working in teams, time management techniques, systems and protocols. Digital Design Studies – elements & principles design, composition & layout. Visual Narrative – screen language, pre-viz, animatics, animation principles.						
<b>Certificate IV Media – AQF Level 4</b>						
<i>Concept Development</i>	<i>Visual Design</i>	<i>Animation</i>	<i>Video/Editing</i>	<i>Motion Graphics</i>	<i>Technical FX</i>	<i>Interactive Media</i>
Drawing - Figure, concept art & storyboard development Character design & Acting techniques 3D Modelling/Animation techniques (Low polygon)			Colour grading & Keying techniques Prepare assets & Data Management Digital Editing operations		Math/Physics Dynamics & Scripts Shader development	Interface analysis 2D Design/Animation Interactive design
Illustration Level or scene design Interface/Style design Game play mechanics	3D Modelling – Hi Poly/NURBS Organic Rigging, Texturing Lighting, VFX & Rendering 2D/3D Animation principles/techniques		Camera techniques Editing techniques Audio techniques Transitions & effects	Digital mattes Particle systems Rotoscoping Composite CG & live	Rigging techniques Particle systems Custom Shaders Caustics & Lighting	Interface design Asset acquisition Editing techniques Authoring
<b>Diploma Media - AQF Level 5</b>						
<i>Concept Development</i>	<i>Visual Design</i>	<i>Animation</i>	<i>Video/Editing</i>	<i>Motion Graphics</i>	<i>Technical FX</i>	<i>Interactive Media</i>
Script/Story writing 2D/3D asset design Storyboards Asset inventories Mission walkthroughs	Applied animation 2/3D asset production Environment Design Visualisation In-game Cutscenes	Applied animation Character animation Facial animation Image enhancement CG Composite/Edit	Applied Camera Non Linear Editing Applied Audio Visual Enhancement Output & archiving	Rig Removal Digital Compositing VFX Elements Camera matching Grading & finishing	Character setup Scripting Advanced VFX Scene compositing Render management	2D/3D asset design Content production Database management Coding/Scripting Testing & packaging
Small Group Project	Small Group Project	Small Group Project	Small Group Project	Small Group Project	Small Group Project	Small Group Project
<b>Advanced Diploma Media - AQF Level 6</b>						
Individual or Group Project Work Placement, Work Simulation or Internship						



The emergence of digital technologies has had an impact on the associated job processes, skills, knowledge and related industry production workflow. A project based approach to the digital medium is required, one that seeks to train and educate animators, artists and designers of movies, games and web, by integrating the building blocks of art, design, animation and screen language in a team environment. Continuous improvement through progressive skill development and transfer is proposed as an evaluation strategy for creative activities and projects, augmenting the existing Vocational Training competency based system.

Gathering and analysis of job role descriptors from related job advertisements is proposed as a new skills strategy for the Creative Industries sector. This process has enabled the development of information that, if continued, will inform industry and VET forums of the current status of industry needs allowing an improved base from which to make projections about emerging occupations and future skills needs. While acknowledging and supporting the existing National Training Package review and liaison process, it is recommended that a process of continuous improvement is implemented through an annual skills-audit, analysis and categorization of jobs in this sector which will inform the review with hard data and new up-to-date facts.

## **Acknowledgements**

Mr Keith Bradbury  
Dr Glenda Nalder  
Professor John Stevenson

Australia Research Council  
Griffith University:  
Queensland College of Art and The Centre for Learning Research  
The Brisbane City Council  
South Bank Corporation  
The Creative Industries Skills Council  
Metropolitan South Institute of TAFE

## **References**

Australian National Training Authority ANTA 2001, *CUF01 Film, Television, Radio, Multimedia Training Package*, Melbourne.

Department of Communications, Information Technology and the Arts DCITA (1) 2005 *Australian Digital Content Industry Futures*, Centre for International Economics, Canberra.

Department of Communications, Information Technology and the Arts DCITA (2) 2005 *Unlocking the Potential*, Digital Content Industry Action Agenda Strategic Industry Leaders Group.

Report to the Australian Government, Canberra. Retrieved April, 2006, from [www.dcita.gov.au/arts/film\\_digital/digital\\_content\\_industry\\_action\\_agenda](http://www.dcita.gov.au/arts/film_digital/digital_content_industry_action_agenda)

Department of Culture, Media and Sport DCMS 2002, *Creative Industries Fact File*, Retrieved, April, 2006 from [http://www.culture.gov.uk/PDF/ci\\_fact\\_file.pdf](http://www.culture.gov.uk/PDF/ci_fact_file.pdf)

Kemmis, S, McTaggott, R 1988, *The Action Research Planner* (3<sup>rd</sup> ed), Deakin University, Geelong.

Mansilla, VB, Gardner, H 2004, *Assessing Interdisciplinary Work at the Frontier. An empirical exploration of 'symptoms of quality'*, Retrieved October, 2004, from <http://www.interdisciplines.org/interdisciplinarity/papers/6>. 2004

Servais, R 1996, *An Interview*, Retrieved January, 2006, from <http://www.awn.com/mag/issue1.5/articles/moins1.5.html>

Smith, (Photon\_VFX) 2002, Workplace assessment industry visit. Gold Coast

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