

# **Critical skills of entry level animators in the contemporary South African computer animation industry**

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Dissertation submitted in fulfilment of the requirements for the degree of  
*Magister Technologiae*: Multimedia in the Department of Visual Arts and  
Design, Faculty of Human Sciences, Vaal University of Technology.

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## **DECLARATION**

I, Mashaole Jacob Makwela, hereby declare that this dissertation is my own independent work, except where otherwise stated. The dissertation has not previously been submitted at any other university. All sources are acknowledged, giving explicit references.

Signed:

A handwritten signature in black ink, consisting of a large, stylized capital 'M' followed by a horizontal line and a small flourish.

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- My wife Nontsikelelo Makwela for her patience and encouragement.

## **DEDICATION**

This dissertation is dedicated to my wife Nontsikelelo Makwela.

## **ABSTRACT**

This study investigates the views and opinions of computer animation practitioners about the critical skills required for entry level animators in computer-generated or digital animation design in South Africa. The literature review chapters of the study clarify the terms animation and creativity, examine the changes taking place in the animation discipline, and discuss the relative roles of technical and creative skills in computer animation productions, primarily based on Amabile's componential model of creativity. The chapters that deal with the fieldwork describe the sequential mixed-methods design which was followed in this study to gather data in two phases, namely a survey with questionnaires ( $n = 16$ ), and interviews ( $n = 7$ ) at thirteen South African companies, six in Johannesburg and seven in Cape Town. The main aim of the first phase was to determine (a) which skills are considered more important for entry level animators, (b) whether technical skills or creative skills are considered more important in the selection process for new animators, and (c) whether institutions teaching computer animation should focus on technical skills or creative skills. The main aim of the second phase was to augment the questionnaire results with more detailed explanations. The results of the first phase indicate that according to the respondents computer animation education should focus primarily on creative skills. The results of the second phase confirm that creative skills are regarded as more important, and also elaborate on a number of factors, including job level, the nature of the company, and company size, which the respondents considered important during the first phase of data collection. The information gathered in the course of this study can be used directly by entry level practitioners, experienced animators and design students. The results can also guide the development of the South African animation industry and the revision of multimedia curricula.

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## LIST OF ABBREVIATIONS

2D	Two-Dimensional
3D	Three-Dimensional
AFDA	African Film Drama Arts School
AI	Artificial Intelligence
B.C.	Before Christ
CD-ROMS	Compact Disc – Read Only Memory
CERN	European Partial Physics Laboratory
CGI	Computer Graphics Interface
DTI	Department of Trade and Industry
DV	Digital Video
DVD	Digital Versatile Disc
ENIAC	Electronic Numerical Integrator and Computer
ERA	Engineering Research Associates of Minneapolis
GPS	Global Positioning System
HDTV	High Definition Television
HTML	Hyper Text Mark-up Language
IBM	International Business Machines
INCPT 1	Interviews Cape Town 1
INJHB 1	Interviews Johannesburg 1
LCD	Liquid Crystal Display
MIT	Massachusetts Institute of Technology
MPEG	Motion Picture Engineering Group
OED	Oxford English Dictionary
PDI	Pacific Data Images
QWERTY	Standard Layout on English Language Keyboard
SABC	South African Broadcast Corporation
SETA	Sector Training Authority
TV	Television

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction to the field of study

The use of computers in production processes, distribution, text and consumption has transformed the image of the established media in one way or another. The major changes can be seen in terms of the emergence of a new aesthetic in image-making (Lister, Dovey, Giddings, Grant and Kelly 2003:97). The use of computers has also affected the field of animation from production to distribution (Wells 2002:2; Crawford 2003:110; Wells & Hardstaff 2008:14). Since the 1980s, animators have been experimenting with computer animation, trying out new styles and new techniques (Beck 2004:266). This has led to successes in films such as *Toy Story* (1995) (Crawford 2003:110; Darley 2003:82). The successes of the CGI (Computer Graphic Interface) animated features reflected in the box office returns have affected many animation studios, including Disney and DreamWorks, prompting them to consider new directions in computer animation (Beck 2004:338). In South Africa, *Character Matters* in 2006 was already in the production stages of a 60-minute 3D computer animation film entitled *Zambesia*. Other animation productions included the animated television series *URBO: the adventure of Pax Africa* for the SABC channel 3 by the Clockwork Zoo studio (2006:7).

These changes have presented opportunities and challenges not only to the major animation studios but also to animators, new as well as established. These challenges have brought such animators face to face with new challenges in animation production. They need to acquire high levels of technical skills in the operation and application of specific animation computer programs (Furniss 2007:176). The research findings by Chapman, Fisher, Ashworth and Reavey (1997:40) revealed, however, that although

most of the students become competent in the use of computer software; they struggle to apply such skills to generate creative products. In a similar vein, Wells and Hardstaff (2008:148-149) argue that “creativity is a largely taken-for-granted aspect of the process when talking about artistic activity. It is essentially a given element informing any arts-based practice. It is worth stressing that creativity in the animated form operates at any level; it is not merely an imaginative process, but one that involves problem-solving, technical choices and applications, and the ability to extrapolate concepts into a model of visualisation, which must necessarily move, change and advance”. These views presented by Wells and Hardstaff (2008:148-149) and echoed earlier by Chapman *et al.* (1997:40) and Furniss (2007:176), clearly present tensions between technical skills (in computer use) and creative skills (conceptual/innovation) in animation.

## **1.2 Problem statement**

Technical skills are the pillar of any production line. Hume and Sizer-Coy (2009:20) state that high levels of technical skill in 3D computer animation are very important for the people entering the animation industry. One related problem with highly skilled people in the operation of computer programs is that they lack creative skills to generate cogent concepts (Wells and Hardstaff 2008:18). According to various authors, researchers and practitioners creativity in animation production is more important than the application of technical skills (Pricken 2004:14-28; Tschang and Goldstein 2004:10; Wells and Hardstaff 2008:18). Specific problems with both opposing views are that (a) technical and creative skills should contribute equally in the production process of a creative product (Conti, Coon and Amabile 1996:385; De la Harpe 2006:23). (b) In order for new animators to secure jobs in smaller computer animation companies they must have a good balance of both technical and creative skills, while in bigger companies they can choose to specialise (Wells & Hardstaff 2008:19). This sequential, explanatory, mixed-methods study examines the views of animation directors, lead animators, animation supervisors and animators in 24 South African

companies on the critical skills required in computer-generated animation for entry level animators or new animators. The results of this study may provide new animators or students with information relating to skills that South African computer animation companies look for in new animators. This study can also be used to inform training programmes, interventions in the animation industry and the development of educational curricula in South Africa.

### **1.3 Research question**

This study seeks to engage with these three primary questions:

- What are practitioners' views and experiences of computer animation in relation to the critical skills required for entry level animators?
- Which of the two sets of skills – technical or creative – is considered more critical for entry level animators in their selection process?
- Should institutions teaching computer animation focus on technical skills or on creative skills?

The following subsidiary questions were used with the intention of addressing and supporting the core questions of the study:

- What is the meaning of the term *animation*?
- What are the major current changes in animation production?
- What are the views of the animation directors, lead animators, animation supervisors and animators in 24 South African companies with regard to the main research question of the study?

### **1.4 Aims of the study**

This study critically engages with the views on two types of skills which entry level animators are required to acquire in order to secure animation jobs. This was done with the intention of determining the views of the practitioners at 24 South African companies regarding this issue as it plays out in their selection process for junior positions.

The following aims were formulated in order to guide the study:

- To clarify the meaning of the term *animation* and to examine the historical developments in computer-generated animation, internationally and nationally with specific reference to South Africa. This provided a platform from which to discuss the relative roles of technical and creative skills and to examine the views of the practitioners at 24 South African companies in this regard.
- To conduct a questionnaire survey and to interview practitioners at 24 South African animation companies in order to establish the views mentioned above.

### **1.5 Limitations of the study**

There is a void in South African research with regard to studies of this kind. Many of the theories used in this study have been sourced from Western and European literature e.g. media studies, communication sciences, cinema, animation, psychology and visual arts. Theories interrogating various implications of the use of computers in animation are still being formulated. The study could have been conducted differently with more developed theories or models on how to determine or measure the relative importance of technical and creative skills in computer animation. Secondly, the size of the animation industry is small. Some major animation studios, mainly in Cape Town, have been liquidated or are in the process of liquidation. Other companies could not be contacted for a number of reasons, such as outdated contact details, telephones not answered or researcher being directed to voice mail. Lastly, most of the companies could not participate owing to tight schedules or deadlines. The population of the study could have been larger.

### **1.6 Delimitations of the study**

This study is delimited to animation, with the specific focus on computer-generated animation or digital animation within the filmic tradition of cinema. However, other related animation platforms, such as interface and game animation, are also discussed. The discussion of the medium of animation is

grounded in no specific theoretical perspective; however, specific reference is made to the writings of Furniss (1998), Williams (2001), Bowman (2002), Peacock (2002), Wells (2002), Beck (2004), Lord and Sibley (2004) Wright (2005), Manovich (2006) and Wells and Hardstaff (2008). In terms of the conceptualisation of creative skills, reference was made to various definitions and their underlying theoretical frameworks. These include the writings of Taylor (1988), Hayes and Mellon (1990), Weisberg (1992), Boden (1994), Csikszentmihalyi (1996), Candy and Edmonds (1999), De la Harpe (2006, 2007), Bilton (2007), Russ (2007), Shneiderman (2007), and Rzedkiewicz (2009). Technical skills are conceptualised and discussed from the psychomotor perspective (the development of manipulative skills in the arts) as described by Krathwohl (2002) and revised from Bloom's Taxonomy (1956) of educational objectives and technological knowledge (Feenberg 1996). The framework for the discussion on how technical skills relate to creative skills is based on Amabile's (1996) three interacting components of the componential model of creativity. This model of creativity suggests that domain-relevant skills and creativity-related skills contribute equally in the production process of a creative product. Further reference was also made to the writings of Chapman *et al.* (1997), Pricken (2004), Tschang and Goldstein (2004), Kerlow (2008), Wells and Hardstaff (2008), and Hume and Sizer-Coy (2009).

According to Struwig and Stead (2001:119), it is commonly accepted in theory that the larger the size of the sample, the better the chances of gathering reliable data, but one should also consider practical constraints. Therefore, owing to the practical constraints of the study, a sample size of 24 companies, 12 in Johannesburg and 12 in Cape Town, was deemed to be adequate for this study. However, a larger sample would have been ideal. Thirteen companies, involving a total of 16 people, participated voluntarily and 7 people were interviewed.

## **1.7 Definition of terms**

### **1.7.1 Animation**

*Animation* pertains to a process of creating the illusion of movement by means of character performance or visual effects using different techniques (e.g. computer graphics interface, the cartoon conventions, stop motion) with the goal of telling a story or communicating a message (Denslow 1997:1; Furniss 1998: 4-6; Sullivan *et al.* 2008:31; Wells 2002:3-4).

### **1.7.2 New media**

*New media* can be understood as the transformation of the old media's production processes, distribution, text and consumption of information into a moving image form through the use of electronic devices and the computer (Manovich 2001:20; Harries 2002:1; Lister *et al.* 2003:9; Subraman 2005:3).

### **1.7.3 Creative skills**

*Creativity* can be referred to as the ability to generate novel ideas through any technical limitations in an individual production process or in a team effort (Bilton 2007:3; Taylor 1988:118-119).

### **1.7.4 Technical skills**

The term *technical* can be understood as any advanced special knowledge and the application of tools (computers) related to a specific discipline (Concise Oxford English Dictionary (OED) 1999:1470; Feenberg 1991:27; Herschbach 1995:1; Mitcham 1994:235).

## **1.8 Methods and procedures**

Both the main and the sub-questions were answered by following the procedure set out below:

- A literature review and internet search was undertaken and the search for the relevant information was guided by the following keywords: animation, computer-generated animation, new media, creativity, technical, remediation and domain-relevant skills.



- DVDs of the animated films and the documented interviews from behind the scenes of the making of computer-generated animations were also used to support the literature review.
- To collate data, a sequential mixed-methods design was used involving two phases: (a) a survey with questionnaires involving 24 South African companies (12 in Johannesburg and 12 in Cape Town) and (b) semi-structured interviews with 7 participants. This process can be described as a sequential mixed method (Tashakkori & Teddlie 1998:149) or a sequential explanatory design (Bergman 2008:69). Both quantitative and qualitative research methods were used, with the one approach complementing the other. The first phase was aimed at establishing the practitioners' views at 24 South African companies on (a) which skills are considered more important for entry level animators, (b) whether technical skills (use of computers) or creative (conceptual) skills are considered more important in their selection process for new animators, and (c) whether institutions teaching computer animation should focus on technical skills or creative skills. The aims of the second phase of data collection were to gather more information and to confirm or refute the results of the questionnaire survey.

### **1.9 Chapter division**

**Chapter 2** discusses the meaning of the term *animation*. An analysis of the historical developments of computer-generated animation internationally and specifically to a South African context is also addressed. Lastly, a discussion on how animation relates to new media is presented. This chapter clarifies the meaning of animation and it also provides a context within which the critical skills required for entry level animators in computer-generated animation can be discussed.

**Chapter 3** presents a discussion on the relative roles of technical skills and creative skills in general and then specifically in computer-generated

animation. It further defines, discusses and analyses the meaning of the terms *technical skills* and *creative skills*. This is done in order to provide a framework in which the views of the practitioners at 24 South African companies can be examined.

**Chapter 4** discusses the data collection methods and procedures used in this study. Two phases were involved, namely (1) the application of a questionnaire survey and (2) interviews. Issues such as the design of the questionnaire, piloting, the study population and the interview schedule were of importance in this process.

**Chapter 5** reports on and discusses the results of the questionnaire survey and interviews. It further provides an interpretation of the results and an evaluation of the research question.

**Chapter 6** presents a summary of the preceding chapters, the contribution of the study to the field, recommendations that arise from the study and suggestions for further research.

## CHAPTER 2

### DEFINING ANIMATION

#### 2.1 Introduction

According to Denslow (1997:1), animation can be defined from the perspectives of historical development, or from production or marketing requirements and aesthetic preferences. Wells and Hardstaff (2008:48) also describe numerous contexts in which animation can be made, e.g. from major production houses to individual productions. It is also suggested by Kuperberg (2002:14) that animation informs different media in different ways and for different purposes. For example, animated sequences can be adjusted and resized to suit the different requirements of various media for exhibition purposes on TV, video, film, website, DVD or CD-ROM, among others. One of the main special characteristics of animation is that it consists of many styles and techniques, including puppet or model animation, sand on glass, cut-out and silhouette animation and computer-generated animation, among others (Wells 2002:4; Lord & Sibley 2004:17- 66). In considering the multi-faceted nature of animation, the focus for this study is primarily, but not exclusively, concerned with computer-generated animation or digital animation. Traditional two-dimensional (2D), three-dimensional (3D) animation and visual effects are briefly discussed or referred to as examples. The reason for this approach is that animated films such as *Prince of Egypt* (1998) and *Chicken run* (2000), among others, combined traditional methods and the computer-generated sequences in their production processes.

In order to clarify and to examine changes affecting animation production internationally, and in a specific South African context, this chapter is structured as follows: firstly, it presents a definition and discussion of the meaning of the word *animation*. Secondly, historical developments of computer-generated animation will be presented in order to help to explain

the emergence of computer animation. Thirdly, the issue of how animation relates to new media will be discussed. Lastly, there will be a discussion of the development of animation in the South Africa context. The discussion will be grounded in no specific theory; however, specific reference will be made to the writings of Furniss (1998), Manovich (2001), Bowman (2002), Peacock (2002), Wells (2002), Crawford (2003), Darley (2003), Lister *et al.* (2003), Beck (2004), Wright (2005), Manovich (2006) and Wells and Hardstaff (2008).

## **2.2 The meaning of animation**

As stated above, animation can be defined from different perspectives and also for different purposes. In this study I do not intend to provide a precise definition but to identify possible definitions that will be relevant to guide the study. The most basic definition of the word animation comes from the Latin word *anime* meaning “to make alive or to fill with breath” (Wright 2005:1). According to the same source this means that drawings, clay, puppets, or forms on a computer screen are made to seem real and to come ‘alive’. This definition refers to the illusion of movement and to techniques of animation. It does not say much about how the illusion of movement is created. Denslow (1997:1) uses Webster’s dictionary as the fundamental source of the definition of animation: “a: a motion picture made by photographing successive positions of inanimate objects, b: animated cartoon, a motion picture made from a series of drawings simulating motion by means of slight progressive changes”. The emphasis in this definition is on the traditional animation techniques such as cel animation and stop motion. Furniss (1998:4-5) describes two factors which Charles Solomon (*In Animation: notes on a definition*) used as a workable definition of animation, namely “the imagery is recorded frame by frame and the illusion of motion is created rather than recorded”. Denslow (1997:2) summed up the use of the term animation by The Association of International Film Animation (ASIFA) as “not live action”. In academia, Denslow (1997:3) suggests that definitions such as ‘created performance’ are used. These definitions do not take into account changes

taking place in animation, such as the use of animation in live action films, and computer games.

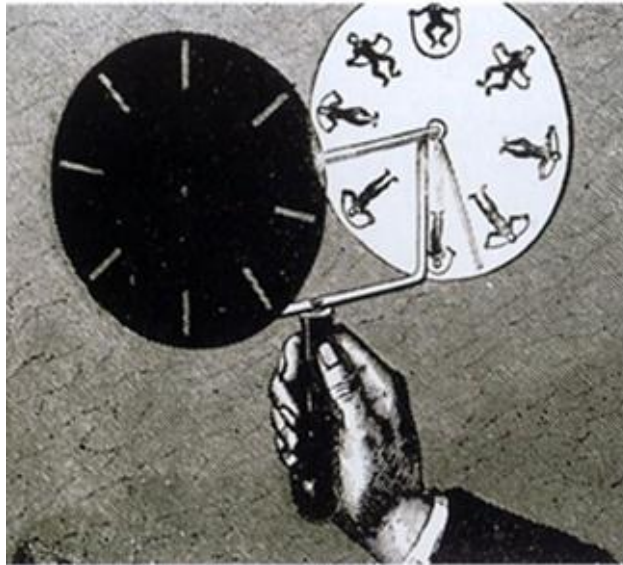
Other perspectives of the definition of animation are centred on movement and narrative. Laybourne (1998:12) defines animation as an art in movement, which exists on many levels and which manifests itself in many ways, such as telling a story or character performance. Sullivan, Schumer and Alexander (2008:31) also define animations as “constructed films that tell stories through movement and time, through memorable characters living the exaggeration of life in a presentation of the world with the ability to make the invisible and the impossible”. Wells (2002:3-4) quotes Preston Blair (1994:6), veteran animator: “Animation is both art and craft; it is a process in which the cartoonist, illustrator, fine artist, screenwriter, musician, camera operator and motion picture director combine their skills to create a new breed of artist – the animator”.

Although clarity regarding the definition of animation is desirable, Wells and Hardstaff (2008:7) suggest that the only way to come up with a workable definition of animation is to “re-explore animations through the intentions of its creator and the context in which it is made”. They further assert that this approach will provide a broader spectrum, which allows animation to be interrogated in a cross-disciplinary, interdisciplinary and multidisciplinary setting. This view is also reflected by Denslow (1997:2), when he states that “the industry has to define an animator by function”. Denslow (1997) further provides two examples in order to clarify his point. The first example is related to the production of the first season of *The Simpsons* television series. He states that the studio that produced this television series preferred not to use the job title ‘animator’ for the workers who drew key poses of the scenes, but ‘character layout artists’. His second example is based on the computer animation studio which preferred to use ‘technical director’ for the person who animates on the computer.

Acknowledging the above definitions of animation, this study refers to animation as a process of creating the illusion of movement by means of character performance or visual effects using different techniques (e.g. computer graphics interface, the cartoon tradition, stop motion) with the goal of telling a story or communicating a message (Denslow 1997:1; Furniss 1998: 4-6; Wells 2002:3-4; Sullivan *et al.* 2008:31).

### **2.3 The historical developments of computer-generated animation**

The historical developments of both animation and computing can be traced as far back as the prehistoric cave paintings and the Salamis tablet believed to be used by Babylonians circa 300 B.C. Only after the nineteenth century did the development of animation and computers show greater advancement. In the nineteenth century, magic lanterns were used in most parts of Europe instead of cameras to create moving images. Most of the optical illusion objects or toys were invented in that era. For example, the Belgian physicist Joseph Plateau developed the *Phenakistiscope* to create the optical illusion of movement in 1832. A sequence of images was painted or drawn around the revolving disk with slightly different poses and attached to the Phenakistiscope (see Figure 2.1). Viewers spun the disk in front of a mirror and looked through slots; as a result the sequence of images came to life (1995:3). In 1872, Eadweard Muybridge recorded the movement of a horse by using still cameras as part of his photographic tests. He attached 24 strings to 24 cameras along a racetrack so that when the horse raced down the track the strings broke, triggering the cameras (1995:4). As a result, the assembling of photographs into motion pictures was possible. In 1893 the first movie studio released Edison's *Black Maria* and the Lumière brothers exhibited their new cinematographic camera to the public in 1895 (Manovich 2001:23).



**Figure 2.1:** The Phenakistiscope, 1832, invented by Joseph Plateau (Source: Beck, J. (ed.). 2004).

*Humorous Phases of Funny Faces* (1906) by J. Stuart Blackton (1875-1941) is said to be one of the first animation films to experiment with the standardisation of the animation production processes. This is an animated cartoon sequence produced by using a frame-by-frame technique with pictures drawn in chalk (Beck 2004:13). Emile Cohl in 1908, in his first animated film titled *Fantasmagorie* (1908) also used a drawn frame-by-frame sequence technique, but with a different approach from Blackton's. According to Beck (2004:23) Cohl used "a process of drawing the respective movements on white paper in thick block lines and then printing the results on negative film which, he decided, looked better than in positive." Winsor McCay (1867-1934) was among other important figures in the early development stages of animation. In 1911, his animated film *Gertie the Dinosaur* (1914) is believed to be the first to have a star and a story line. In later years McCay experimented with mixed media in the production of *The sinking of the Lusitania* (1918), with 25 000 drawings (Williams 2001:17; Beck 2004:20; Lord & Sibley 2004:25). The advancement of animation from where McCay left it, was promoted by leading animation figures such as Walt Disney (the creator of Mickey Mouse), Pat Sullivan (the creator of Felix the

cat), Otto Mesmer and Dave Fleischer (creators of the *Out of the Inkwell* series), Paul Terry (*Aesop's fables*) and Walter Lantz (*Dinky Doodle*) (Beck 2004:17-21; Lord & Sibley 2004:25; Williams 2001:17).

The development of computers appeared as a result of the greater use of mechanical and electrical tabulators and calculators, and various possibilities of forms of media storage materials such as film stock in the nineteenth century (Manovich 2001:22-23). The examples of mechanical and electrical tabulators and calculators include the Analytical Engine developed by Charles Babbage in 1833 with the ability to input data, store data and perform mathematical calculations. Another example is the loom, invented by Jan Jacquard, which was used for making fabric to weave figurative images in 1800. These developments, according to Manovich (2001:22), already began to incorporate images at this stage. Other developments include the invention of the QWERTY keyboard typewriter by Christopher Sholes in 1896 in the United States of America and the establishment of IBM (International Business Machines Corporation) (Computer Hope n.d.).

In 1938, Konrad Zuse created the Z1 computer. This computer is considered to be one of the earliest computers that could be controlled and that performed numerical representation by means of punch tape (IT solutions 2003). In 1943, ENIAC (Electronic Numerical Integrator and Computer) started building the first general-purpose electronic digital calculator (Fig. 2.2). However, the card accounting machine constituted the only hardware at hand. The calculations were executed by dozens of people in a computer room (Dyson 1997:83).





**Figure 2.2:** Photographer unknown. 1943-1946, electronic digital calculator “Programmed: plug board and switches, Speed: 5,000 operations per second, Input/output: cards, lights, switches, plugs. Floor space: 1,000 square feet” Retrieved from <http://www.computerhistory.org/timeline/?year=1946>.

At a symposium in Cambridge in 1947, Alan Turing presented his philosophy paper on Turing’s machine, which consisted of a black box able to read and write a finite alphabet of symbols to and from a finite but unbounded length of paper tape and capable of changing its own “m-configuration” or “state of mind” (Dyson 1997:55). Such ideologies were further developed by institutions such as Engineering Research Associates of Minneapolis (ERA). In 1950 ERA built the first commercial computer, the ERA 1101. This computer consisted of a magnetic storage device drum which had the capacity of 1 million bits. The computer was also able to record and retrieve data (Computer History Museum n.d.). According to Furniss (2007:178), Valliere Richard Auzenne identified seven American institutions which played an important role in the development of computer animation. The institutions identified included The Massachusetts Institute of Technology (MIT), The University of Utah, Ohio State University, Lawrence Livermore National Laboratory, the Jet Propulsion Laboratory (JPL), Boeing, and Bell Telephone Laboratories. Furniss (2007) further explains that artists and developers collaborated in experiments for government research projects at this stage.

The early use of computer-generated animation is believed to have been developed for defence purposes in the 1940s and 1950s. Early examples of animation methods are related to radar detection. Computer animation techniques were also tried out in film, but they were used partially in feature films in the form of visual effects. This can be seen in films such as *West World* directed by Michael Crichton in 1973 (Furniss 2007:178). In this regard, Manovich (2001:16-22) suggests that animation (the Phenakistiscope, Daguerre's daguerreotype and Lumière cinematographic) and computer (Babbage's analytical engine and Hollerith's tabulator) merged into one. Graphs, moving images, sounds, shapes, spaces and texts became sets of computer data.

In the 1980s computers were accessible to animators for experimenting with new styles and new techniques (Beck 2004:266). According to Furniss (2007:179), PDI (established in 1980), Cranston-Csuri (established in 1981) and Lucasfilm's computer-animation division (established in 1980 and later named Pixar) were among the leading animation houses in the development of computer animation. During the early stages of computer animation, the reception by both audience and practitioners was not good. Computer-generated character animations could not surpass or match the performance and the aesthetics of the traditional 2D animation. In response to the challenge, computer hardware and software suitable for artists was developed, such as Pixar Image computer (Furniss 2007:179). The potential in the use of computers by animators became real in the film *TRON* (1982). In later years, the quality and the magic of computer-generated animation was unleashed through the success of short films directed by Lasseter: *Luxo Jr.* (1986), *Red's dream* (1987), *Tin Toy* (1988), and *Knicknack* (1989). Lasseter used Pixar's 3D graphics software, RenderMan, in order to achieve the aesthetic and performance qualities in these short films (Furniss 2007:180).

The success of computer-generated animation led to companies such as PDI changing direction over the years by moving into television commercials, music videos, special effects for theatrical films and animated shorts. Commercials presented PDI with opportunities to explore the use of computers in animation (Furniss 2007:180). In 1995, *ToyStory* was produced by Pixar and distributed by Walt Disney (Crawford 2003:110; Darley 2003:82). Following the success of the early computer-generated animation films, most of the animation companies began to merge or to collaborate on projects. In 2000, PDI and DreamWorks merged to form PDI/DreamWorks and Pixar became part of Disney in 2006. The blending of traditional animation techniques and computer-generated animation also began to gain status (Solomon 1998:176-177). Examples of such reception by the animators and the audience can be seen in films such as *The prince of Egypt* (1998) in 2D animation and *Chicken Run* (2000) in 3D animation.

Today, computer animation techniques are used to aid live action films in cases where impossible situations cannot be achieved, for example in the creation of a supernatural and fantasy world in *The Matrix* (2003) and *Lord of the Rings* (2001-2003). Furthermore, a number of film production studios (like some of those in Hollywood) have abandoned traditional hand-drawn techniques, and Disney studios has down-sized its traditional 2-dimensional hand-drawn animation productions to develop 3D animation (Beck 2004:336).

## **2.4 How animation relates to new media**

The field of new media consists of various disciplines and it remains challenging to define such emerging fields in terms of where to start and where to end. One of these challenges is the question posed by Lister *et al.* (2003:38): “How to measure the word new?” It is therefore necessary to examine its meanings and parameters in order to understand how it relates to animation or vice versa.

The word *media* is understood as a plural form of the word *medium* (OED 1999:884). Hanclosky (1995:3), Bolter and Grusin (1999:98), Erasmus-Kritzinger (2004:3), and Fourie(2007:xxi) all describe the word *media* in both media studies and communication sciences as a collective form of mass communication such as television, radio, press, video, film, and the internet. According to the above description a single form of mass communication is referred to as a medium. In the animation discipline, however 'medium' refers to the material or technical means or process of artistic expression (Woolman & Bellantoni 2000:10; Manovich 2006: 1-14). For example, this can be seen in a production technique used to produce animated film where a stop motion technique was used to produce '*Chicken run*' (2000), while '*Toy Story*' (1995) used a 3D computer graphic interface.

According to Harries (2002:1), the term *new media* refers to "any means of digital delivery of media content via internet, DVD, digital television and CD-ROMS". He goes on to explain that the definition of new media is not only about the delivery, but that it also involves various media products which can be divided into five discrete sections, namely technologies, production, texts, consumption and contexts (Harries 2002:2). Subraman (2005:3) defines new media as "the burgeoning set of new technologies and skills. It includes the entire range of computer-based or computer-enhanced communication." Lister *et al.* (2003:9) refer to new media as a wide range of changes in the production, distribution and use in the media industry or setting. Manovich (2001:20) defines "new media as the synthesis of both media and computation through computers and the convergence of graphics, moving images, sounds, shapes, space and text". New media functions as a plural. It also refers to multimedia, interactive media, online media, digital media and information and communication technologies (Harries 2002:x; Dijk 2004:145).

It is clear that Manovich (2001:20), Harries (2002:1), Lister *et al.* (2003:9) and Subraman (2005:3) have a common understanding regarding the issue of the changing of old media through the use of computers or new technologies in

their definitions. The change is assumed to be either the use of computers or new technologies in the production process and communication process (distribution or exhibition). Even though there is common understanding on the issue of change, Manovich (2001) and Lister *et al.* (2003) believe that in order to avoid falling into a trap of limiting the definition of new media, principles and concepts should be used as a guide in defining new media. Manovich states that new media should obey the following principles: numerical presentation, automation, variability and cultural transcoding. On the other hand, Lister *et al.* talk about key concepts, namely digitality, interactivity, hypertextuality, dispersal and virtuality. Similarly, Palvik & Dennis (1998) group new media's key concepts into three main groups: trends of technological transformation of human communication, new media qualities and attributes, and computer network concepts. Manovich (2001) and Lister *et al.* (2003) share a similar view that principles or concepts for defining new media should be understood as guidelines.

The identified principles or concepts of new media by Palvik & Dennis (1998), Manovich (2001) and Lister *et al.* (2003) address a similar view of the characteristics commonly attributed to new media. For instance, the five principles of Manovich and the concepts of the use of terminologies of Lister *et al.* are different, but they retain similar meanings in definitions. For example, *digitality* refers to numerical representation, and the instrumental meaning of *interactivity* allows for the automation of many operations. This can be seen when a smart camera automatically follows the action and frames the shots when given a script. Palvik & Dennis (1998), Manovich (2001) and Lister *et al.* (2003) in defining concepts, suggest that the characteristics of the new media are new ways of producing, accessing and exhibiting the established media content through the aid of computers.

With respect to animation, in his writings on *animation and authorship*, Wells (2002:1) explains how animation is informing many aspects of visual culture, such as feature-length films, television and web cartoons. For instance, in an

interactive multimedia and computer game, animation is integrated in several ways i.e. tracking of the mouse cursor on the screen, rollover image or button (Peacock 2002:92). For the purpose of this study, the discussion of how animation relates to new media will be limited to live action films and a brief discussion on interactive media and games, as they are relevant to the study.

The history of motion pictures can be associated with the development of animation, which brought cinema into being. From its origin, cinema was referred to as the art of motion; this can be seen in terms of the early development techniques which relied on hand-painted and hand-drawn images, e.g. the Phenakistoscope. The twentieth century styles of animation and cinema started to diverge; animation (that is, its visual language) was described as more akin to graphics, while cinema was more akin to photography (Manovich 2001:298). Subsequently, in the twenty-first century, we witness the convergence of cinema and animation through the use of computers for communication processes (display) and production processes (techniques). Lister *et al.* (2003:140) suggest that motion computer graphic imagery affected cinema through the technological advancement and spectacular effects of verisimilitude, photorealism and hyperrealism.

(i) *Verisimilitude*

Verisimilitude pertains to 'the appearance of being true or real' (OED 1999:1592). It could also be seen as any believable imitation of the visual appearance of the world and its inhabitants through the eyes of the viewer. In traditional cinematography, the notion of the appearance of being true or real was neglected until the dawn of technological advancements of imagery in visual special effects and computer animation (Lister *et al.* 2003:140). The technological advancements changed live action (cinema) by the use of visual special effects and computer animation and this trend was followed because of the success of CGI-animated features at the box office. The examples of verisimilitude can be viewed in the movie *Tsotsi*, a South African

Oscar-winning feature-length film, in which computer-generated 3D ants appear to crawl over the baby's face. In two other motion pictures, *Shreck 2* (2004) and *Monster Inc* (2001), both feature-length animation films, the hair, fur, clothing and human emotions are as realistic as they would be in real life.

(ii) *Photorealism*

The term *photorealistic* (adjective) pertains to a digitally processed photograph that could not be produced by basic photographic techniques (Lister *et al.* 2003:140). Robins (1996:42) sees digitally processed photographs as “no longer regarded as evidence of anything external to itself”. Robins (1996) further argues that “the relation between the photographic image and the real world is subverted, leaving the entire problematic concept of representation pulverised and destabilising the bond the image has with time, memory or history” (Robins 1996:41). What Robins is referring to is that the representation of aesthetics such as photorealism does not replicate the external reality, but it represents its own kind of reality. Photorealistic techniques are used to recreate shots that conventional cinematography cannot achieve, or to create a fantasy world that has never been seen before by the human eye (Fig.2.3).



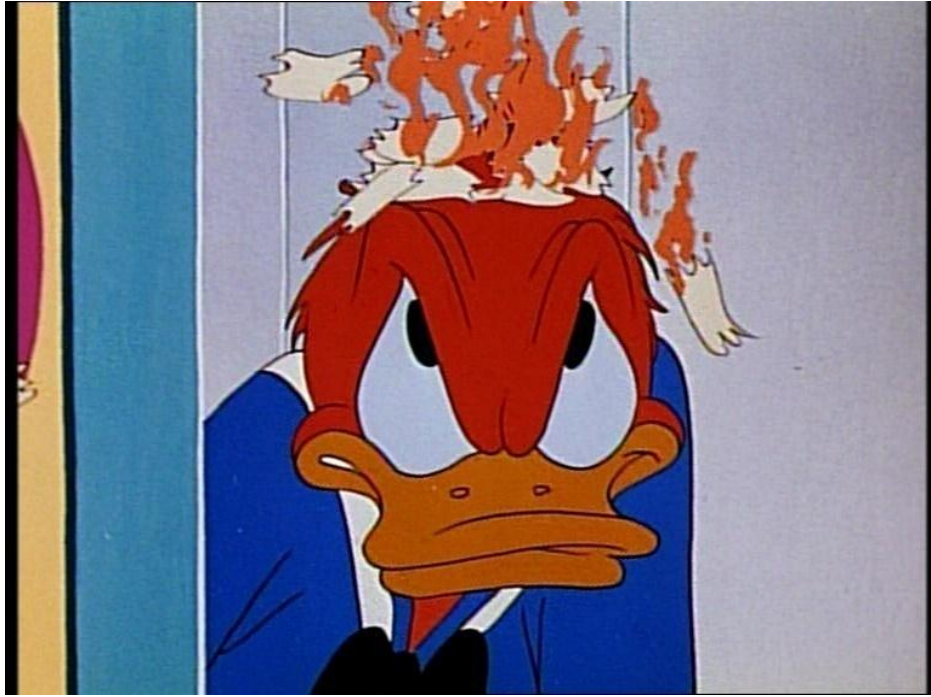
**Figure 2.3:** *The Matrix Revolution* Movie, 2003 (still image). *Computer Graphics World*. December 2003. Vol. 26 no.12.

The shot in Fig. 2.3 was created by computer graphics-generated rain mixed with real rain and by adding the figure of agent Smith. From a spectator point of view, one cannot distinguish between the computer-generated rain and the real rain, or between the computer-generated agent Smith and the real agent Smith. Indeed, such visual effects could not be achieved by traditional cinematography.

### (iii) *Hyperrealism*

According to the OED (1999:699), the term *hyperrealism* relates to a graphic representation that is 'exaggerated in comparison to reality'; in art it is 'extremely realistic in details'. Lister *et al.* (2003:141) claim that the term *hyperrealism* is often confused with *simulation*, as discussed in the writings of Jean Baudrillard (Eco 1983:3-57; Poster 1988:166-183), where it is stated that hyperreality is synonymous with simulation and is characterised by fakes, for example the artefacts in the Ripley's museum. Hyperrealism in this study is discussed within the context of the dominant aesthetic in popular animation, developed by Walt Disney. This animation aesthetic refers to the exaggeration of the forces of the physical world by the characters in an animation medium (Lister *et al.* 2003:143). Disney animation presents its characters and environments as not confined to the physics of the real world; evidence of this can be seen in the use of the principles of animation, such as squash and stretch, anticipation, follow through and exaggeration (Thomas & Johnston 1981:47-65). Walt Disney believed in developing the essence of characters by exaggerating their emotions; for example, if the character is angry, it should be portrayed as being twice as angry (Thomas & Johnston 1981:65) (Fig. 2.4).





**Figure 2.4:** Walt Disney Sweetheart stories, an Adorable Cartoon Collection DVD: *Donald's double trouble*. Snap shot.

In the twenty-first century, computer animation has played an important role by continuing to use conventional principles in the illusion of movement and by the new type of film technique. During this period, the computer animation production process has reached a point where the creation of movement or films could be generated completely by computer, for example in *Toy Story* (1995) (Fig. 3.3). In contrast *with Donald's double trouble*, the hyperrealism in the storytelling of the character still makes use of old ways of representing film but at the same time retains the cartoon feel. Additionally, its aesthetic model is extremely realistic in detail (as it would appear in real life).



**Figure 2.5:** *Toy Story* 3D animated film. 1995. 1995- 2010 Disney/Pixar. Retrieved from <http://www.pixar.com/featurefilms/ts/tale.html>

The hyperrealism in contemporary culture is increasingly virtual, and computer-animated films are combining live action films with animation, as in *Rocky and Bullwinkle*, *Scooby-Doo*, *Garfield*, *Lord of the Rings* and many more. Computer animation plays an important part in achieving a high level of image brilliance and spectacle with digital cinema.

Although animation has contributed in the tradition of live action film-making, according to Bolter and Grusin (1999:147), animation has been remediating live action Hollywood films for decades. Their argument is related to the use of cinematic techniques such as camera angles and editing in animation. Bolter and Grusin (2009:147) further claim that “animated film cannibalizes and refashions everything it touches with a ferocity that is itself mediated and excused precisely because the genre is not serious and is supposed to speak to children”. Here Bolter and Grusin (2009) provide an example of how

animations refashion stories, myths and legends, from Greek mythology to literary classics.

With regard to interactive multimedia, animation contributed in a number of ways and forms. Peacock (2002:92-100) pointed out that animation integrates itself in an interactive multimedia by means of animated objects (e.g. cursor movement, animated buttons), as well as hypertext and virtual worlds. According to Peacock (2002:95) the main contribution that animation makes to interactive media is through “the apparent responsiveness of the system and ... the user’s feeling of agency”. Animated objects in multimedia include changes and movements on the display screen through the use of the icon toolboxes or menu dropdown list. The movements of the menu dropdown list, and icons on toolboxes emphasise the structure and the flow of information and provide visual interest and feedback for the end user (Peacock 2002:96). With regard to hypertext, Peacock (2002:96) explains that animation “contributed to the emergence of new media forms and animation became a defining mode within them”. The contribution of animation in terms of hypertext can be seen in a form of hypermedia. The presentation, compositing and links of static and moving images and sounds, among others, were made possible by the use of animation techniques.

Peacock (2002:100) discusses the contribution of animation in virtual reality by looking at the rendered 3D spaces in games such as *Doom*, *Quake*, *Tomb Raiders* and *Golden Eye*. His focus is not based on the game design theories, but on the concept of change and movement. The contribution of animation in this regard is that the user or viewer is an active participant rather than a viewer of the world, as compared to filmic and television perspective. In a similar view, Bowman (2002:122-130) explores the concept of animation in computer games. Bowman (2002) splits animation into two main categories in the computer games industry, namely programmer-created animation and artist-created animation. Programmer-created animation can be referred to as scripted animation, using basic programming

language scripts or pieces of code. According to Bowman (2002:130), “a script is a series of events defined by a programmer to perform a certain action”. Artist-created animation refers to any form of character animation created by an animator rather than a programmer. Character animation deals with the animated character with believable performance and personality traits. Character performances are achieved by means of rigging 3D computer-generated characters or puppets frame by frame (Bowman 2002:130).

## **2.5 South African animation industry**

There is little written on animation in general and even less that is specific to computer-generated animation in the South African animation industry. South Africa is believed to be the first African country to produce animation (Wright 2005:34). In 1916 Harold Shaw directed an animation film entitled: *The artist's dream*. The only available evidence of the film is a few photographs. Until the 1940s, Alpha Film Productions produced ‘drawtoons’ commercials. The stop-motion animation technique used to create the commercials was similar to the chalk animation by Stuart Blackton in *Humorous phases of funny faces* (1906). The animation technique referred to is a process of drawing an image, photographing it, erasing part of it and then re-drawing it on paper in order to create motion. The technique was also used to produce animated materials for ‘bioscope’ audiences until the introduction of television in the mid-1970s. The evidence of such developments can be seen in a few remaining cells.

Wright (2005:34-35) confirmed that the South African Broadcasting Corporation (SABC) started an animation department using traditional two-dimensional cell animation. In the early 1980s the introduction of computers made the traditional technique obsolete. In the late 1980s, William Kentridge revived the technique used experimentally by Harold Shaw in 1916 in his series of short films (including *Felix in exile* and *Johannesburg*) with new themes. In the mid-1990s animation studios became more active and most of

them survived on commissions for commercials. Trigger Fish, XYZoo animation and Lovebomb animation were among the active animation studios during this period. These animation studios were famous for their clay animation technique (see figure 2.6).



**Figure 2.6:** XYZOO. 2004. XYZOO show reel. Snap shot.

In 2006 animation productions developed from 2D to 3D, or stop-motion animated features to animated TV series. Sunrise Productions produced *African Tale* as their second feature-length film, while Character Matters were also in the production stages of a 60-minute animated film entitled *Zambezia* (see figure 2.7).



**Figure 2.7:** *Zambezia*. n.d. Retrieved from <http://www.triggerfish.co.za/index.html>.



Clockwork Zoo studio was also producing the digital 2D animated television series *URBO: the adventure of Pax Africa* for SABC channel3 (see figure 2.8). The development of the South African animators and visual effects artists was so successful that their work in the movie *Mama Jack* and Oscar-winning *Tsotsi* was not only recognised but was also internationally competitive (2006:4,7). The collaborations of international and national animation studios or post-production companies in animation projects were also strengthened. Morula Pictures of Johannesburg, South Africa and Chocolate Moose Media Inc. of Ottawa Canada collaborated in the production of *Magic Cellar*, a series of twenty 3D animated shorts (2006:7).



**Figure 2.8:** *URBO: the adventure of Pax Africa*. 2006-2008 TV series. Retrieved from <http://clockworkzoo.com/articles/portfolio/urbo>.

In 2009, the collaboration of national and international animation companies continued to be the trend. Clockwork Zoo (Cape Town) collaborated with Xilam Animation Studio (Paris) in an animation service job for the *Mr Baby* TV series for a French channel (2009:25). Character Matters produced *Zoovolution*, a 24-minute pilot for a children's TV series for Web and Circus, a Norwegian gaming studio (2009:25).

The South African government agencies and industry associations realised the growth of the industry and the need for supporting structures. A Department of Trade and Industry report (2005:16) identified the lack of content development skills and technical skills as the major areas of concern in the South African film industry. The Cape Film Commission and Animation SA established interventions, developments and supporting systems (i.e. Animation Industry Development Initiative (AIDI)) in order to address the problem of the skills shortage in the animation industry (2009:7).

## **2.6 Chapter summary**

The medium of animation is characterised by many styles or techniques and it is clear that the definitions of animation are changing with time because of technological developments. Wells and Hardstaff (2008:7) suggested that a workable definition of animation should be drawn up in terms of its creator's objective and the context in which it is produced. Denslow (1997) provided an example related to the practice of giving job titles such as technical directors rather than animators to the people who animate on the computer. The historical origins of both animation and computing can be traced as far back as prehistoric cave paintings and the Salamis tablet believed to be used by Babylonians circa 300 B.C. In the 1980s computers became available for sale to the public and PDI, Cranston-Csuri, and Lucasfilm/Pixar were among the animation studios that led the way in the development of computer animation (Furniss 2007:179). Computer hardware and software such as RenderMan were developed specifically for animation purposes. Subsequently, the use of computers by animators has led to the success of the CGI-animated features (Crawford 2003:110; Darley 2003:82).

It was also observed that animation relates to new media in a number of ways and forms, for example, in the use of computer-generated spectacular effects, such as in verisimilitude and photorealism, in live action films (Lister *et al.* 2003:140). This can also be seen in interactive multimedia such as web and game design through the creation of animated media objects. Peacock

(2002:96) provided examples such as the movement of the cursor, the icon toolboxes or the menu dropdown lists on a GUI. The phrase new *media* can be understood as involving the transformation of the modern media and the development of computers or electronic devices through the use of computers. New media can be seen in use in the production and distribution of information, characterised by interactivity, virtual reality, plurality and digitality (Harries 2002:1; Lister *et al.* 2003:9; Manovich 2001:20 and Subraman 2005:3).

Animation remediates itself in new media by the incorporation of computer use and cinematic techniques (Bolter & Grusin 1999:147), while on the other hand, live action films and interactive media remediate animation in terms of the use of animated media objects or visual effects. In the South African context, the development of animation can be traced back to 1916 (Wright 2005:34). In 1916 Harold Shaw directed an animated film entitled: *The artist's dream*. In the late 1980s William Kentridge produced animated short films, such as *Felix in exile*, and *Johannesburg*. In the mid-1990s animation studios became more active and most of them survived on commissions for commercials. In the mid-2000s the development of South African animators and visual effects was so successful that national and international animation companies collaborated in animation productions (2009:25). As a result, South African government agencies and industry associations began to establish interventions, developments and supporting systems in the animation industry (2009:7).

Based on the definitions and discussions presented in this chapter, it can be said that developments in animation production led to new methods of production and to techniques which are aided by the use of computers. More importantly, these changes revived traditional animation production processes and sited them in new contexts (e.g. digital cinema, game design, interactive design). In chapter 3, critical skills required for entry level animators in computer-generated animation are discussed. The discussion



will be focused on the computer-animation production processes. This will provide a framework within which views of the practitioners in South African companies will be discussed.

## **CHAPTER 3**

### **TECHNICAL SKILLS AND CREATIVE SKILLS IN COMPUTER-GENERATED ANIMATION**

#### **3.1 Introduction**

Chapter two attempted to clarify the meaning of 'animation' and also to demonstrate how the use of computers in production processes has changed the image of animation in terms of new styles and techniques. It was also indicated that the success of animation resulted from the use of computers by the creative talent of individuals. This chapter examines two types of skills which are usually applied in computer animation processes, namely technical and creative skills. The conceptual framework that underpins this chapter is primarily based on Amabile's (1996) three interacting components of the componential model of creativity. This model of creativity suggests that domain-relevant skills and creativity-related skills contribute equally in the production process of a creative product. The definitions of creative and technical skills are discussed and reference is made to various definitions and their underlying theoretical frameworks. The relationships between creative and technical skills in computer animation are also examined. Finally, a discussion is presented on the topic of which of the two sets of skills, technical or creative, is considered more critical for entry level animators.

#### **3.2 Componential model of creativity**

Amabile's (1996) componential framework of creativity includes three major components (see table 3.1), namely Domain-relevant skills, Creativity-relevant skills and Task motivation (Conti *et al.* 1996:385). These three components are considered essential for any production of creative work (De la Harpe 2006:23). Domain-relevant skills refer to basic skills that are acquired by an individual for competence in a specific domain such as writing

or drawing. Such skills include factual knowledge, special skills or technical skills and talent (Conti *et al.* 1996:385; De la Harpe 2006:23). Domain-relevant skills can be understood, in Sternberg, Grigorenko and Singer (2004), as occurring within two types of domain theory, namely the domain-specificity theory and the domain-general theory. The domain-specificity theory refers to the creative skills within a specific discipline which may not be used across other disciplines; this refers specifically to the knowledge acquired over a particular period within a specific discipline. For example, rules or principles of animation may not be applicable in civil engineering or ceramics. On the other hand, the domain-general theory is the opposite of the domain-specificity theory. The domain-general theory pertains to creative skills that can be applied across a number of disciplines; this can be seen in the characteristics of creative abilities of individuals who can function in different disciplines, for example Leonardo Da Vinci, who was an artist and a scientist (Sternberg *et al.* 2004:ix-x).

**Table 3.1:** The three interacting components of Amabile's componential model of creativity (Conti, Coon and Amabile 1996:386)

<p><b>Domain-relevant skills</b> <b><u>Include:</u></b></p> <ul style="list-style-type: none"> <li>- Knowledge about the domain</li> <li>- Technical skills required</li> <li>- Talent</li> </ul> <p><b><u>Depend on:</u></b></p> <ul style="list-style-type: none"> <li>- Innate cognitive abilities</li> <li>- Innate perceptual and motor skills</li> <li>- Formal and informal</li> </ul>	<p><b>Creativity-relevant skills</b> <b><u>Include:</u></b></p> <ul style="list-style-type: none"> <li>- Appropriate cognitive style</li> <li>- Implicit or explicit knowledge of heuristics for generating novel ideas</li> <li>- Conducive work style</li> </ul> <p><b><u>Depends on:</u></b></p> <ul style="list-style-type: none"> <li>- Training</li> <li>- Experience in idea generation</li> <li>- Personality characteristics</li> </ul>	<p><b>Task motivation</b> <b><u>Includes:</u></b></p> <ul style="list-style-type: none"> <li>- Attitudes towards the task</li> <li>- Perceptions of own motivation for undertaking the task</li> </ul> <p><b><u>Depends on:</u></b></p> <ul style="list-style-type: none"> <li>- Internal level of intrinsic motivation toward the task</li> <li>- Presence or absence of salient extrinsic constraints in the social environment</li> <li>- Individual ability to cognitively minimise extrinsic constraints</li> </ul>
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Creativity-relevant skills can be defined as skills that “contribute to creative performance across domains and include cognitive style, working style, and

divergent thinking abilities” (Conti *et al.* 1996:385). De la Harpe (2006: 23) describes such skills as “skill in breaking free of old traditional and fixed sets or standards of performance, adept at generating novel ideas and making associations of seemingly unrelated ideas”. What Conti *et al.* (1996:385) and De la Harpe (2006:23) are referring to can be seen in Boden’s (1994:76) theory of P-creativity and H-creativity. Creativity-relevant skills are skills that contribute towards historical lifetime achievements (H-creativity), such as inventions or the psychological revelation (P-creativity) of a new idea by an individual.

Task motivation involves determinants and related regulative forces in an individual’s approach to a given creative task (Conti *et al.* 1996:385). De la Harpe (2006: 23-24) describes task motivation as “intense interest giving undivided attention to the task, willingness to respond to intuition, feeling self-reliant and being especially resistant to pressure and control of distracting outside factors”. Amabile’s componential framework of creativity suggests that these three components contribute equally to creativity. Additionally, the correlations between these three components will be strongest within the same domain. In an attempt to test these predictions, Conti *et al.* (1996) researched the evidence to support this claim. Conti *et al.* (1996:386) argued that task motivation should remain constant in the same domain. Further domain-relevant skills and creativity-related skills contribute equally in order to achieve a creative product. The study involved five separate activities: writing two short stories and three art activities. The result showed a positive correlation between Amabile’s three components, demonstrating that they are stronger within the same domain.

### **3.3 Defining creative skills**

From a psychological standpoint, the word *creative* is used to describe a number of things at an everyday level (Hayes & Mellon 1990:1), such as the ability to do something constructively. Furthermore, according to Taylor (1988:118), creativity can be defined in more than 60 ways in psychological

literature. There are also many other theories and myths explaining or associated with creativity and many of these are from Eastern sources. From a purely Western perspective Rzadkiewicz (2009:1-4) identifies the following theories: the psychoanalytical theory of creativity, the mental illness theory of creativity, Eysenck's theory of psychoticism and the addiction theory of creativity. De la Harpe (2007:8-10) refers to the most popular myths about creativity: creativity results mainly from inspiration, creativity is mainly a right-brain activity, creativity is linked to 'craziness' and one cannot learn to be creative. The abovementioned views suggest how complex it is to define 'creativity'. To attempt to clarify the meaning of this term, however, it was decided to answer the following simple questions: What is creativity? What makes something creative?

### **3.3.1 What is creativity?**

In general terms creativity refers to "a process which involves the use of original ideas in order to create something" (OED1999:334). Taylor (1988:118-119) describes creativity as the ability or the power of mental processes to create or produce original ideas, expressive imagination or qualities of products. But Candy and Edmonds (1999:3) argue that these definitions could lead to misinterpretation of the word *creativity*. Both Candy and Edmonds (1999:3) and Russ (2007:2) believe that the definition of creativity should not only involve the ability to convert original ideas into 'something', but into a product that must be judged and accepted by experts in terms of external standards. Bilton (2007:3) points out two main characteristics of creativity in management literature: "[C]reativity is all about novelty or difference—a deviation from conventional tools and perspectives" and "it requires that creative individuals be given the freedom to express their individual talent or vision". Bilton (2007) further argues that these aspects are too much centred on the Western philosophical tradition. Despite this he believes that psychological definitions of creativity should also be considered on two levels, namely on the level of making something new and on the level of problem solving.

What Bilton (2007:20) is referring to is also evident in Boden's (1994:76) theory of P-creativity and H-creativity and in Maslow's (1968) primary and secondary creativity. P-creativity pertains to the psychological revelation of a new idea by an individual, even though the same idea has been explored by other people, while H-creativity means a historical achievement which no one else has accomplished. Weisberg (1992:1) mentions a few examples of such historical lifetime achievements, for example, Picasso's *Les Femmes d'Alger* painting. Maslow's (1968) primary creativity refers to intuitive processes, and secondary creativity can be seen as a skilled and knowledgeable creative decision taken to solve a particular problem. Bilton's (2007:20) psychological definitions of creativity, namely making something new and problem solving, Boden's (1994:76) theories of P-creativity and H-creativity and Maslow's (1968) primary and secondary creativity indicate some overlaps. P-creativity as a primary creativity can be developed into secondary creativity, which can easily be developed as an H-creativity. The definitions of creativity have so far suggested one side of an individual specialist. Bilton (2007:45) proposed a psychological model of creativity as a system (institution) in which creative work is taking place, rather than individual creativity. Subsequently, Bilton's (2007) proposition introduces another dimension in the definition of creativity: the sociological model of creativity, which involves a team of people from different fields with different skills working together towards a creative product.

Csikszentmihalyi (1996) tends to differ from both definitions of creativity, whether related to individual or team specialists. Csikszentmihalyi (1996:23) finds them limiting and believes that "creativity does not happen inside people's heads, but in the interaction between a person's thoughts and a socio-cultural context". He further argues that in order for an idea to make an impact it must be accepted and understood by experts in the field and cultural domain in which it belongs (1996:27). Csikszentmihalyi (1996:28) defines creativity as "any act, idea or product that changes an existing domain, or that transforms an existing domain into a new one".

Csikszentmihalyi (1996) is criticised for forgetting that it requires the creative individual to judge his/her own work (Shneiderman 2007:25). For the purpose of this study creativity can be referred to as the ability to generate novel ideas through any technical limitations in an individual production process or in a team effort.

### **3.3.1 What makes something creative?**

The question has often been asked: What makes something creative? It is difficult to prove scientifically whether something is creative or not. According to Pricken (2004:15), in his interviews with a number of international directors and animators/motion graphic designers, among others, few of them can tell what creativity is but they can tell when they see it. Usually criteria to judge whether something is creative or not, involve a number of factors, including social judgements (Hayes & Mellon 1990:1) and the standards of a particular discipline (Russ 2007:1). Despite the differences in social judgement and the criteria of disciplines, Hayes and Mellon (1990:1) argue that the core evaluation of any 'creative' product requires three creative determinants: it should be original/novel, it should be valuable/interesting, and it should involve the mind of the creator. The question is whether or not the product should obey three creative determinants in order to be considered creative. Russ (2007:2) highlighted Torrence's (1988) claims of newness as a major criterion; secondly, the quality of the product should be good. Saunders (2006:1) points out that "creative judgements are identified by a creative individual and the title [is] awarded by society to honour the importance of creative works or creative individuals in music, visual arts and architecture". The creative individuals referred to by Saunders (2006) should demonstrate two kinds of creative outcomes, namely exceptional and outstanding creative outcomes, identified by Candy and Edmonds (1999:4). Exceptional creative outcomes are usually evaluated by peer groups consisting of domain experts and outstanding creative outcomes are those that are valued both inside and outside the specialist community (Csikszentmihalyi 1996:27).

### 3.4 Defining technical skills

Mitcham (1994:64) points out that “technical terminology has itself become a kind of Esperanto of the emerging world techno-culture”. The term *technical* in general refers to special knowledge or technique in art or the operation of machines in an industrial society (OED 1999:1470). Mitcham (1994:235) concurs with this definition by describing the term *technical* as “systematic knowledge of the industrial arts, with technique being the means of practical application”. According to Feenberg (1991:27), the term refers to a process in which skills can be learned by means of either training or practice.

The abovementioned definitions emphasise that *technique* and *technology* are the main descriptive words in defining *technical*. According to Mitcham (1994:235), the word *technology* by definition refers to technique. Herschbach (1995:1) explains that technology relates to the process of acquiring technical skills and the development of a particular object. He further explains that the technique refers to procedures and methods used by an individual to produce an object. These procedures can be applied, for example, by means of operating a camera or texturing 3D CGI-generated character.

The abovementioned procedures or methods can be viewed from the perspective of more than one type of learning process, depending on the field of practice. For the purpose of this study, psychomotor skills (Krathwohl 2002:212) are used as an example in order to explain the abovementioned procedures. Herschbach (1995:4) describes three categories of technological knowledge identified by Vincenti (1984:575), namely descriptive, prescriptive and tacit, which can be associated with the psychomotor domain in terms of the hierarchical learning process from a lower level to a high level of complexity.

Descriptive knowledge, according to Herschbach (1995:4), refers to “the framework within which the informed person works, such as material



properties, technical information, and tool characteristics". Descriptive knowledge can also be associated with rules of skills or principles (Mitcham 1994:25). For example, manuals or booklets on principles of design, principles of editing and principles of animation describe things as they are in the form of guidelines and rules.

Prescriptive knowledge refers to the "result of successive efforts to achieve greater effectiveness" (Herschbach 1995:4). In simpler terms it means hands-on training aimed at improving procedures or to be competent following tutorials or trial-and-error and testing.

Tacit knowledge is knowledge that is passed on from one experienced person to another. Tacit knowledge is usually learned through internships and work experience, e.g. aircraft production, electronics and film making (Herschbach 1995:6).

These three categories of technological knowledge can be measured by a skills-acquisition process identified by Mitcham (1994:195) as: beginner's level, competency, advanced level, proficiency and expertise. The beginner's level can be considered as descriptive knowledge because its explanatory theoretical framework has not yet been developed, while the competency level can be seen as prescriptive knowledge, and the advanced, proficiency and expertise levels as tacit knowledge. Therefore 'technical skills', in the context of this study, should be understood as any advanced special knowledge and the application of tools (computers) related to a specific discipline (Concise Oxford English Dictionary (OED) 1999:1470; Feenberg 1991:27; Herschbach 1995:1; Mitcham 1994:235).

### **3.5 How technical skills relate to creative skills in computer-generated animation**

There are three phases in the production of an animated film: creative input, production and the management and technical phase (Hayward 1971:8). The

phase of creative input involves ideas, research, storyboarding, script creation, and design, while production and management includes such aspects as costing, scheduling, charting and fund raising. The technical stage includes animation, shooting, sound editing and visual editing. Musburger and Kindem (2009:33-36), describe the production process of film and animation in three production phases: pre-production, production and post-production. The pre-production phase deals with aspects similar to those described in Hayward's (1971) creative stage of animation. Production and post-production phases also deal with animation, shooting, sound editing and visual editing. According to Wells (2002:19), Computer Graphics Interface has changed this to a certain extent. Pricken (2004:4) further emphasises that "the only thing that has not changed is the way that ideas are developed: by instinct, from creatively gifted minds". This view is also shared by John Lasseter (an animation director/executive producer at DreamWorks animation studios) in his interviews with Pricken (2004:14), when he says that "we are storytellers who happen to use computers. Story and character come first and that is what drives everything we do". The major challenge animators are faced with is that they are required to acquire high levels of technical skills in the operation and application of specific animation computer software (Furniss 2007:176). More importantly, Hume and Sizer-Coy (2009:20) have stated that it is crucial for people entering the animation industry to command high levels of technical skill in 3D computer animation. But Pricken (2004:14) is quick to remind us that, while the possibilities in computer animation are endless, we should not forget that creativity is important. Conti *et al.* (1996:385) argue that domain-relevant skills and creativity-relevant skills contribute equally in the production process of a creative product.

In an attempt to discuss the relationship between technical skills and creative skills, it is necessary to understand the creative and technical animation production processes. In this study, Csikszentmihalyi's (1996:79) five steps of the creative process and De la Harpe's (2007:16-18) five phases or stages

of the creative process were adopted in order to explain the creative and technical animation production process. Csikszentmihalyi (1996) describes the five steps of the creative process: period of preparation, period of incubation, insight, evaluation and elaboration. De la Harpe (2007) also describes the creative process in five phases or stages: the preparation phase, the ideation phase, the selection phase, the production phase and the evaluation phase. Csikszentmihalyi's five steps of the creative process and De la Harpe's five phases or stages use terminologies that are different but they retain similar meanings in their descriptions. Both Csikszentmihalyi (1996) and De la Harpe (2007) utilise these stages of the creative process as guidelines rather than rules, suggesting that creativity should not be approached in a linear fashion. Additionally such a creative process can be applied in most fields, including the visual arts and science, among others. With a closer look at the animation production processes, these five phases are seen to be applicable in different ways. In order to contextualise these five phases, a documentary of the making of the animated feature film *Finding Nemo* (2003) directed by Andrew Stanton will be used. For the purpose of this study, De la Harpe's five phases of creative process will be discussed as a primary reference.

### **3.5.1 Five phases of the creative process**

#### **3.5.1.1 The preparation phase**

This stage entails information-gathering, goal-setting and the setting of problematic challenges (Csikszentmihalyi 1996:79; De la Harpe 2007:22-27; Russ 2007:3). During this stage of the visual communication design, it helps both parties (client and artist) to understand and establish an overall direction for the production. De la Harpe (2007:24) explains that the setting of goals at this stage is determined by a number of factors, including the budget and the target market, among others. This exercise or procedure will help an artist to be clear about the specific requirements for the project. Additionally, in order to achieve such project requirements, more information dealing with a particular concept or theme should be investigated. This will help in well-

informed decisions being taken in the later stages. Gathered information can be recorded in the form of a storyboard or sketch book for later use.

#### **3.5.1.2 Ideation**

According to De la Harpe (2007:29), “original ideas are probably the most wanted items in the design industry”. Therefore it is crucial during this stage to combine both structured and unstructured techniques of generating ideas in order to survive in this industry. It is suggested that at this stage in particular, one should avoid being judgemental and critical of ideas. The process could involve brainstorming. De la Harpe (2007:39-95) discusses the following nine creativity techniques:

- The big six technique – uses who, where, what, when, why and how questions.
- The random technique – refers to randomly selected words, images and objects in order to allow for an uncontrolled thinking style.
- Mind-mapping technique – pertains to writing key concepts, words, etc. linked by means of lines to form branches.
- The visual thinking technique – is a process of replacing words or text with drawn sketches.
- The trigger technique – can be described as a list of triggers that include replacing or combining shapes and images.
- The metaphor technique – conveys messages in the form of a slogan or punch line.
- The five senses technique – refers to the cross-connect technique and incubation (creative pause).

These techniques help to generate ideas rather than solutions during the creative process.

#### **3.5.1.3 The selection phase**

This stage involves selecting the best ideas generated. The methods and procedures to select top ideas include the criteria matrix and parallel

development. Both methods can be applied sequentially or separately in order to select relevant ideas according to the project-specific requirements (De la Harpe 2007:104-111).

#### **3.5.1.4 The production phase**

During this stage selected ideas are developed into two stages, namely the drafting and finalising stages. The drafting stage is mainly used to develop the selected ideas effectively. In the finalising stage the creative product is polished and the whole creative process can be reflected upon in order to align it with the goals set from the beginning of the process (De la Harpe 2007:112-114).

#### **3.5.1.5 The evaluation phase**

The aim of this stage is to evaluate the success or failure of design solutions used during the creative process. If the product is not good enough it can be reworked. According to Russ (2007:3), critical and logical thinking should be dominant at this stage, because it provides opportunities for improvement of the design work.

In line with the above descriptions of five creativity phases, animation production processes can be classified under Hayward's (1971) creative stages or Musburger and Kindem's (2009) pre-production stages. However, in animation, all the creative developments, evaluations and challenges are dealt with before the production or post-production can take place. In addition, the production phase of the creative process can be in the form of technical, performance or aesthetic tests. Scripts or concepts cannot be finalised until technical challenges of production are dealt with, and vice versa. This can be seen in the documentary of the making of *Finding Nemo* (2003). During the production of this film much of the time was allocated to the development of the aspects of the story. According to Sullivan *et al.* (2008:61), the story in animation is 'king'. Without a story there will be no engaging animated film. In this film the screen play was written by Andrew

Stanton, the director. Other team members thought that the whole process would work out more smoothly because the script was written by the director. However, the challenge was that when the script was translated into a storyboard, they had to rewrite and develop the story to suit the visual story. Bob Peterson, the co-writer, also pointed out that it is important to sort the story out before it gets animated. Andrew Stanton also admitted that a good portion of the rewriting process was not done by the screenwriter but by a group of story department personnel. The rewriting process is done using drawn story panels, which are arranged and assembled in a story reel format (basic animated storyboard with sound). The story department personnel spent a great deal of time working on the story reel trying to create the best solid entertaining template for the movie. Ronnie del Carmer, the story supervisor, pointed out his challenge: "Even though I have done this lots of times, it never fails to bring me to that time...I do not want to do that sequence one more time." (Stanton 2003).

The research for the story's supporting elements, i.e. visualisation, styling, and characterisation, was undertaken in order to translate sketches and words into a believable animated world. According to John Lasseter, the executive producer, research is the key to any animation production and one cannot make a movie without having first-hand experience of the world in which you are working. As an executive producer he facilitated this understanding by arranging that all team members were trained to dive under water in order to experience that world first hand. Ricky Nierva, the Art Director for characters went on numerous field trips doing research as well in order to familiarise himself with the underwater world. The research played an important role in art direction by providing the production designer, Ralph Eggleston, with many ideas for generating key shots in scenes with regard to the direction for lighting such scenes. In the technical department, according to Oren Jacob, supervising technical director, tests were done with the guidance of the director. Early tests did not work out and the director requested them to mimic real live action footages of the world above water

and below water. Technical teams further tried to make shots appear to be seen through the eyes of the underwater diver and tested elements that would be critical to creating realistic shots underwater of such aspects of the underwater world as the vegetation and the way in which light beams are cast.

In terms of the animation department, during the pre-production, Adam Summers, Professor of Physiology, presented lectures on how a fish moves and insisted that they (the animators) understood and absorbed his scientific input. Dylan Brown, the supervising animator, talked about the challenges for the animators with the knowledge of the principles of animation and techniques used in almost every animated film since *Toy Story 1*, however when it came to animating fish, they realised that this was a completely different language. Brown also pointed out that it would take two months of tremendous effort to adapt principles of animation in order to animate fish accurately.

It is clear that the medium of animation involves or combines many disciplines such as sound and narrative art, all with the aim of telling a story. This is made clear in the documentary of the making of *Finding Nemo*. Therefore, the pre-production phases of creativity in animation can be experienced in different ways and at different levels. For example, during the story development for the animated film *Finding Nemo*, the development of the story went through the five stages of the creative process of Csikszentmihalyi (1996) and De la Harpe (2007). The same applied to the visualisation and styling. All the departments in the animation production test, whether they involve technology, performance or aesthetics, should be able to amplify a narrative or a story. As stated previously, the preparation stage of a creative process involves information-gathering, goal-setting and the setting of problematic challenges. In his interviews John Lasseter, the executive producer, indicated how important it is for the animation production team to undertake research. The presentation of lectures for the animators

also emphasised the importance of information-gathering. The Ideation stage of a creative process involves techniques such as brainstorming. A case in point was where Andrew Stanton talks about the screenplay writer collaborating with the story department to make the story visually appealing. The animation pre-production pipeline goes through the stages of ideation, selection and evaluation and these processes are tested during the production phase of creativity in the forms of storyboard, character designs, background designs and animated story reel, or animatics. According to Wells and Hardstaff (2008:148-149), creativity operates at all stages of the animation production process and this is evident in the documentary of the film *Finding Nemo* (2003). It also became clear that the three stages of the animation production process involved Amabile's (1996) creativity-related skills and domain-related skills. With the outlining of the creative and technical production processes for animation, the context has now been set for its creation. Under the next heading, the contexts in which animation can be made are discussed.

### **3.6. Contexts in which animation can be made**

According to Wells and Hardstaff (2008:48), animation can be made through many working contexts, from single-person, back-bedroom studios to major production houses. Individual and collaborative computer animation projects can be made in the following types of animation production outlined by Kerlow (2009:60-62):

- Feature length film (90 minutes)
- An experimental animation short (4 minutes)
- A visual effects shot for a live action sequence (10 minutes)
- Commercials (15 seconds)
- Animated series for TV/internet (15 minutes for TV and 2 minutes for internet)
- Game platform (300 moves)

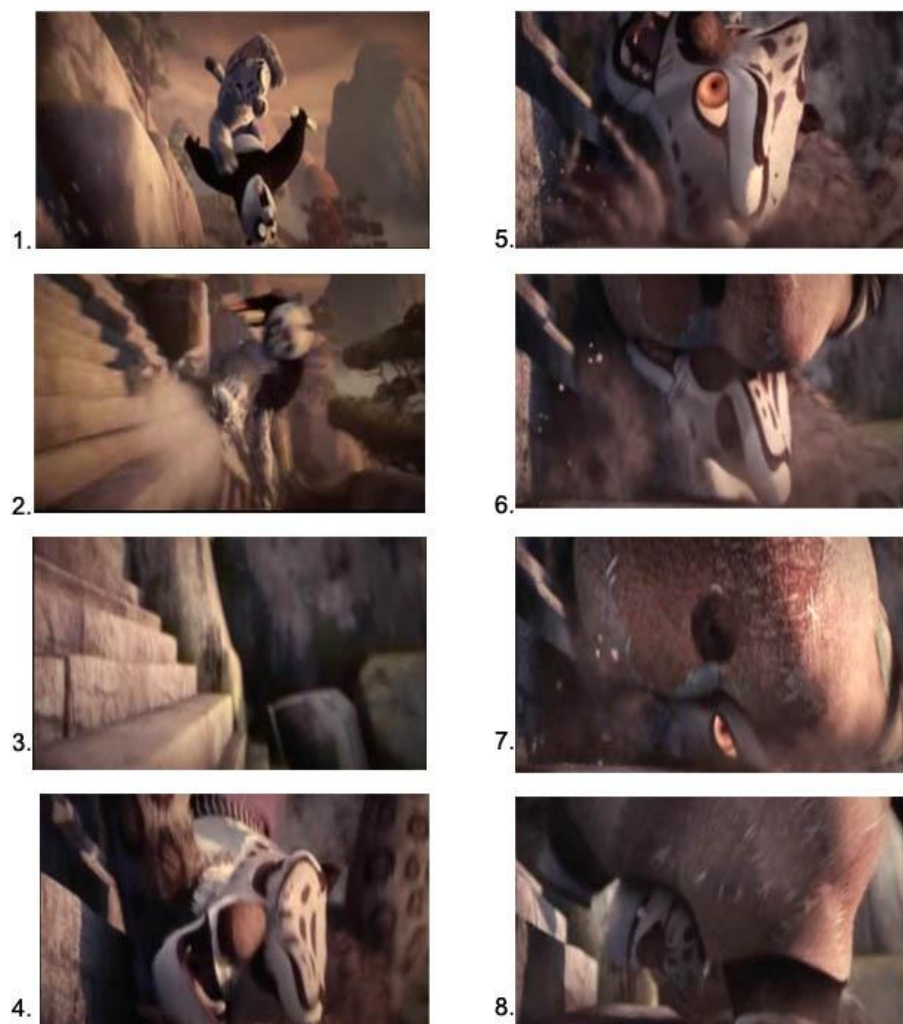


The above mentioned types of production are usually a team effort and the team includes creative and technical personnel. One of the examples of such team members can be seen in Kerlow's (2009:66) list of a TV commercial production team: (a) Creative team: Creative director, Art director, Copy writer, Producer, Account executive and Animation director, (b) Production team: Animation supervisor, Senior/Junior animators, Technical directors (modelling, rigging, lighting, rendering, rotoscoping artist/compositor), Producer, Production manager and Technical assistant. In company collaboration projects, the creative team can be represented by either a design studio or a communications company or an advertising agency (Kerlow 2009:70). In this context, the role of the animation studio or production house is to animate scripts or creative briefs as required by the design studio or advertising agency. Subsequently, irrespective of the type of the animation production "the work of animators involves the visual interpretation of a story and its character. Animators translate the personality of characters into facial expressions, gestures and motions" (Kerlow 2009:49). This can be achieved by the use of twelve traditional principles of animation developed by Walt Disney studios in the 1930s (Thomas & Johnston 1981) and six new principles (Kerlow 2009:311-317).

#### **(i) Twelve traditional principles of animation**

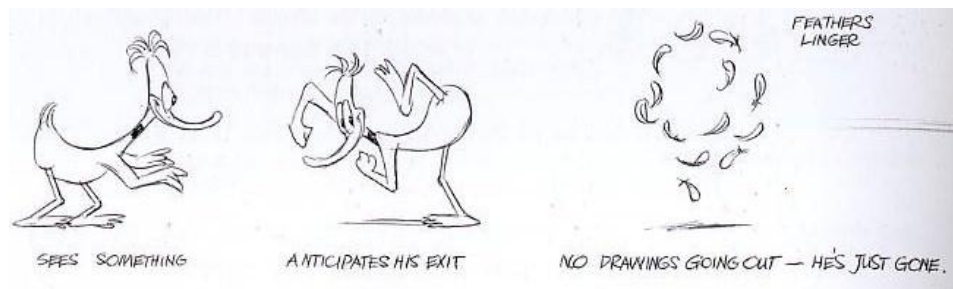
- **Squash and stretch** –These pertain to the deformation of animated objects or characters in terms of shape and form. Williams (2001:39) used the bouncing ball to describe squash and stretch as follows "...that is, the ball elongates as it falls, flattens on impact with the ground and then returns to its normal shape in the slower part of its arc". This principle is usually used to distinguish different types of materials and the sense of believability within the animated environment in terms of weight, surface, softness or hardness. In appropriating Williams' (2001) bouncing ball example, a soft bouncing ball will squash more as compared to a hardball. Such effects amplify the believability of the impact and the type of the object. According to

Kerlow (2009:305), squash and stretch can also be used to illustrate the impact and the comedic effect of an animated object or character. This is mainly achieved with the exaggerated deformation of objects or characters. A good example can be seen in the movie *Kung fu Panda* (2004) in the fighting scene between Po and Tai lung. Both Po and Tai lung fall down the staircase; in the process Po sits over Tai lung's head and the technique of squash and stretch is exaggerated here in order to create that comedic effect Kerlow (2009) is referring to (see figure 3.1).



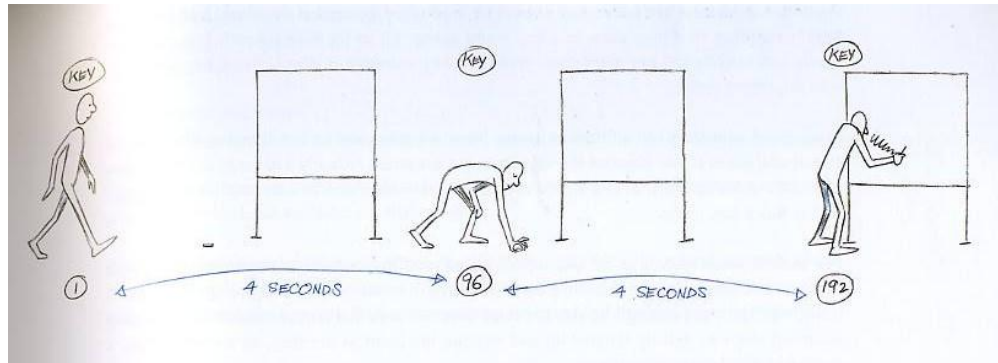
**Figure 3.1:** An example of principles of animation: Squash and stretch. *Kung Fu Panda* 2008. A DreamWorks animation production: Snap shot.

- **Anticipation** – This refers to steps taken by the animation character before an action or a performance happens. Anticipation in animation is usually used to emphasise a number of things through the actions of a character. One of the significant uses of anticipation in animation is to prepare and suspend the audience before the action happens (Williams 2001:273; Patmore 2003:85; Lord & Sibley 2004:140; Georgenes 2010:178). Williams (2001:274) quotes the great French mime, Marcel Marceau in explaining anticipation: “Use big anticipation, because it communicates what is going to happen. The audience sees what is going to happen – they see the anticipation and so they anticipate it with us. They go with us”. In live action, film anticipation is also used effectively in horror films. According to Kerlow (2009:307), “Horror films take us on emotional rollercoaster by switching back and forth between lots of anticipation to a total surprise and invisible anticipation”. In animation there are two types of anticipation, namely surprise anticipation and invisible anticipation (Williams 2001:280-283). Surprise anticipation is when the character prepares for a particular action so that the audience will predict the action that should happen next, only to find that the action is not what they expected. Invisible anticipation is a subtle action that is not visible but it can be felt. The reason for that is that normally it is a quick action. The most used example in classic animation is when the character is about to run, he or she will face in the opposite direction in which he or she is going to run (see figure 3.2).



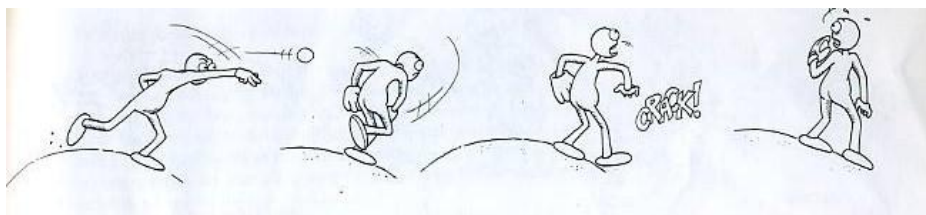
**Figure 3.2:** An example of principles of animation: Anticipation. Source (Williams 2001).

- **Staging** – Patmore (2003:85) describes staging as “related to the way the film as a whole is shot, considering angles, framing and scene length”. In a similar view Kerlow (2009:306) describes staging as *mise-en-scène*. This means that staging is about the overall set-up of a shot in a scene i.e. environment or background, props, lighting and the positioning of the character, in order to amplify the character performance.
- **Pose-to-pose and straight-ahead action** – These are two ways to animate (Williams 2001:61-63; Ptamore 2003:85; Kerlow 2009:307). Straight-ahead action refers to a natural way of animating that starts from the beginning of the action to the end of action without using key poses. According to Williams (2001:61), the advantage of straight-ahead action is that the animator can achieve a natural flow of fluid and spontaneous actions. A basic example of animating straight ahead can be seen in stop-motion and 3D computer animation. In these styles of animation one cannot create poses to guide the action, but can only use an onion skinning technique to see the previous animated poses in order to guide the way forward. Pose-to-pose is a technique used in classic animation to guide the character’s actions by means of drawing the main key poses of the action, (see figure 3.3). After the key frames are drawn, breakdowns and follow-through frames are added or drawn in between key frames order to create the illusion of movement (Williams 2001:62).



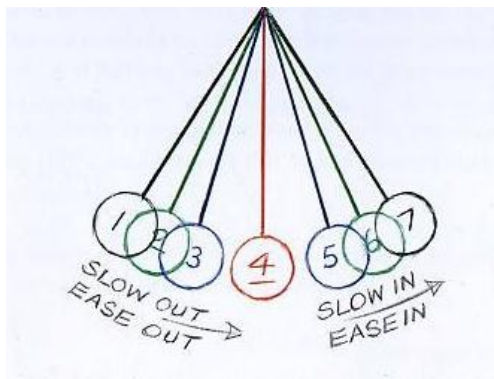
**Figure 3.3:** An example of principles of animation: Pose-to-pose. Source (Williams 2001).

- **Follow-through and overlapping action** – These two techniques are used to amplify actions of animated characters. Follow-through, according to Patmore (2003:85), is an opposite of the anticipation principle. This means that follow-through takes place immediately after the action has happened, whereas anticipation happens prior to the action. A good example can be seen when a character is walking fast and suddenly stops: things like hair, capes and arms remain in motion after the main body has stopped. From a different perspective Kerlow (2009:307) describes follow-through in terms of the reactions of a character after an action has happened, rather than in motion terms (see figure 3.4). Overlapping action refers to the multiple results of follow-through actions that affect the character's movement (Kerlow 2009:307), while on the other hand, Patmore sees it as another form of anticipation for the next action.



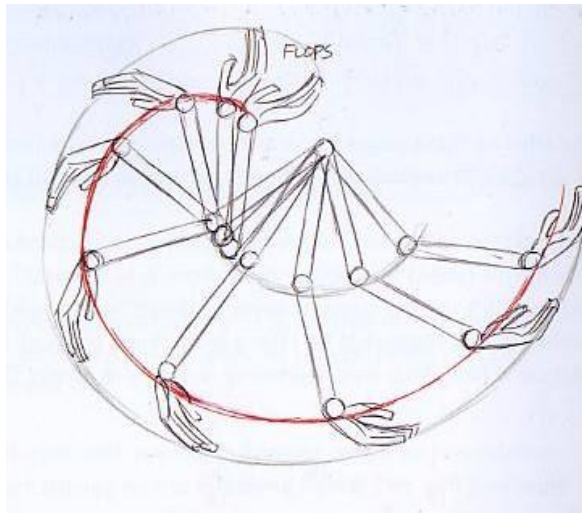
**Figure 3.4:** An example of principles of animation: Follow-through. Source (Kerlow 2009).

- **Slow-in and slow-out** – This could also be referred to as easing in and easing out (Williams 2001:50). In addition, Williams (2001) explains how his colleague Ken Harris (animator) preferred to call slow-in and slow-out a “cushioning”. In simple terms, slow-in and slow-out deals with the timing of an action or movement of a character by using more frames at the beginning and at the end (Patmore 2003:85; Kerlow 2009:307) (See figure 3.5).



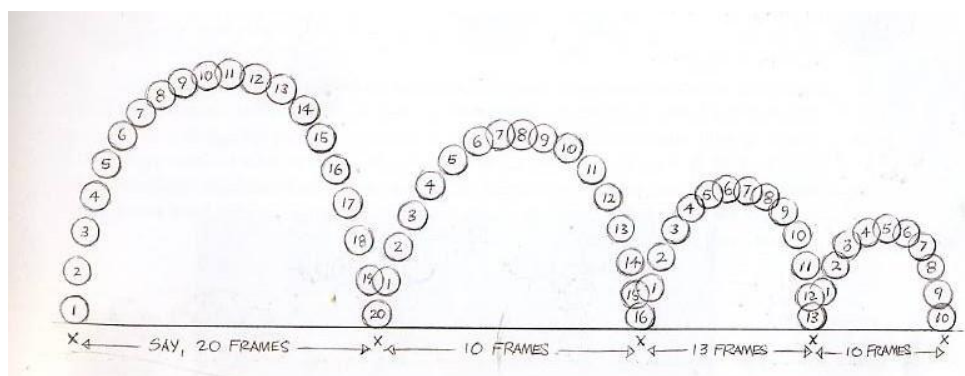
**Figure 3.5:** An example of principles of animation: slow-out and slow-in. Source (Williams 2001).

- **Arc motion** – This refers to the arc-shaped movement of two-legged or four-legged animals or creatures (Patmore 2003:85; Kerlow 2009:307). This technique is used to create character actions or movements in a circular movement, because it is believed that all living creatures’ body parts are connected and rotate around a fixed pivot point (Patmore 2003:85). In addition, Williams (2001:90) also emphasises the point that most actions follow the arc motion. Arcs are used mainly to achieve continuous flow of movement. Williams (2001) uses a swinging hand as an example. “The arm swing, the wrist is leading the arc and the hand drags” (see figure 3.6) (Williams 2001:91).



**Figure 3.6:** An example of principles of animation: Arc motion. Source (Williams 2001).

- **Secondary action** – This pertains to the movement that takes place at the same time as the main movement of the body, for example, the movement of the eyes, turning the head or opening a hand while the character is walking (Patmore 2003:85; Kerlow 2009:309).
- **Timing** – According to Kerlow (2009:309), timing is “both precise moments at which the character moves or acts and the amount of time that he/she spends on the action”. Williams (2001:37) explains the meaning of timing in animation by using a simple bouncing ball (see figure 3.7). The moment of impact of the ball hitting the ground, as indicated on figure 3.7, is referred as timing.



**Figure 3.7:** An example of principles of animation: Timing. Source (Williams 2001).



- Kerlow (2009) further indicated that timing can be used to show the emotional state of the character, such as waiting, interrupting, pausing or thinking. It becomes evident that timing can be seen in two ways namely, technical timing and timing of response. Technical timing can be seen in Williams' (2001) example of the bouncing ball, which illustrates how many frames are required for the ball to hit the ground and to bounce. With regard to timing of responses, this is basically about the time the character spends in a particular emotional state or responding to an event or situation.
- **Exaggeration** – This is a technique used to amplify an event in a story to a hyper-extreme to create a comedic effect in an animated sequence. Exaggeration in animation films can be experienced in more than one way for example, in actions such as speed: animation characters are usually associated with hyper-speed when running; in emotions such as crying: the most used example of the animation character crying is the exaggeration of tears. Tears of a crying character would come out like tap water or waterfalls. The exaggeration can be achieved by using animation principles such as squash and stretch and timing (Patmore 2003:85; Kerlow 2009:309).
- **Solid drawing**– Kerlow (2009:310) refers to “the clear delineation of shape that is necessary to bring animated characters to life”. In 2D drawn animation clear delineation can be seen in terms of the quality of drawing in the form of lines, shape and colour. In 3D-computer animation, solid drawing can be associated with solid modelling and rigging. All these help to define the character traits and the performance. Without a proper rig an animator will not have adequate controls to animate.
- **Character appeal** – This can be seen as the visual appearance of the animated character in terms of whether the audience finds it likeable or not. Character appeal makes it easy for the audience to connect emotionally with the character (Kerlow 2009:310). A good character



design should always have an interesting personality and be attractive in order to connect with the audience.

## **(ii) Six new principles**

Twelve principles were developed based mainly on 2D-animation, which at one time dominated the field of animation. In recent years other styles or techniques were developed and animators were faced with new challenges which the twelve traditional principles could not address adequately, including computer animation, hand-held cameras, non-linear editing and compositing, among others. As a result Kerlow (2009:311) proposes the following new additional principles for computer animation:

- **Limited animation** – This refers to the animation style which is made with inadequate resources, e.g. limited time with regard to production cycle and budget. Limited animation was developed to produce animation with less fluent movement as compared to main stream animation (Disney animation cartoon style). There are two major examples of limited animation, namely Japanese Anime and American TV animated series. Limited animation can be achieved or seen in terms of such aspects as less animation of facial expressions, extreme perspectives, looped characters and background animation, and trails of lines to suggest speed (Kerlow 2009:312).
- **Cinematography and editing** – In Kerlow's (2009) terminologies computer animation offers a number of possibilities of cinematic and editing techniques in storytelling. These possibilities include easy controls of camera movements and lighting techniques, while on the other hand, editing allows for possibilities in rearranging image sequence prior to the post-production phase. Both cinematography and editing can be applied on one computer station.
- **Facial animation** – The development of computer animation provided animators with more facial control tools to create believable facial expressions than any other animation technique (Kerlow 2009:312). Computer animation facial controls help to define the styling of the

character and the personality of the character. According to Kerlow (2009:314), developing facial expressions is as important as developing walk cycles, and techniques or methods in 2D traditional animation. Facial expressions can be developed and fine-tuned in terms of muscle systems, bones, motion capture, morph targets or blend shapes.

- **Visual styling** – This can mean a number of things in computer animation, including rendering in a realistic way or new visual aesthetics. Different innovative rendering techniques can be used to create realistic, surreal, futuristic and fantasy worlds or environments that support the story line.
- **Motion blending**–This refers to the combination of multiple animation techniques into single motion. This can be seen in films that mix cartoon animation style, live action captured motion, rotoscoping and performance capture. A good example can be seen in terms of the performance of the main antagonist, Davy Jones, in the movie *Pirates of the Caribbean*(2005). Multiple animation techniques were used to bring the character Davy to life, such as key frame animation, motion capture and motion dynamics. (Kerlow 2009: 313, 314 & 369).
- **User-controlled animation** – This refers to a new type of animation which has resulted from a combination of narrative animation and games (Kerlow 2009:317).

It is evident that the context in which animation can be made has presented new challenges for animators in animation production with regard to new forms of animation and new principles. In order for the animators to become competent, they need to up-skill or acquire new skills, so that they can operate within this complex and complicated environment (Furniss 2007:176).

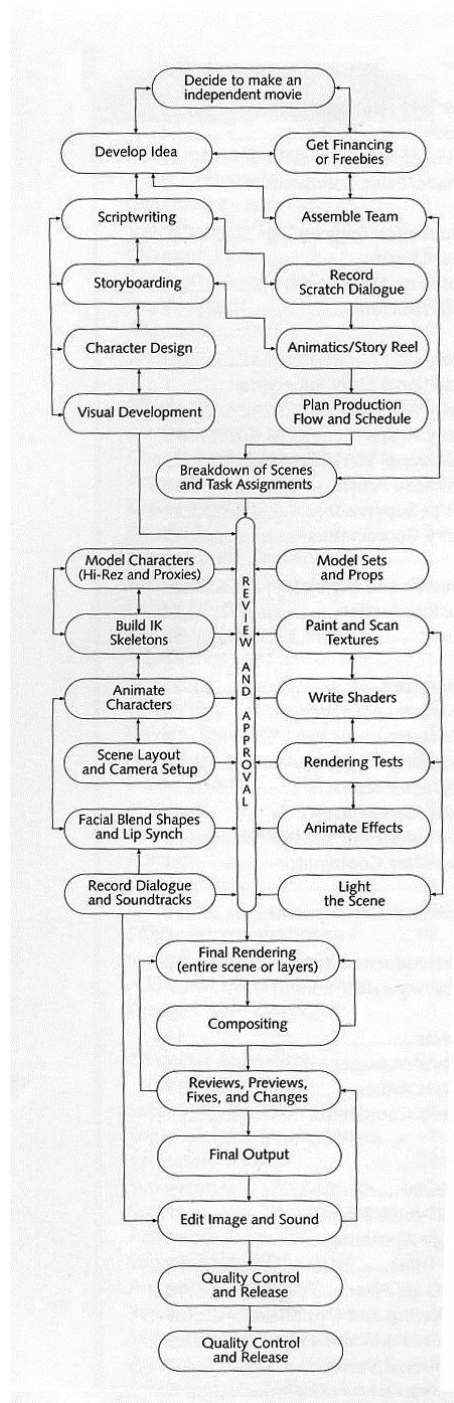
### **3.7 Technical skills and creative skills: which are considered more critical?**

There are number of variables within different contexts which can be used to determine which skills - technical skills or creative skills – are more important in animation. For example, Bilton (2007:27) pointed out that big companies sometimes opt to enter into partnerships with other specialised companies, but such practice is not the order of the day in smaller companies. In smaller companies, for example, individuals are expected to play multiple roles because resources are limited. Sometimes an individual in a smaller company can run a project from conceptualisation to the completion of the project on his or her own (Bilton 2007:27). The nature of animation production is project-based and it involves a combination of specialists in different disciplines. The formulation of the creative process or the creation of the creative product in animation is determined by market-driven or technology-driven factors, or it can be based on freedom of expression. Chapman *et al.* (1997:44) argue that in the formulation of the creative process in major collaborative projects such as animation, production teams are assembled based on the skills they have. In computer animation production, for example, a creative director does not need to know how to operate equipment (camera or computer software) but may only be responsible for artistic direction, whereas the technical director can solve any technical challenge in order to make artistic direction possible. Although the nature of animation production involves a combination of specialists in different disciplines, in small companies animators overlap duties and that remains a challenge with regard to skills acquisition. It is evident that an animator would be expected to know and execute each animation production phase in a small company (see figure 3.8).The majority of the production steps in figure 3.8 take place in nonlinear form; however, in order to make them more comprehensible, they can be categorised under the following basic stages of production process, as illustrated by Musburger and Kindem (2009:33-36):

- **Pre-production**
  - Developing idea – financing and assembling teams
  - Scriptwriting – record scratch dialogue
  - Storyboarding – Animatics, production flow and schedule
  - Character design
  - Visual development
- **Production**
  - Model characters – sets and props
  - Build IK skeletons – paint and scan textures
  - Animate characters – write shaders
  - Scene layout – camera setup and rendering tests
  - Facial blend shapes and lip sync – animate effects
  - Record dialogue and sound tracks – light the scene
- **Post-production**
  - Final rendering
  - Compositing
  - Reviews
  - Final output
  - Edit image and sound
  - Quality control and release

According to Bilton (2007:30), the freedom to be creative is strictly controlled within hierarchical positions and departments. In simpler terms, hierarchical positions and departments can exist in collaborative projects in two ways: within the company and with outside companies. In order to indicate roles and hierarchical limits in a production, whether in a team or outsourced company, the following four basic stages of the production pipeline can be used: development, pre-production, production and post-production. These stages are usually used in the production process of film, animation, corporate video, CD-ROM/DVD, the internet, cell phone graphics,

educational applications, interactive web sites, interactive information kiosks and interactive training (Musburger & Kindem 2009:33-36).



**Figure 3.8:** Production pipeline for a small computer animation team, illustration (Source: Kerlow 2009).

Using DreamWorks pictures and PDI animation studio basics of the computer animation process for the movie *Antz* (1999) as an example, directors Eric

Darnell and Tim Johnson (1999) explain in the DVD bonus material how they made this animated film. They used four basic stages of production, namely storyboard, layout, motion and final lighting. The storyboard is usually used to translate script into a drawn sequence of visuals and 'timing' of the length of a shot or a scene. According to Darnell and Johnson (1999), about 15 storyboard artists worked on this production. During these early stages they used temporary voice talent, and they used their own voices to guide them in timing and planning for animation. They further estimated that it took them at least six months to try out different ways of solving problems of visual presentation, such as composition, during the storyboarding stage. The main function of the storyboard is to guide any motion picture's production team. It is crucial for the head of the visual effects team to get the storyboard at an early stage in order to address the challenges and the solutions in collaboration with programmers.

In the second stage of production – identified as layout – directors work with layout artists and cinematographers to make sure that cameras are placed at the right angles, and that characters and composition are framed correctly before they go to the final animation stage. This approach helps animators to animate according to the camera's point of view (Darnell & Johnson 1999). During the production of *Antz* it took at least four people to complete the layout design. During the fourth stage of the actual creation of illusion of movement, two supervisors guided 24 animators to maintain the performance of the characters in the film. The choreographer also worked together with animators, especially for the dancing scenes. For the final lighting stage, 30 team members worked under the supervision of four supervisors – from technical (programmers) to artistic (painters). The success of the whole production also depended on the heads of and management of production teams and character designers, among others (Darnell & Johnson 1999).

Based on Darnell and Johnson's (1999) commentary on the making of *Antz*, there is evidence that throughout the production of the movie each

production team or department had its own specific role, within hierarchical limits, in collaborative projects. All specialised, skilled individuals worked under strictly controlled hierarchical positions and departments. Each department had at least two or more supervisors and all the departments worked together towards achieving a creative product.

Even though the situation as described above could be the case, Wells (2002:3-4) quotes Preston Blair (1994:6), veteran animator: “animation is both art and craft; it is a process in which the cartoonist, illustrator, fine artist, screenwriter, musician, camera operator and motion picture director combine their skills to create a new breed of artist – the animator”. In educational programmes, the use of computers as a tool to produce artworks has raised a number of concerns. The intention of this study was not to discuss influences of curricula in detail, but to point out the tension between technological knowledge and artistic principles in computer animation. Regarding multimedia design education, Mitchell (2003:1-2) contends that technical skills are dominating the artistic, cultural and philosophical aspects in the production of artworks, and that the academic aspects are seemingly less important. Chapman *et al.* (1997:40), on their part, investigated the relationship between students’ attitudes to creativity and the computer. The results of their investigation indicated that most of the students “develop their computer skills, but find it hard to use these skills to produce inventive design work”. This clearly demonstrates that prior domain knowledge in traditional artistic principles is being taken for granted in the production of the creative product and that technological knowledge is given higher priority.

There are numerous factors that might influence such curricula, for instance, the preferred requirements as stated in job advertisements in the creative industry. An example is the specification of certain skill requirements such as a proficiency in Adobe Illustrator, which reflects the preferred use of certain software by various studios (Dyson 1997:57). Another example can be seen in the pilot study ‘*Creative Industries Pilot Progression Project Graphic*

*design, Illustration, Animation, Interactive Media Design* Hume and Sizer-Coy (2009:18). This study indicated that in order for the people entering the animation industry to secure jobs they must have high levels of technical skill in 3D computer animation software. Worldwide, companies specialising in computer-generated animation struggle to find experts in this area (Hume & Sizer-Coy 2009:20). It was further found that companies specialising in computer-generated animation are businesses that are growing and profitable. One of the challenges in filling these gaps is that new animators and established animators struggle to take advantage of new technology in creating new digital content.

The challenge is that technical skills alone cannot guarantee a creative product – critical thinking and other cognitive skills also contribute equally in the production process. Candy and Edmonds (1999:5) argue that artists and designers involved in individual projects usually formulate their creative processes around the tools they know in order to be productive. Furniss (2007:176) holds a similar view that “the quality of the artists and ability to use the technology are important”. Robinson (2001:128-129) argues that creative abilities are normally aided by the medium which artists or designers choose to use. His argument is based on three features he identified for the process of being creative: “The importance of finding the right medium for your own creative strengths, the necessity of being able to control the medium and the need for freedom to experiment and take risks”. Weisberg (1999:227) has also emphasised that “extensive domain-specific knowledge is a prerequisite for creative functioning”.

The argument Robinson (2001), Furniss (2007), Weisberg (1999) and Candy and Edmonds (1999) put forward can be associated with the psychomotor-domain skills or domain-relevant skills which are one of the important factors in learning the production process. The evidence for such a claim can be seen in Hayes and Mellon’s (1990:6-7) argument that sometimes it takes much effort and a long time for one to acquire knowledge and skills relevant



to a domain-specific creative process. Hayes and Mellon (1990) say, for example, that it takes at least 10 years before one can achieve consistent creative productivity in the domain-specific fields such as music, art and chess. The view that it often takes a long time for one to acquire knowledge in order to achieve creative productivity seems to be dictating the creative process to some extent. This is confirmed in the P-creativity or H-creativity theory defined by Boden (1994) or the process of skill-acquisition identified by Mitcham (1994) or even the technological knowledge mentioned by Herschbach (1995).

According to Penny (1995:95), in 1992 the Prix Arts Electronic competition introduced a set of rules and restrictions to the works produced using interactive packages and special written software because most of the competition winners were technically highly skilled people who wrote their own software. Penny pointed out that artists or designers with higher levels of technical skill have a good chance of excelling in solving technical problems in producing creative products. Similarly, Darley (2003:88) mentioned that the search for technical solutions to achieve spectacular effects in terms of high resolutions, manipulation and compositing of images is becoming more important than traditional notions of aesthetics or representation in commercials.

Despite the importance of technical skills, Pricken (2004:14) argues that creativity is more important than technology in advertising, the cinema, and all other media. Pricken (2004) interviewed top creative directors and visual effects supervisors, among others, and some of them confirmed Pricken's argument. For example Matthia ZenTner, (motion graphics designer) said "I deliberately forget what is technically possible and free myself from the constraints of technology" (Pricken 2004:25), while Ben Snow (visual effects supervisor) thinks that "it is very important to free the initial conceptualisation and creative process from thoughts about what is technically feasible...it's much easier to find technology to fit your ideas than ideas to fit your

technology” (Pricken 2004: 28). Youngwoong Jang, a winner of the Academy for Motion Picture and Arts Sciences Gold Medal for best student film, also asserts that it is important to create a good story, “show your creative skills and have a professional visual sense to show your technical quality” (Wells & Hardstaff 2008:18). In their paper ‘*Production and political economy in the animation industry: why insourcing and outsourcing occur*’, Tschang and Goldstein (2004) used Pixar’s production process technology model as an example to demonstrate the importance of creative skills over technical skills. In acknowledging the importance of technology, Tschang and Goldstein (2004:10) argue that “despite its importance, in Pixar’s production process technology is still led by the creativity of the story and the visual effects desired to support it.” In this regard, the implications or high risk of technology being given more attention than creativity in animation production is known in the industry. One of the examples of the animation production failure, where technology was given preference, is *Final Fantasy: The Spirits Within*. According to Tschang and Goldstein (2004:10), “Final Fantasy fell flat with a plot and dialogue that did not move these animated humans into a more compelling and immersive setting.” The reason for this was that most its production cost was spent on the technical execution of the movie and less on the development of the story.

It is evident that neither technical skills nor creative skills alone can guarantee a creative product within an individual project or collaborative project. In animation, domain-relevant skills can be referred to as artistic principles and technological knowledge. Creativity-related skills deal with a story idea, conceptualisation of a story and translation of scripts into character performance and motion. Task motivation is basically to tell a story with the aim, for example, of entertaining, or teaching. In an individual animation project or in smaller companies, it is common for the practitioner to run a project on his or her own from conceptualisation to completion (Bilton 2007:27). In a collaborative project, individuals are given particular roles based on their job position within a team with the aim of telling a creative and

technically astute visual story (Chapman *et al.* 1997:44). The success of an animator in a production process is determined by an ability to tell a story or to create an illusion of movement without compromising technical, aesthetic and conceptual continuity (Wells 2002:7).

### **3.8 Chapter summary**

The notion of creativity is not easily definable although it is understood in various forms as an inventive thought process (Taylor 1988:118; Hayes & Mellon 1990:1; Boden 1994:76; Bilton 2007:45). It was further pointed out that creativity cannot only be understood as a thought process. Candy and Edmonds (1999:3) and Russ (2007:2) suggest that a creative product must be accepted by experts within a domain-specific field based on the principles or standards of that particular field. With regard to the definition of technical skills, the most important words related to the term *technical* are *technique* and *technology* (Mitcham 1994:235; Herschbach 1995:1; Krathwohl 2002:212). Therefore technical skills could be understood as any advanced special knowledge acquired through learning, and the application of techniques in the animation production. It also became evident that technical skills and creative skills are linked and that both skills drive each other in the animation production process. Weisberg's (1999:227) statement that "creativity drives technical skills" can be interpreted as meaning that technical skills are static until manoeuvred by creative thoughts. Based on the view that domain-relevant skills and creativity-related skills contribute equally in the production process of a creative product (Conti *et al.* 1996:385), it can be said that technical skills inspire creative skills and creative skills challenge technical skills. Each department in an animation production goes through its own stages of creativity with a fundamental goal of amplifying the storyline. Technical skills are necessary to translate scripts, sketches, storyboards and aesthetic visualisations into a believable animation world and for a more engaging experience for the audience. The animation production pipeline or cycle also indicated possible hierarchical positions and divisions in production processes. It was also clear that through the computer animation

production cycle, there are new animation techniques that animators have to adapt. For example, old traditional principles of animation are no longer enough to tackle computer animation (Kerlow 2009). In addition, principles of animation and production cycles are used in a similar way in any type of animation production.

Although technical and creative skills are equally important, different views emerged with regard to whether technical or creative skills are more important in computer animation. Each side of the argument indicated the significance of both skills. Subsequently it appeared that there are a number of variables that could determine and explain these different views, such as company size or job positions.

Chapter 3 discussed two types of skills used in an animation production: technical skills and creative skills, and which one is considered more critical. Technical and creative skills were defined and clarified. The relationship between technical and creative skills and the contexts in which animation can be made were also examined. In the next chapter an attempt will be made to collate information using a questionnaire survey and a series of interviews carried out with animation departments in South African animation/post-production/production companies.

## CHAPTER 4

### METHODS AND PROCEDURES

#### 4.1 Introduction

Previous chapters have been devoted to the discussion and understanding of the various fundamental concepts, perspectives and ideas prevalent in the field of computer animation. This chapter is primarily concerned with methods and procedures. Different authors talk about a variety of methods in social science research; for example, Babbie & Mouton (2003:xxiv-xxv) identified three broad methodological paradigms, namely quantitative, qualitative and participatory action paradigms. Creswell (2009), among others, talks about quantitative, qualitative and mixed methods. Although there are different methods, there is a consensus among authors or researchers that each method is unique and their effectiveness or accuracy depend on the type of research problem investigated (Babbie & Mouton 2003:xxiv-xxv; Henning, van Rensburg & Smit 2004:2). In the light of whether the selected methods are reliable or not, it is the responsibility of the researcher to select methods and procedures that are suitable for the type of the inquiry investigated (Denscombe 2010:141). The selection process of the correct research methods can also be guided by philosophical assumptions or by the stance that a researcher can take, such as positivism, interpretivism or pragmatism (Babbie & Mutton 1998:59-66). Consequently, in an attempt to obtain a broader understanding of the subject matter, an explanatory sequential mixed-methods approach was thought suitable for this research project. The early developments of mixed-methods research can be traced back in the field of psychology to the writings of Campbell and Fiske in 1959 (Ivankova, Creswell & Plano Clark 2007:262). In recent years, the mixed-methods approach has gained recognition in different fields of research for its multiple data collection methods (Ivankova *et al.* 2007:262). Tashakkori and Teddlie (2003) are among the early authors to popularise mixed methods in social

research. One of the main reasons for the popularity of the mixed-methods approach is that it allows the researcher to “directly compare and contrast quantitative statistical results with qualitative findings or to validate or expand quantitative results with qualitative results” (Creswell & Plano Clark 2007:62). The philosophical basis on which the mixed-methods approach is centred is called pragmatism. The term pragmatism refers to “A philosophy that allows researchers to be eclectic in their choice of methods” (Denscombe 2010:131). According to (Ivankova *et al.* 2007:262) the pragmatist’s view is that “research questions are considered to be more important than the methods used to answer them or philosophical views underlying each method”. Therefore both quantitative and qualitative research was used in this study in order to support each other and to better understand and explain the findings. Statistical or interview findings alone would not have been sufficient to increase understanding of the scope of this topic.

This study involved two phases: the application of a questionnaire survey followed by interviews. This can be described as a sequential mixed method (Tashakkori & Teddlie 1998:149; Creswell 2009: 14) or a sequential explanatory design (Bergman 2008:69). During the first phase the aim was to collate views on critical skills required for entry level animators in the selected South African computer animation companies. The sample involved 24 South African companies, 12 in Johannesburg and 12 in Cape Town. This enquiry was guided by the following objectives:

- To establish what critical skills animation companies require for entry level animators.
- To determine which skills – technical skills (computer use) or creative (conceptual) skills – are considered more critical for entry level animators in the selected company.
- To find out whether teaching institutions of computer animation should focus more on technical or on creative skills

The aims during the second phase of data collection were:

- To gather more information on the results of the questionnaire survey, and
- To confirm the results of the questionnaire survey.

This chapter is structured according to two phases. In phase one, the questionnaire survey will be discussed by looking at the questionnaire design, formulation of questions and statements, sample selection, piloting of the questionnaire and data collection. In phase two, the interview survey will be discussed by examining the interview schedule design, the population of the study, ethical considerations of the study, fieldwork, preparation of transcriptions, analysis and interpretation of raw data, and the reliability and validity of the interviews.

## **4.2 Phase one: questionnaire survey**

### **4.2.1 Questionnaire design**

The word *questionnaire* can be described as a collection of questions and statements whose primary goal is to collect accurate quality research data (Babbie and Mutton 1998:233). It is the role of the researcher, therefore, to consider and obey certain principles in order to achieve accurate quality research data. One of the main principles includes the wording of questions, which can mislead participants if they are not constructed well. This can happen especially when the researcher did not consider the level of literacy of the targeted population. Another one of the factors could be the length of the questionnaire and the order of questions. The drawback with long questionnaires is that participants might not be able to answer all the questions because of time constraints (Neuman 2009:166-167). Equally importantly, Neuman (2009:157) emphasises that a good quality survey is guided by the valid and reliable measures of the variables of the problem investigated. It is in this context that a questionnaire was constructed with the goal of evaluating the participants' views on critical skills required for entry level animators. During the literature review of the study it became clear that the developments of computer animation raised different views as to which

skills, technical or creative, were considered critical for animators. The following three important opposing views emerged: (a) technical skills are more important (b) creative skills are more important (c) both are equally important. In an attempt to develop the questionnaire, the following variables were identified as the results of the three opposing views during the literature review:

- Company type
- Company size
- Job position/level
- Production type

According to Bilton (2007:27), in smaller companies, it is common for the practitioner to be in charge of a project, on his or her own, from conceptualisation to completion. On the other hand, in a collaborative project individuals are given particular roles based on their job position within a team with the aim of telling a creative and technically astute visual story (Chapman *et al.* 1997:44). In addition, Bilton (2007:30) stated that the freedom to be creative is strictly controlled within hierarchical positions and departments in most advertising agencies. He also mentions that some of the advertising agencies outsource services to outside companies. In simpler terms, hierarchical positions and departments can exist in collaborative projects in two ways: within the company and outside companies. Wells and Hardstaff (2008:48) mentioned that animation can be made through many working contexts and, according to Kerlow (2009:60-62), computer animation projects can be made in the following types of animation production:

- Feature length film (90 minutes)
- An experimental animation short (4 minutes)
- A visual effects shot for a live action sequence (10 minutes)
- Commercials (15 seconds)
- Animated series for TV/internet (15 minutes for TV and 2 minutes for internet)
- Game platform (300 moves)



#### **4.2.2 Formulation of questions and statements**

Babbie and Mouton (1998:233) pointed out that statements can be referred to as questions in a questionnaire. The reasoning behind this view is that if the research is aimed at measuring the respondents' attitudes, statements can be presented in the form of a Likert scale. This will provide respondents with options to indicate whether they strongly agree, agree, disagree, strongly disagree or whether they are undecided. Babbie and Mouton (1998) further explain that the use of both questions and statements can be useful in the layout of a questionnaire. In the light of Babbie and Mouton's (1998) suggestion, it was decided to use both questions and statements to construct the questionnaire. In a similar vein, Neuman (2009:160) points out that "survey experts have debated the plusses and minuses of using open-ended versus closed-ended survey questions". The use of either of these two types of questions depends on the purpose of the study. It is also believed that open-ended questions take longer to answer and they are mainly used in exploratory research. For the purpose of this study, there was a balance of open-ended and closed-ended questions in order to explore the participants' views. Neuman's (2009:156-158) six principles of wording of the questions in a survey were also considered and time was given to the thought process in the formulation of the questions. This was done in an attempt to avoid obvious questionnaire mistakes. Some of the questions were corrected and improved during the piloting of the questionnaire.

The questions were designed to:

- Obtain responses to the core questions: What critical skills does your company look for in new animators? How do technical skills and creative skills relate to each other in computer animation productions? 'Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company? Should teaching institutions of computer animation focus more on technical or creative skills?

- Gather information about the respondents, such as the name of the company, the job position, company type, the type of animation production and company size.
- Provide respondents with the opportunity to make general comments and suggest improvements to the questionnaire.

#### **4.2.2.1 Questions**

##### **(i) What critical skills does your company look for in new animators?**

In the animation production process or pipeline there are many skills sets required for different roles in different departments. As previously stated by Bilton (2007:27), an individual can run a project from conceptualisation to completion in a small company, where he or she is expected to play multiple roles. In this context, according to Wells (2002:7), the success of an animator in any production process is determined by his or her ability to tell a story through performance without compromising technical, aesthetic and conceptual continuity. In addition, Wells (2002:3-4) describes the nature of animation as a combination of skills, including those of cartoonist, illustrator, fine artist, screenwriter, musician, camera operator and motion picture director, which creates a new breed of artist – the animator. On a production level, the best way to understand how animation works is through its production cycle (Patmore 2003:74). It must be noted that there are different approaches to computer animation processes for different types of animation products. However, there is general consensus on telling a story through character performance as a common factor in all these different types of productions (Wells (2002:7); Patmore (2003:10); Kerlow (2009:49); Pricken (2004:14)). All types of animation productions start with an idea, with the goal of telling a story or communicating a message. This can be seen in Kerlow's (2009) small production pipeline (see figure 3.8) as a primary reference. It is clear that skills required for an animator to complete an animation production from start to completion ranges from the idea generation to the final distribution (see annexure A). Based on these views, skills sets for this

question were identified from the whole animation production cycle or pipe line perspective.

**(ii) How do technical skills and creative skills relate to each other in computer animation productions?**

It was clear during the literature review that technical and creative skills serve each other equally in a production process (Conti *et al.*1996). One cannot exist without the other, whether is in a small company or large company or in collaboration projects. Teams are assembled to complement skills in animation projects or productions (Kerlow 2009:70). Although this is the case, different views emerged as to which skills, technical or creative, are more important. It became appropriate to formulate this question in order to ascertain the participants' views on the relationship between technical and creative skills (see annexure A).

**(iii) Statement: Usually, junior computer animators' working context requires executing creative ideas developed by others.**

According to Kerlow (2009:70), animation studios usually work in collaboration with advertising agencies in productions such as commercials. The role of the animator in this instance is to execute the clients' ideas. Chapman *et al.* (1997:44) also echoed the same view, that team members are given roles based on their strengths and job positions. The evidence of these views can be seen in Darnell and Johnson (1999). Individuals work in strictly controlled positions and under supervision. Since the junior is working under the supervision of the senior animator or director, the aim of this statement was to find out whether junior animators just follow instructions or whether they can also contribute to creative input.

**(iv) Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company?**

In chapter 3 of this study it was evident that the development of computer-generated animation has led to different views as to which skills, technical or creative, are considered critical. There is a common consensus that in smaller companies, usually, individuals have to multi-task, while in bigger companies individuals can specialise. The study by Penny (1995) indicated that artists with higher levels of technical skills have a good chance of excelling in solving technical problems in producing creative products. In a similar vein, Hume and Sizer-Coy (2009) pointed out how important it is for the people entering the animation industry to have high levels of technical skills in 3D computer animation software.

In contrast to the above, Chapman *et al.* (1997:40), Dyson (1997:57), Mitchell (2003:1-2) and Darley (2003:38) remind us that technical skills are becoming more important in education and in production processes and that this does not serve artistic principles well. According to Wells (2002:19), the use of computers has changed animation production processes to some extent; however, the generation of ideas or storytelling has remained unchanged (Pricken 2004:4). This means that story and character are still critical for animation production. Subsequently, Pricken (2004:14-18), Tschang and Goldstein (2004:10), Wells and Hardstaff (2008:18) argued extensively that creativity is more important than the application of technical skills.

Flowing from the above opposing views, Conti *et al.* (1996) on the other hand, argue that technical and creative skills contribute equally in the production process of a creative work. Taking these views into consideration the question on technical and creative skills was formulated. This was developed in an attempt to determine the views of the participants on how this issue plays out in their selection process for entry level animators (see annexure A).

**(v) In your opinion and from your experience, should institutions teaching computer animation focus more on technical or on creative skills?**

The South African animation industry has grown to the point where animated feature films can be produced (2006:4,7) as well as the television series targeted at the South African market( 2006:7). In the mid-1990s most of the studios survived on commissions for commercials (Wright 2005:34-35). Even today many animation studios, production houses and post-production houses with animation departments are sustained by the commercials market. Visual effects artists also have proved to be competitive internationally in terms of their successful work in a number of films (2006:4,7). Recent years have also witnessed collaboration in animation projects between South African companies and international companies (2009:25).

Although the future of the animation industry is promising in South Africa, the Department of Trade and Industry report (2006:16) identified the lack of content development skills and technical skills in the film industry. Government agencies and industry associations joined forces in addressing this problem (2009:7). Based on the successes and the lack of certain skills in the film (animation) industry, it was decided to formulate this question to gather the participants' views on the teaching institutions of computer animation (see annexure A).

#### **4.2.3 Piloting**

Babbie and Mouton (1998:244) discuss the significance of pre-testing questionnaires, either in full or in part, in order to avoid errors. They indicate that the sample for such a process can be compromised by any person with relevant knowledge of the issues or subject and not necessarily by the representatives of the study. The main purpose of testing a questionnaire is to check whether the layout design, wording of questions and order of questions are working and whether the time spent in completing the

questionnaire is reasonable or not (Neuman 2009:157). Therefore, for the purpose of piloting questionnaires for this study, it was decided that four people, two educators and two animators, should be used. The sampling of the four participants was based on their field of work as practitioners and educators. The animators have the industry knowledge of the subject matter and their level of knowledge could also be useful in improving the questionnaire. On the other hand, educators have the research experience and knowledge in terms of questionnaire design and related research methods. Subsequently, two of the four participants managed to complete and return the questionnaire. The following questions were included:

- How long did it take to complete?
- Were the instructions clear?
- Were any questions unclear or ambiguous?
- Did you object to answering any question?
- Was the layout clear and attractive?
- Any other comments?

The responses (see Table 4.1) helped in improving the questionnaire in certain instances. Respondent **P1** suggested some adjustments to the questionnaire in question 5. This question was constructed as an open-ended question. It required the pilot participants to list five critical skills required for entry level animators. **P1** felt that there was too much to write and that the question was too demanding. In light of **P1**'s view, Neuman (2009:160) also explains that one of the challenges of open-ended questions is time. In addition, he highlighted the fact that open-ended questions take longer to complete and participants can easily give unnecessary information. In order to address the problem with regard to question 5, the open-ended question was changed to a closed-ended question. This proved to be useful and the participants were accordingly provided with skills applied in a production pipeline. In addition, the space for comments was added in order for the participants to comment.

**Table 4.1:** Questionnaire piloting results

Questions	P1	P2
How long did it take to complete?	-	15
Were the instructions clear?	yes	yes
Were any questions unclear or ambiguous?	-	no
Did you object to answering any questions?	no	no
Was the layout clear and attractive?	-	yes

The result of the pilot questionnaire indicated no objection on the questionnaire design, because it allowed people to give both statistical (quantitative information) and opinions (qualitative information). The time spent on completing the questionnaire (Table 4.1) was within reasonable limits and the questionnaire was sent through e-mail.

#### **4.2.4 Sample selection**

Sampling of the appropriate population plays a role as important as any other procedure in research. Neuman (2009:88) put it in this manner: “A proper sample allows you to study features of the sample and produce highly accurate generalisations about the entire population”. For this reason, the researcher must avoid selecting inappropriate units of analysis (Alreck & Settle 2004:66). Therefore the issue of reliability and validity is centred on the appropriateness of the sampled unit of analysis. Consequently, there are a variety of sampling techniques that can be used to select proper samples of population (Babbie & Mutton 1998:164-172; Neuman 2009:88-91). For the purpose of this study, sampling of the participants for the questionnaire and interviews was determined by purposive sampling. The technique of purposive sampling refers to a “non-random sample in which you use many diverse means to select units that fit very specific characteristics” (Neuman 2009:90). During the sampling of the possible respondents for both phases of the study Babbie *et al.*’s (2001) description of Spradley’s (1979) criteria for selecting respondents for interviews was adopted. The criteria include thorough enculturation, current involvement and adequate time (Babbie *et al.* 2001:288). Thorough enculturation and current involvement were used to

identify relevant participants in the questionnaire survey. Animation directors, lead animators and animators were considered appropriate because of their thorough enculturation in animation domain-relevant skills and creativity-relevant skills.

The population of the study consisted of practitioners in selected South African computer animation companies (animation studios, post-production and production companies with animation departments). The sampling frame of a total of 24 companies was identified from the internet directory [www.animationsa.org](http://www.animationsa.org). In the study, the sampling unit was selected from companies in Johannesburg and Cape Town only because leading animation studios, post-production houses and production houses are situated mainly in these cities. Therefore it was decided to limit the study to those companies in these cities.

According to Struwig and Stead (2001:119), “it is accepted in theory that the larger the size of the sample, the greater the likelihood of its precision or reliability, but there are practical constraints that the researcher must acknowledge”. Additionally, on the basis of studies conducted in the past, for example, Hattingh’s (2005) doctoral thesis entitled “An investigation of influences on the South African social documentary photographer during the 1980s and 1990s”; one can use such a study population as a guideline to determine the sampling frame. Bearing in mind the practical constraints, studies conducted in the past and without compromising the quality of the study, the sample size of 24 companies in Johannesburg (12) and Cape Town (12) was considered adequate for this study, but a larger size would have been ideal. The following 24 companies (Table 4.2) were randomly selected, based on their availability and functional and updated contact details:



**Table 4.2:** Selected companies in Johannesburg and Cape Town

<b>Cape Town</b>	<b>Johannesburg</b>
1. Black ginger	1. Solid Black
2. Green house cartoons	2. Animate
3. Triggerfish	3. Bugbox
4. 10kilo	4. Firefly animation
5. Character matters	5. Jock-animation
6 Disko	6. Mind's eye creative
7. Lung	7. Ministry of Illusion
8. Rooftop	8. Masters and Savant
9. Shape shifters animation	9. The Refinery
10. Strika/Magic Illusion	10. Urban Brew
11. Sunrise	11. Red Pepper
12. Blink Tower	12. Sphere animation

#### **4.2.5 Questionnaire survey data collection**

The instrument used for data collection during this phase was e-mail. The initial plan was to use Microsoft Office Word 2003 electronic file format to be sent via e-mail. The researcher was aware of difficulties such as getting incorrect e-mail addresses, and the problem of surveys being completed and returned. There were a few cases where the participants complained about files being corrupted or not accessible. This happened with Cape Town companies and the solution to this was to use different file format extensions e.g.. \*.Doc., \*.Rtx, \*.Pdf. The cause of the problem was not clear. The use of file extension \*.Rtx and the personal e-mail solved the problem. With regard to research ethics, according to Neuman (2009:62) "Researchers have a strong moral and professional obligation to act ethically at all times and in all situations". Electronic questionnaire formats clearly stated that the questionnaire survey was voluntary and that respondents would remain anonymous. The letter explaining the purpose of the study and the permission to distribute the questionnaire to the above-mentioned companies (Annexure B) was sent before the questionnaires were distributed.

Furthermore, participants were assured that the information supplied would be handled according to the code of research ethics of the Vaal University of Technology (Annexure C).

During the planning stages of the project a logic model from the Planning and Evaluating Health Information Outreach Projects (Olney & Barnes 2006:2-5), was adopted, which entailed an outcomes-based project plan, an outcomes assessment plan and a process assessment plan.

The project plan was developed by identifying resources, activities, deliverables, and outcomes. This was followed by objectives and methods of assessing them. Three objectives were identified, each with its own measurable indicator, target, and timeframe. The process assessment plan (Annexure D) was designed to record all the steps taken in order to phone, send out questionnaires and contact persons in the companies. The e-mail questionnaire return rate was good, especially from the companies that were phoned before sending of the permission letter.

### **4.3 Phase two: Interviews**

#### **4.3.1 Interview design**

Phase one of the fieldwork (questionnaire survey) aimed at exploring practitioners' views on critical skills required for entry level animators in computer-generated animation. The intention of phase two (data collection) was to gather more information on the participants' views on the critical skills required for entry level animators in computer-generated animation. According to Kvale and Brinkmann (2009:113), it is common in interview studies to have at least 15 interviews, as allowed by time and resource factors. They argue that by adding more respondents, one might not necessarily increase new knowledge. For the purpose of this study it was decided to use semi-structured interviews and seven people participated during the interview survey (six semi-structured interviews and one telephone interview). The reason for one telephone interview was that the participant did

not have time to be interviewed during working hours. Although it is believed that anyone is a potential participant in gathering qualitative data (Babbie, Mouton, Vorster & Prozesky 2001:288), during the sampling of the possible respondents for the second phase of the study, the description of Spradley's (1979) criteria, in Babbie *et al.* (2001), for selecting respondents for interviews was adopted. The criteria include thorough enculturation, current involvement and adequate time (Babbie *et al.* 2001:288). The criterion of adequate time was used to identify potential companies to participate in the interviews, based on their interest and availability as shown during phase one (questionnaire survey). The following companies (Table 4.3) were selected:

**Table 4.3:** Companies identified as potential participants in the interviews

<b>Johannesburg</b>	<b>Cape Town:</b>
- Ministry of Illusion	- Wicked Pixels
- Solid Black	- Blink Tower
- The Refinery	- Rooftop
- Bugbox	- Triggerfish

The criteria 'thorough enculturation' and 'current involvement' were also considered in the cases where companies had either one or two persons who managed to complete the questionnaire. For example, in the cases where only one person completed the questionnaire in a company, they were mainly animation directors/lead animators. In the second case, where more than one person completed the questionnaire from one company, one person was selected based on his or her hierarchical job title, i.e. director, lead animator, head of animation, and his or her availability. Open-ended questions were used, in this instance, in order not to limit the respondents' views. Selected questionnaire respondents' results (statistics and comments) were also added in the interview schedule. The interviews followed a prescriptive schedule, but also gave the participants an opportunity to raise issues that might have been relevant to the study. The final schedule used is attached as Annexure E.

### **4.3.2 Ethical considerations of the study**

Kvale and Brinkmann (2009:62) emphasise the ethical significance of treating the whole process of data collection with respect and confidentiality because of its involvement with people's personal lives in a public arena. Taking Kvale and Brinkmann's (2009) concerns into consideration, the study was guided by the following ethical aspects (cf. Babbie & Mouton 1998:520-525; Hattingh 2005:128; Kvale & Brinkmann 2009:68):

- informed consent,
- confidentiality,
- consequences, and
- the role of the other.

#### **4.3.2.1 Informed consent**

During the briefing, the participants were informed about the aims and objectives of the study and that participation in the study was voluntary. One company would have liked to participate in the second phase of the study through telephone interviews in Cape Town, but it was unable to provide the contact telephone numbers of the animator who completed the questionnaire. Follow-ups through e-mail and telephone were made but there was no response. Because his views on the questionnaire results were unobtainable the company was removed from the schedule.

#### **4.3.2.2 Confidentiality**

During the briefing it was explained to the participants that all the information collated would be used according to the research ethics policies of Vaal University of Technology (see Annexure C). The participants were assured of their anonymity and that codes such as INJHB 1/INCPT 1 would be used instead of their real names.

#### **4.3.2.3 Consequences**

During phase one (questionnaire survey) of the study, all companies were sent a letter informing them of the intention of the study (see Annexure B). This was done by e-mail. Permission for interviews was also requested telephonically and through e-mail from the contact persons of all selected companies. The reception from some companies was warm and welcoming whereas other companies did not even consider the request.

#### **4.3.2.4 The right not to be harmed in any manner**

It was agreed to send the recorded interview data to the participants should they request them. The whole interview process went according to plan and most of the discussions were very interesting, except that on one occasion, a phone call interrupted the interview process. However, one of the animators helped to answer the phone call. The problem was that the animation working area of that company shares space with the administration office. In all the interview sessions the interviewer arrived 10 to 20 minutes late, having lost the way and been delayed by heavy traffic. However, all interviewees understood the situation and allowed the interviews to carry on.

#### **4.3.3 Interview data collection**

Different instruments can be used to collect data in different ways in qualitative research. Boeiji (2010:58) for example, describes how a researcher can use everyday life materials to collect research data. He provides examples ranging from chat sessions to focus group interviews. As a result, it is up to the researcher to decide whether the method chosen is appropriate or not, based on the type of inquiry. The emphasis here is that, irrespective of the method and instrument used, what matters most is that the evidence is not questionable in terms of reliability and validity. Since this study is using semi-structured interviews there is a need to follow certain principles in order to produce quality researched evidence. Boieje (2010) explains the point made by Morse & Field (1996), that poor interview planning can easily result in getting irrelevant information. A detailed guide to

the interview schedule was used for the individual interviews, most of which lasted about 30 minutes. A smaller number took 35 minutes. The interview schedule was based on the questionnaire results (see Annexure E). The first phase of the interviews took place in Johannesburg on 24 February 2012 and 27 February 2012, and the second phase took place in Cape Town on 14 March 2012. All the interviews (both in Johannesburg and Cape Town) were held in the boardrooms and editing suites of the selected companies' offices. One participant was interviewed by telephone, one in an editing suite, two in their offices, one in a boardroom, one in a company cafeteria and one in a waiting room (Table 4.5). A Zoom digital recorder was used to do the recording in both Johannesburg and Cape Town. A notepad and pencil were also used to take notes.

**Table 4.4:** A list of interviewees interviewed, in alphabetical order.

<b>Date 2012</b>	<b>Participants</b>	<b>Position</b>	<b>Company</b>	<b>Approximate duration</b>	<b>Location</b>
14 March	<b>Adrian Burger</b>	Creative director	Blink Tower	38 minutes	Cape Town: Woodstock
14 March	<b>Gavin Coetzee</b>	Creative director	Wicked Pixels	33 minutes	Cape Town: Woodstock
24 Feb	<b>Hans Sedgwick</b>	Animation director	Solid Black	30 minutes	Johannesburg: Randburg
24 Feb	<b>Heidi Stohr</b>	Animator	Bugbox	33 minutes	Johannesburg: Randburg
27 Feb	<b>Jean du Plessis</b>	Senior VFX	The Refinery	20 minutes	Johannesburg: Randburg: Telephone
14 March	<b>Quentin Vogel</b>	Lead animator	Triggerfish	36 minutes	Cape Town: Dreyersdal farm, Bergvliet
24 Feb	<b>Rory Mark</b>	Head of animation department	Ministry of Illusion	29 Minutes	Johannesburg: Randburg

Babbie and Mutton (1998:289-290) and Boeije (201:62) describe the importance of the relationship between the informant and the interviewer during interviews. They all share the view that it is the job of the interviewer to make conversation comfortable for both parties involved. One of the tips

for achieving normal conditions for interviews to take place is that the researcher should listen and guide the discussion (Babbie and Mutton (1998:289-290) and Boeije (201:62)). During interviews enough time was given the interviewees, especially in cases where they wanted to elaborate on particular points or questions. This was done in order to build the trust and confidence of the interviewees. The participants were also informed about the ethical principles discussed earlier.

#### **4.4 Transcripts**

For the purpose of this study, the suggestion of Kvale and Brinkmann (2009:180) was followed that researchers who transcribe their own interviews have the opportunity to start interrogating gathered information from the early stages. All seven participants' interviews were transcribed verbatim. There were 22 pages of transcripts (Annexure F). The recorded audio was checked for audio levels and some technical audio-recording problems were found on one file of the participant interviewed in Cape Town. The frequency of the sound was mute and there was no solution to the problem. However, notes were taken and were used for the interpretations and discussions of the findings. The file seems to have been corrupted by the virus which could not be detected from the SD.MS card. A smart phone Nokia E5 was used to record the telephone interviews. The type of phone used has the capacity to record more than an hour of recording time and video conferencing. The phone interviews and the zoom digital sound recorder interviews were then downloaded onto a laptop. Both concept-driven and data-driven coding, as described by Kvale and Brinkmann (2009:189-203), were used to transcribe the interview data. All the tracks were listened to critically in order to get an overall sense of what could be explored from the information gathered as well as other general views. It is estimated that it took 21 hours 55 minutes to listen to all the tracks and to type the information. The second step followed was to replay all seven tracks and to write down relevant data based on the aims of the study and any unexpected findings. All information gathered was typed on the transcripts. The information was replayed a few times when

typing a word, sentence or paragraph to ensure that exactly what was said was transcribed.

#### **4.5 Analysis and interpretation method**

Once the transcripts were completed, selected relevant raw data containing different opinions of the respondents was saved as a Microsoft Word file. In many cases it is believed that the challenge of an interview project lies in large transcripts of data, especially in the case of novice researchers or young scholars (Kvale & Brinkmann 2009:189-191). Kvale and Brinkmann (2009) explain in “the 1,000-page question” that novice researchers or young scholars tend to emphasise the quantity of qualitative data (transcripts) rather than the content and meaning. As a result, they find themselves in a situation where they do not know how to analyse the 1 000 pages of interview transcripts collected. In light of the above statement and as described under the transcript procedures, only important information gathered was transcribed, with the emphasis on content and meaning rather than on quantity. This was guided by, but not limited to, modes of interview analysis described by Kvale and Brinkmann (2009:201-240) and the tasks to consider when analysing texts as described by Hattingh (2005:138-141), namely observational and manipulative techniques.

Kvale and Brinkmann (2009:201-240) describe the following modes of interview analysis as tools which researchers can choose depending on the nature of their study:

(i) Analyses focusing on meaning

- Meaning coding
- Meaning condensation
- Meaning interpretation

(ii) Analyses focusing on language

- Linguistic analysis
- Conversation analysis



- Narrative analysis
- Discourse analysis
- Deconstruction

(iii) General analyses

- Bricolage
- Theoretical reading

The first two approaches to the analysis of interview texts overlap and can be seen as systematic analytic modes because they categorise information in sections according to language or meaning. While general analyses are self-explanatory, they include a mixture of modes of interview analysis which do not have a specific format; the first two approaches can also be included. Although all approaches are very important, the general analysis approach was chosen as it fitted the content and purpose of the inquiry. Interview analysis as bricolage refers to “the eclectic form of generating meaning through a multiplicity of ad hoc methods and conceptual approaches” (Kvale & Brinkmann 2009:233).

The eclectic form of generating meaning through a multiplicity of methods can also be identified in observational techniques and manipulative techniques outlined by Ryan and Bernard (2003, *in* Hattingh 2005:138-141). These techniques will not all be used by the researcher to code the data, but only where applicable.

#### **4.5.1 Themes and sub-themes**

The themes and sub-themes are believed by many researchers to be the base which guides the research inquiry (cf. Hattingh 2005:138; Kvale and Brinkmann 2009:191). The researcher usually develops themes and sub-themes through the conceptual and theoretical understanding of the subject studied. This is done by means of a number of research methods and techniques, for example the literature review, as well as the questionnaire

survey if the study involves mixed methods of inquiry, among others. It is impossible for the research inquiry to be developed to the stage of analysis and interpretation of data without any prior knowledge of the subject matter or foundation, as there will be no direction. Even though themes can be developed in advance, there will always be room for new themes to emerge because research is a process involving interviewer and respondent, which can be unpredictable (Hattingh 2005:139). Bearing in mind that new themes might emerge during the interview analyses, for the purpose of this study, themes have been identified and discussed in previous chapters, specifically from the results of the phase one questionnaire survey and the planning of the interview schedule. The aim that guided the formulation of the interview schedule was to confirm the results of the questionnaire survey and to gather more information on the following main goals:

- The reason why animation studio, production house and post-production houses regarded telling a story through performance as a more critical skill for entry level animators;
- The reason why computer animation software, character design, cinematography and editing skills scored the second highest on the critical skills required for entry level animators;
- The reason why the participants see creative skills as the more important in their selection process for junior computer animation positions;
- The reason why the participants say that institutions teaching computer animation should focus more on creative skills.
- Comments on the summary of the results of the questionnaire survey, on whether the nature of the company or the size of the company could determine which skill is considered more critical in the selection process for junior computer animation positions;
- Comments on whether students hoping to enter the South African animation industry should strive to become Jack of all trades first and specialise afterwards, or not.

#### 4.5.2 Sub-themes emerging from the transcript

The interviewer and the respondents discussed formulated sub-themes in the interview schedule. The following sub-themes emerged during the transcription process:

- First-world countries versus third-world countries;
- Teaching a technical person creativity is not easy;
- People entering the animation industry do not have adequate technical or creative skills;
- Telling a story through character performance

#### 4.5.3 Categorisation

All seven respondents were categorised with respect to concept and patterns confirming or refuting the results and how prevalent the views were among the respondents. The categories were used in an attempt to arrange transcripts coherently for data analysis purposes for the main interview schedule questions. Flowing from the categories for data analysis, it was decided that the respondents interviewed should be coded (Table 4.6) according to the two cities for the purpose of data analysis. The respondents listed under Table 4.6 will be randomly coded as they are discussed in the next chapter. The codes for each city will read as follows: Johannesburg: INJHB 1 (interview, Johannesburg, number of the interview) Cape Town: INCPT 1 (interview, Cape Town, number of the interview).

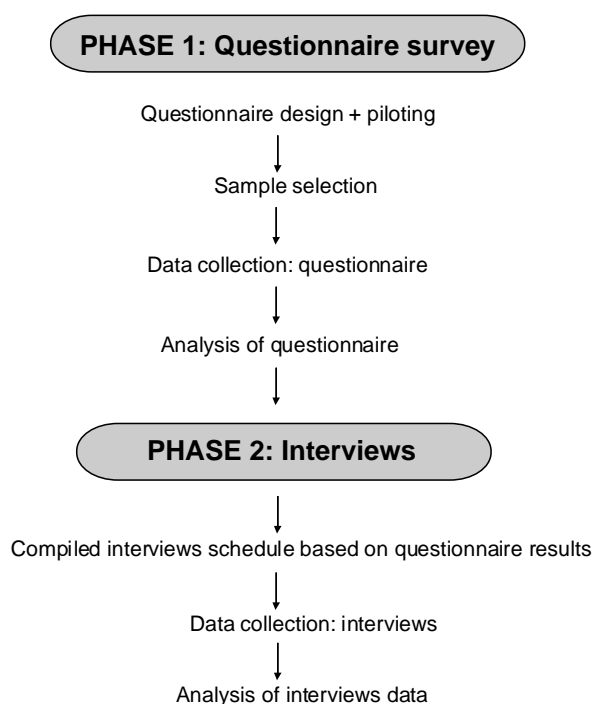
**Table 4.5:** Respondents as they were categorised by cities

JHB	CPT
Hans Sedgwick	Adrian Burger
Heidi Stohr	Gavin Coetzee
Jean du Plessis	Quentin Vogel
Rory Mark	

#### 4.6 Chapter summary

This chapter presented the methods and procedures followed in order to collect data regarding the practitioners' views in 13 South African companies. The study involved two phases: the application of a questionnaire survey and

interviews. This process can be described as a sequential mixed-methods (Tashakkori & Teddlie 1998:149) or a sequential explanatory design (Bergman 2008:69). Phase one of the questionnaire survey discussed the questionnaire design, formulation of questions and statements, sample selection, piloting of the questionnaire and data collection, while phase two of the interview survey discussed the interview schedule design, the population of the study, ethical considerations of the study, fieldwork, preparation of transcriptions, analysis and interpretation of raw data, and the reliability and validity of the questionnaire and the interviews (see Figure 4.1).



**Figure 4.1:** Basic overview of the methods and procedures followed

Relevant research methods and theories of technique (Babbie *et al.*'s 2001; Babbie & Mouton 1998; Bergman 2008; Hattingh 2005; Kvale & Brinkmann 2009; Olney & Barnes 2006; Struwig & Stead 2001; Tashakkori & Teddlie 1998; Vogt 2007) were consulted and guided the methods and procedures followed.

## **CHAPTER 5**

### **PRESENTATION OF RESULTS AND SUMMARY OF FINDINGS**

#### **5.1 Introduction**

This chapter reports on the questionnaire survey and the interviews conducted to investigate the views of animation directors, animators and lead animators/senior animators on critical skills required for entry level animators in computer-generated animation. One of the advantages of the use of the explanatory sequential mixed-methods approach is that the results of both phases can be presented sequentially in order to provide a clear structure (Creswell & Plano Clark 2007:74). Both questionnaire and interview responses will be discussed under the headings that correspond to the general objectives of the questionnaire and interviews. The questionnaire results will be presented and discussed in order to examine the findings and evaluate the research questions stated.

#### **5.2 Presentation of questionnaire results**

There is general agreement that a return rate of 50% of questionnaire surveys is considered average, and 70% is very good (Babbie & Mouton 1998:261). For this study, the response rate for the questionnaire survey component of the study was 58%. The questionnaire was distributed to a total of 24 companies, of which 14 companies involving 17 people participated. Eight other companies identified during the planning of data collection did not respond or were not interested in participating in the study, Two would have liked to participate, but were committed to productions which prevented participation. Out of 14 companies participating in the study, one was disqualified from the study because the questionnaire was completed by the executive officer. The 13 companies that participated voluntarily are listed in Table 5.1 below:

**Table 5.1:** The 13 companies that participated in the study

<b>Johannesburg</b>	<b>Cape Town</b>
Red Pepper	Trigger Fish
Master & Savant	Wicked Pixels
The Refinery	Supa Strika/Logic Illusion
Bug Box	Roof Top
Solid Black	Lung
Ministry of Illusion	RGB & Alpha
	Blink Tower

The complexity of quantitative data analysis is reflected in Alreck and Settle (2004). They suggest that a large amount of collected data needs to be summarised using sets of statistical tools. In addition, Alreck and Settle (2004:269-272) discuss three ways in which quantitative data can be presented, i.e. as frequency and percentage tables, percentage distributions and graphics data description. For the purpose of this study, frequency and percentage tables and graphics data description were used to summarise the results of the collected data. Interestingly enough, these tables and graphics are useful not only for summarising large amounts of data, but also make the process of interpretation of the findings simpler (Alreck and Settle 2004:272). The presentation of the data derived from the questionnaire results will be set out in a similar way to the questionnaire that was used to survey critical skills required for entry level animators in computer-generated animation (Annexure A). Microsoft Office Excel and Word were used to record the responses to each question under each responding company's name.

## **5.2.1 Results: Questionnaire statistics of the respondents**

### **5.2.1.1 Respondents by position**

According to the results of the respondents by positions, Table 5.2, eight animation directors and eight lead animators /senior animators participated, which representing a 50% participation rate for each position.

**Table 5.2:** Respondents by position in the company

<b>Positions</b>	<b>n</b>	<b>%</b>
Animation director	8	50
Lead animator/Senior Animator	8	50
<b>Total</b>	<b>16</b>	<b>100</b>

### 5.2.1.2 Respondents by the nature of the company

With reference to the results of respondents by the nature of the company, Table 5.3 shows that three participants from three post-production companies participated, which is a 23% participation rate. Five animation studios participated with seven participants, which is equal to a 38% participation rate. Five production houses participated with six participants, representing a 38% participation rate.

**Table 5.3:** Respondents by the nature of the company

<b>Nature of the company</b>	<b>n</b>	<b>%</b>
Animation studio	5	38
Post-production house ( <i>with an animation department</i> )	3	23
Production house ( <i>with an animation department</i> )	5	38
<b>Total</b>	<b>13</b>	<b>100</b>

### 5.2.1.3 Respondents by the main type of production

Animated TV commercials rated the highest, as the main type of production. Eleven participants rated 69% with regard to animated TV commercials (see Table 5.4). Only two participants with a participation rate of 13% indicated that their main type of production was animated feature-length film/ short animated film. Three (19%) of the other participants indicated their main type of production as “other”, including web animation and TV graphics.

**Table 5.4:** Respondents by the main type of production

Main type of production	n	%
Animated TV commercials	11	69
Animated Music Videos	0	0
Animated TV series	0	0
Animated Internet series	0	0
Character animation for game development	0	0
Animated feature-length film/ short animated film	2	13
Other, specify	3	19
<b>Total</b>	<b>16</b>	<b>100</b>

#### 5.2.1.4 Respondents by company size

With regard to the results of respondents by company size, Table 5.5 shows that, of those companies with fewer than five employees, only four small companies participated, which is equal to 25% participation. In the case of companies with 6–20 employees, eight companies participated, which equals 50% participation, and in the case of companies with more than 20 employees, four participated, with a rate of 25%.

**Table 5.5:** Respondents by company size

Company size	n	%
Small company (fewer than 5 employees)	4	25
Medium-sized company (6-20 employees)	8	50
Large company (+100 employees)	4	25
<b>Total</b>	<b>16</b>	<b>100</b>

#### 5.2.1.5 Responses to the question: what critical skills does your company look for in new animators?

Among the participating companies, question I rated the highest score on the critical skills required for new animators, with 69% indicating level 5 as the level of preference and 19% choosing level 4. Question B rated second highest, with 38% choosing level 5 as the level of preference, while 31% chose level 4 and 25% level 3. Questions C, G, H, K and L scored 31% for



level 5 (see Tables 5.6–5.17). Comments indicated that new animators were required to have other skills, but that the ability to tell a story through character performance (acting techniques for bringing an animated character to life, principles of animation) was more critical.

**Table 5.6:** (a) Good storytelling skills (*story development, scriptwriting, storytelling techniques*).

<b>Question A:</b> Good storytelling skills (story development, scriptwriting, storytelling techniques).		
Score	n	%
1	1	6
2	5	31
3	3	19
4	4	25
5	3	19
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 5.7:** (b) Good character design skills (*cartoon characters, stylised characters, realistic character, personality of a character, appeal, drawing, anatomy*).

<b>Question B:</b> Good character design skills (cartoon characters, stylised characters, realistic character, personality of a character, appeal, drawing, anatomy).		
Score	n	%
1	0	0
2	1	6
3	4	25
4	5	31
5	6	38
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 5.8:** (c) Good visual and look development skills (*storyboarding, overall styling and the visual atmosphere; i.e. colour keys, environment designs and props*).

<b>Question c:</b> Good visual and look development skills ( <i>storyboarding, overall styling and the visual atmosphere; i.e. colour keys, environment designs and props</i> ).		
Score	n	%
1	0	0
2	4	25
3	2	13
4	5	31
5	5	31
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 5.9:** (d) Good at production strategies (*planning the production flow, defining creative goal, budget and scheduling*).

<b>Question D:</b> Good at production strategies ( <i>planning the production flow, defining creative goal, budget and scheduling</i> ).		
Score	n	%
1	6	38
2	3	19
3	2	13
4	3	19
5	2	13
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 5.10:** (e) The historical development of the technical animation production processes.

<b>Question E:</b> The historical development of the technical animation production processes.		
Score	n	%
1	7	44
2	3	19
3	3	19
4	3	19
5	0	0
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 5.11:** (f) The historical development of computer animation techniques and styles.

<b>Question F:</b> The historical development of computer animation techniques and styles.		
Score	n	%
1	7	44
2	3	19
3	4	25
4	1	6
5	1	6
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 5.12:** (g) Advanced skills in computer modelling techniques (*curved lines, geometric primitives, sweeping, free-form objects, free-form curved surfaces, subdivision surfaces, logical operators and trimmed surfaces, photogrammetry and image-based modelling*).

<b>Question G:</b> Advanced skills in computer modelling techniques ( <i>curved lines, geometric primitives, sweeping, free-form objects, free-form curved surfaces, subdivision surfaces, logical operators and trimmed surfaces, photogrammetry and image-based modelling</i> ).		
Score	n	%
1	1	6
2	3	19
3	2	13
4	5	31
5	5	31
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 5.13:** (h) Advanced skills in computer rendering techniques (*Hardware rendering, non-photorealistic rendering, image-based lighting, global illumination and radiosity, ray tracing, Z-buffer, lights, camera and materials*).

<b>Question H:</b> Advanced skills in computer rendering techniques ( <i>Hardware rendering, non-photorealistic rendering, image-based lighting, global illumination and radiosity, ray tracing, Z-buffer, lights, camera and materials</i> ).		
Score	n	%
1	2	13
2	0	0
3	4	25
4	5	31
5	5	31
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 5.14:** (i) Advanced skills in telling a story through character performance (*acting techniques for bringing an animated character to life, principles of animation*).

<b>Question I:</b> Advanced skills in telling a story through character performance ( <i>acting techniques for bringing an animated character to life, principles of animation</i> ).		
Score	n	%
1	1	6
2	0	0
3	1	6
4	3	19
5	11	69
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 5.15:** (j) Good editing skills (*sequencing and compositing*).

<b>Question J:</b> Good editing skills ( <i>sequencing and compositing</i> ).		
Score	n	%
1	2	13
2	3	19
3	5	31
4	3	19
5	3	19
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 5.16:** (k) Good cinematic techniques (*camera techniques, camera shots, camera lenses*).

<b>Question K:</b> Good cinematic techniques ( <i>camera techniques, camera shots, camera lenses</i> ).		
Score	n	%
1	1	6
2	1	6
3	7	44
4	2	13
5	5	31
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 5.17:** (l) Advanced skills in animation computer software (*such as Maya/Studio Max/Light wave/After Effects/CAD/Final Cut/ Avid/Premiere*).

<b>Question L:</b> Advanced skills in animation computer software ( <i>such as Maya/Studio Max/Light wave/After Effects/CAD/Final Cut/ Avid/Premiere</i> ).		
Score	n	%
1	0	0
2	3	19
3	3	19
4	5	31
5	5	31
<b>Total</b>	<b>16</b>	<b>100</b>

**Selected comments:**

- For "E" and "F", although we feel that history is important, it isn't always relevant to getting a job done. We instead look at "C", where creating inspired and modern visuals are the focus. This brings us to "I". Convincing someone that your character is alive, we believe, is of utmost importance for any character-driven story.
- Please note that I am answering as a Specialist Character Animator(not a 3D generalist– which most people just call "animator"). I – animation character performance animation isn't really being taught in animation schools in SA, and being able to act through the character is rare in SA.
- Animators in the feature film industry would be more specialised in character performance animation than an animator/generalist in the commercial industry.
- The biggest thing I look for in a prospective animator is knowledge and practice of the animation principles (I) – they need to know them, love them and use them.
- The importance of all these skills depends on the area in animation the applicant is applying for; if they want to be character animators, then acting and storytelling skills are important; if they are more interested in the technical side of the animation industry, then modelling, and rendering skills are important.
- So all of these are important, and all of them affect one another.

**5.2.1.6 Responses to the question: Does your company encourage specialisation from its employees in either technical or creative skills?**

A total of twelve participants with a rating of 75% showed that their companies encouraged employees to have both technical and creative skills (see Table 5.18). On the other hand, 19% of the participants indicated that they encouraged creative skills rather than technical skills. Only 6% of the participants encouraged technical skills.

**Table 5.18:** Responses to the question: Does your company encourage specialisation from its employees in either technical or creative skills?

Does your company encourage specialisation from its employees in either technical or creative skills?	n	%
Technical skills	1	6
Creative skills	3	19
Both technical and creative skills	12	75
<b>Total</b>	<b>16</b>	<b>100</b>

#### 5.2.1.7 How do technical skills and creative skills relate to each other in computer animation productions?

##### Selected comments:

- They work hand in hand. Both skills serve each other in an animation production. For example, a person with the role of the art direction will design the visual look of the production, the character animator will bring the character to life through performance [and] technical directors, visual effects artists, editors, will assemble, texture, shade, light and render the animated sequences.
- All animators need good technical skills in order to understand the program they work in. However it is essential to be creative. If you are creative and have a clear concept of animation you are going to create; half of the work is already done.
- They work together 50/50. In South Africa specialisation is not common because of the size of the industry. Most of the 3D artists need to be good in all aspects of 3D animation
- Technical skills will always be important and are the tool to unleashing one's creativity. If you can harness technical skills, your creativity won't be limited to what you're able to do. Being able to visualise something special first and then being able to execute it, is where these two skills converge.
- I would use the analogy of a painter, who is creative in the art form of painting, visualising, conceptualising, and technically skilled in how he

uses his tools (brush, paint and colour mixing and canvas) to bring his art to life. So too, the animator needs to master the tools he/she uses to create the art of animation.

- From experience we find that students in South Africa are below par both in creative and technical areas. I am a firm believer that you can teach an artist how to use an animation package but it doesn't seem to work the other way round.
- Creative takes higher preference, always. You can teach creative technical skills, but it is very difficult to teach a technical [person] creative skills.

#### **5.2.1.8 Responses to the statement: Usually, junior computer animators' working context requires executing creative ideas developed by others.**

Respondents' views on the statement that usually, junior computer animators' working context requires executing creative ideas by others indicated that 38% agreed with the statement and 19% agreed strongly (Table 5.19). Altogether, 25% disagreed with the statement and none strongly disagreed. Only 19% were undecided on this view. Comments by the participants indicated that both junior and senior animators were equally important in generating concepts or ideas. However, the reality of the animation industry is that junior animators always work under the supervision of the lead/senior animator throughout the production process.

**Table 5.19:** Responses to the statement: Usually, junior computer animators' working context requires executing creative ideas developed by others.

Statement: Usually, junior computer animators' working context requires executing creative ideas developed by others.	n	%
Strongly agree	3	19
Agree	6	38
Disagree	4	25
Strongly disagree	0	0
Undecided	3	19
Total	16	100



### **Selected comments**

- This is true in part, but this does not mean that they're not allowed to apply their own creative input if it improves the work. Having initiative can go a long way to showing your capabilities and line you up for bigger things.
- That is not always the case in my experience. I think junior animators might have less experience than seniors, but are equally valuable when it comes to creative ideas.
- Well, I would imagine that 90% of the time the junior computer animators hired are filtered into a standing production team and pipeline that has more senior animators to drive the production forward.
- It is the way the industry works. An animator's job is to bring ideas to life, no matter whose ideas they are.
- Yes and no; they can work on concepts that are already in development. On the other hand, everyone at Blink Tower contributes to writing, storyboarding and concepts – including the secretary, the managing director, etc.
- I agree because the animator will be taking direction from the director. It is the director's vision we are trying to create. However, some directors give their animators the freedom to come up with their own ideas. They present the idea to the director, he may make changes to improve it, or approve it and give them the go to start animating.
- Junior animators should bring some sort of creativity to the table. Just because they are junior, doesn't mean they are not creative. Usually decisions with regard to the assignments they are working on are discussed in a team environment where even more ideas can come forward. This is where storyboarding and script development really come in handy.
- In a commercial environment this is the case anyway; all decisions filter down from agency – through the lead and on to the junior.

#### 5.2.1.9 Responses to the question: Are technical skills (computer use) or creative skills (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company?

Participants' views on this question leaned towards creative skills being more important (Table 5.13). With regard to technical skills, the highest level of preference (5) was recorded at 19%, while for creative skills this level was at 56%. Level 4 for technical skills registered 25% and creative skills 31%. Level 3 for technical skills was chosen by 38% and for creative skills by 13%. Nineteen percent chose level 2 for technical skills, while no respondent (0%) chose this level for creative skills. No respondents (0%) chose level 1 for either technical or creative skills.

**Table 5.20:** Question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company?

Question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company? (Please indicate your score. 1 is the lowest score and 5 is the highest score for each option.)					
Technical skills			Creative skills		
Score	n	%	Score		%
1	0	0	1	0	0
2	3	19	2	0	0
3	6	38	3	2	13
4	4	25	4	5	31
5	3	19	5	9	56
<b>Total</b>	<b>16</b>	<b>100</b>	<b>Total</b>	<b>16</b>	<b>100</b>

#### Selected comments

- Technical skills (Computer use) are in my opinion more important, because we use the software as a tool to create. Creative skills (Conceptual) are still very important because that is where the ideas are birthed from.

- Technical skills can be taught on the job. I don't care if you can work in Max, or Maya, or Xsi, or whatever it is you were taught in. If you aren't creative, I cannot expect you to bring a character to life in a believable sense.
- Depends on the position you are applying for. We need both to fulfil the clients' needs.
- Technical skills can always be caught up/taught, real creative skill not. The truth is any studio is a combination of people anyway. We hire to complement skills.
- As mentioned earlier, technical skills can be learnt, but the junior must be capable of using the application so there is no time-wasting in learning fundamentals. Creative skills must definitely be present. These skills can still be grown and focused, allowing the employee to mature his/her own creative style over time
- It takes much longer to teach creativity, but some just have it naturally. Technicalities could be taught with tutorials.
- In my opinion anyone can learn to operate a computer, but not everyone can be artistic. Like I mentioned before. Character Animators are actors, and that is what I would rather look for than technical brilliance.
- Must have both to be well balanced (relative to our commercials industry).
- As mentioned previously "Creative takes higher preference, always. You can teach [a]creative [person] technical skills, but it is very difficult to teach [a]technical [person] creative skills."

**5.2.1.10 Responses to the question: In your opinion and from your experience, should institutions teaching computer animation focus more on technical or creative skills?**

Of the respondents on the highest level of preference (5) 56% thought that institutions teaching computer animation should focus more on creative skills,

whereas 31% thought that the focus should be more on technical skills (Table 5.14). Thirty one percent of respondents chose level 4 to indicate the importance of the teaching of creative skills while only 6% of the respondents chose this level of importance for the teaching of technical skills. Technical skills scored 56% on the third level of preference and creative skills 13%.

**Table 5.21:** Responses to the question: In your opinion and from your experience, should institutions teaching computer animation focus more on technical or creative skills?

<b>Question: In your opinion and from your experience, should institutions teaching computer animation focus more on technical or creative skills? (Please indicate your score. 1 is the lowest score and 5 is the highest score for each option.)</b>					
<b>Technical skills</b>			<b>Creative skills</b>		
Score	n	%	Score	n	%
1	0	0	1	0	0
2	1	6	2	0	0
3	9	56	3	2	13
4	1	6	4	5	31
5	5	31	5	9	56
<b>Total</b>	<b>16</b>	<b>100</b>	<b>Total</b>	<b>16</b>	<b>100</b>

### **Selected comments**

- This actually depends on what the school wants to teach. If you're a school that wants to have Rigging TDs as their primary graduate, then focus more on the technical side. If you're a school that prides itself on creatives, who can image and animate anything to life, then of course more focus on the creative side. For schools having generalists, both are equally important and personally I think both are equally important to teach. In that way a student is exposed to more and he/she can make their own decision on what to focus on.
- In terms of teaching, there would probably be more to teach technically to an already creative person that would then broaden their focus on how to express their creativity.

- This has been a debate for years. But in my opinion if a school calls itself an animation school then their responsibility is to teach animation and not just software. Out of my own experience, a lot of time was dedicated in teaching the technical but not animation.
- All aspects should be treated as equally important in becoming a world class animator.
- The sheer number of applicants we receive who don't know what "squash and stretch", "anticipation" or "animate on 2's" means in an animation context is staggering. Sure, they can make some great high-res photo-realistic-lighting sub-surface-scattered doodads in Maya, but do they know how to animate a walk cycle properly, or how to troubleshoot a lifeless animation? Very rarely. The technicalities behind the software and the company's processes can be dealt with later, given the right creative, passionate people.
- In my opinion, the biggest problem is that the schools are too focussed on software literacy, and don't focus on either of these things. Artistic skills are about learning principles, technical skills are about solving problems. Both of these need to be urgently addressed.
- In South Africa we don't have many studios where animators can become specialists. Usually a generalist is required. So obviously some technical skills are needed. But you also need that creative vision to truly bring your ideas out on screen. Be it stylised, or realism.
- It is important to deliver creative people into the market but they also need good technical skills in all the programs they might work in, example: Photoshop, After Effects and Maya.
- They should be able to focus on both, offering courses for technical directors and animation directors. Students should be able to choose their paths.

**5.2.1.11 Responses to the question: What advice would you give to students hoping to enter the South African animation industry regarding their choice of skills acquisition?**

**Selected comments**

- Don't limit yourself to learning one skill even if it has always been your dream. Try everything; you may be surprised to find what your niche is
- Visit a few companies, promote your work, try and get an internship at a company and get a feel for the industry; from there you can decide what you want to specialise in, if you get the chance because at the moment it's quite rare in SA.
- If you want to specialise in Character Animation then you need to learn acting and performance, as well as the animation principles. If you want to be a generalist (Commercial Animation) then you will require technical skill as well. And it will help showing it in your reel as well.
- Work harder than anyone else at being the best. Have a very good show reel.
- Animation principles! Worship at the altar of Richard Williams. Draw, draw, draw – animate by hand, on a lightbox, to really experience what makes animation magical. Do some stop-motion, painstaking as it is. These traditional techniques have a hugely beneficial effect on your computer animation skill. Study emotion, character, story and cinema.
- You should understand the entire process, become a jack of all trades, but if you really want to work for a big feature studio become a specialist.

**5.2.1.12 Responses to the question: Do you have any general comment with regard to the critical skills required in computer-generated animation?**

- Be absolutely sure that this is the career for you; it is full of late nights and work over weekends! If this is your passion, you will find it rewarding but be aware that you need to start at the bottom and work

your way up. Because this is a relatively small industry in SA, learn as much as possible from as many people as possible.

- Do not fall behind with techniques that are used in the industry, some techniques will save you time and give you a better result. Study the masters of animation cause they have lots to teach.
- In South Africa try and know as much as you can of every department, but know your stuff well in one or two departments. Stay up-to-date on what's happening in the world regarding films, latest CG effects, techniques and what other artists are doing and have achieved. The internet is an amazing source of information.
- Animation takes a lifetime to master, so one should [not] get discouraged when you don't get it right in your junior stages. Learn the principles and understand what it means to bring a character to life vs. moving controllers around. Learn acting and comic timing.

### **5.3 Summary of questionnaire results**

The response rate for the questionnaire survey component of the study was 58%. The questionnaire was distributed to a total of 24 companies, of which only 13 companies involving 16 people participated. The results suggested the following:

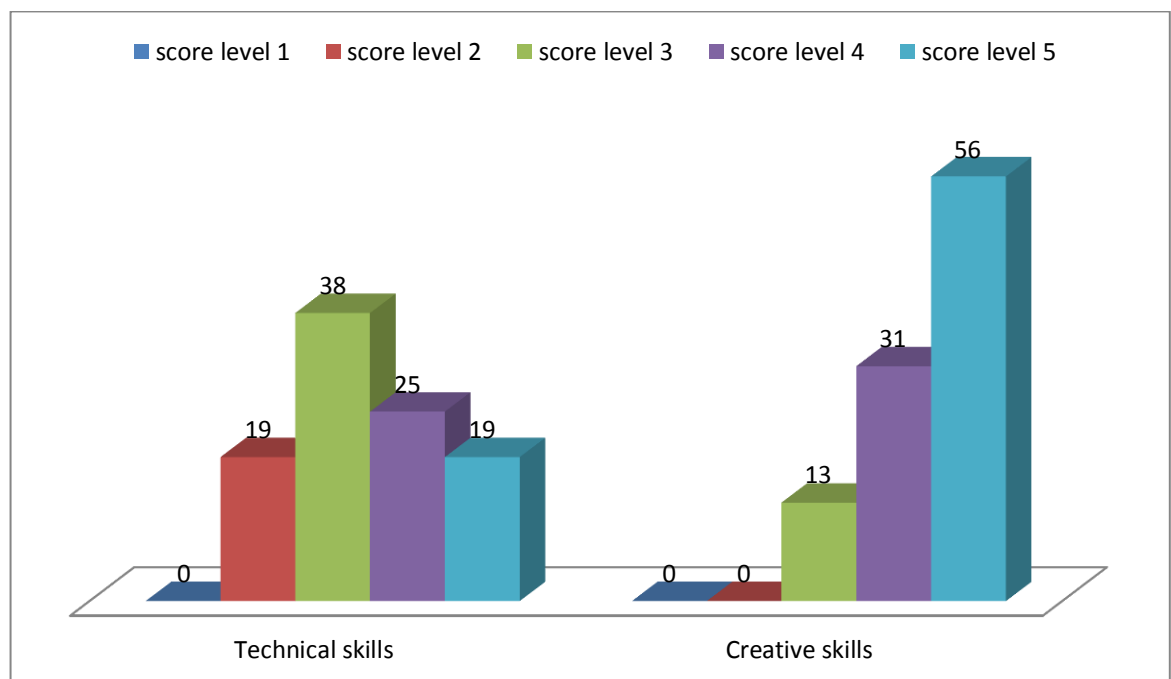
- There was a high level of agreement with the importance of having advanced skills in telling a story through character performance (*acting techniques for bringing an animated character to life, principles of animation*) as more critical for entry level animators. Other skills were considered equally important for two types of animator: the character animator and the generalist.
- Of the respondents, 75% indicated that their companies encouraged employees to have both technical and creative skills.
- Comments on how technical skills relate to creative skills suggested that the relationship between technical and creative skills could be seen from two perspectives: in a collaboration production and an individual

production. Both skills serve each other in both collaboration and individual productions in order to tell a visual story successfully.

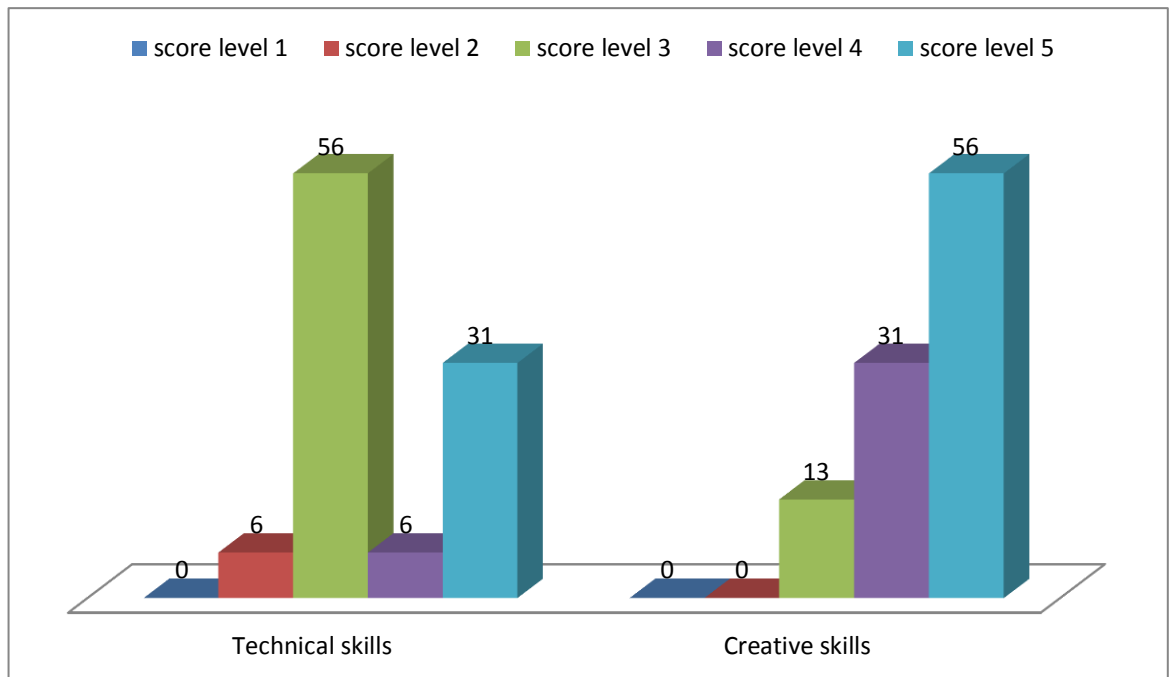
- Respondents to the question on whether technical skills (computer use) or creative skills (conceptual skills) were considered more critical in the selection process for junior computer animation positions in the company, indicated that creative skills were considered more critical than technical skills (see figure 5.1). They shared the view that computer technical skills can be learned through tutorials, while creative skills take a longer time to master.
- In response to the question on whether their experience showed that institutions teaching computer animation should focus more on technical or creative skills, 56% thought that teaching institutions should focus more on creative skills, and gave this the highest level(5) of preference (see figure 5.2). However, there is a view that institutions should focus on both skills in order to give students opportunities to choose their own career paths.
- It became clear that the respondents believed that, when choosing which skills to acquire, students hoping to enter the South African animation industry should become generalists first and specialise immediately after identifying their areas of strength. In addition, they should know, understand and apply the principles of animation.
- The results of the replies of the animation studios and production houses to the question about whether technical or creative skills were preferred in the company's selection process revealed that creative skills were given a higher preference to technical skills (see figures 5.3 and 5.5).
- Post-production houses (with animation department) indicated that both technical and creative skills were equally important (see figure 5.4) on the question (5.2.1.9) of whether creative or technical skills were more important in the company's selection process..



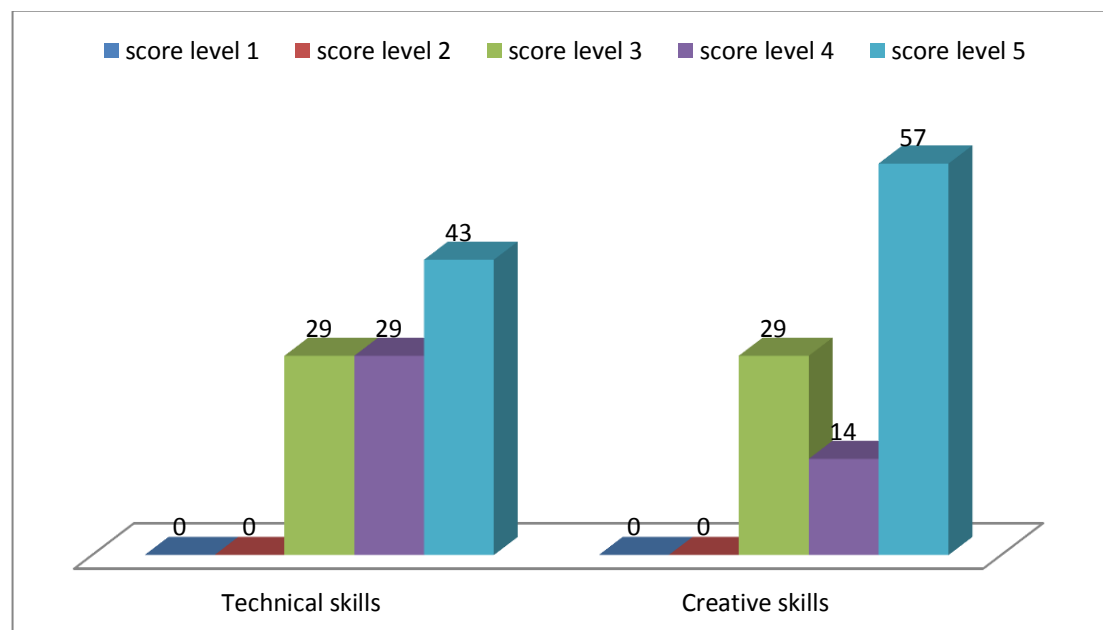
- Companies where the main type of production was animated feature films, animated TV commercials and other, believed that creative skills were more critical, in the question (5.2.1.9) on the relative importance of creative or technical skills in their selection processes (see figures 5.6, 5.7 and 5.8).
- Small companies' responses to the question on the relative importance of creative or technical skills (5.2.1.9) illustrated that technical skills were considered more important (see figure 5.9).
- Responses by medium-sized and larger companies to the question of the relative importance of creative and technical skills in their selection processes (5.2.1.9) indicated that they considered creative skills more important (see figures 5.10–5.11).



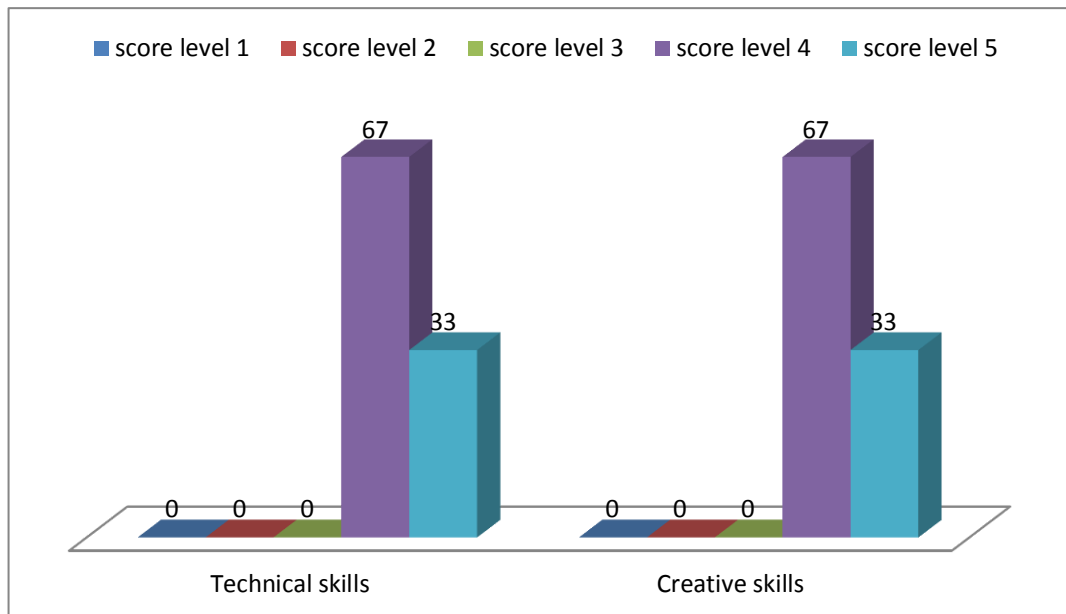
**Figure 5.1:** Summary of responses to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



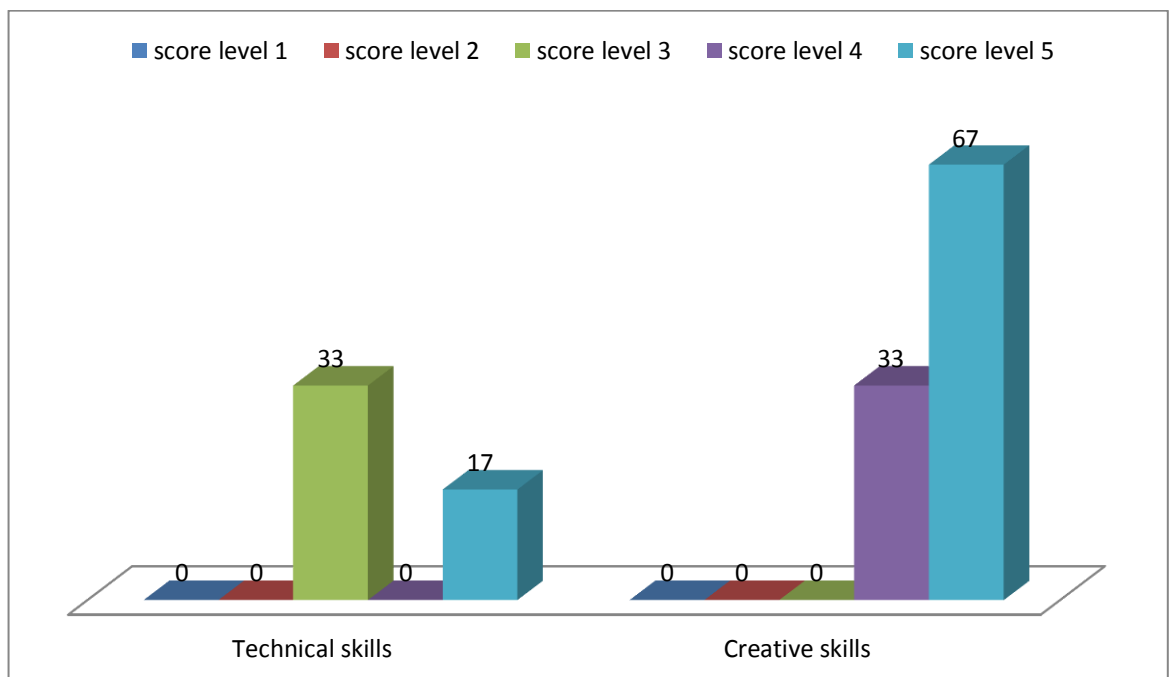
**Figure 5.2:** Responses to the question: In your opinion and from your experience, should institutions teaching computer animation focus more on technical or on creative skills?



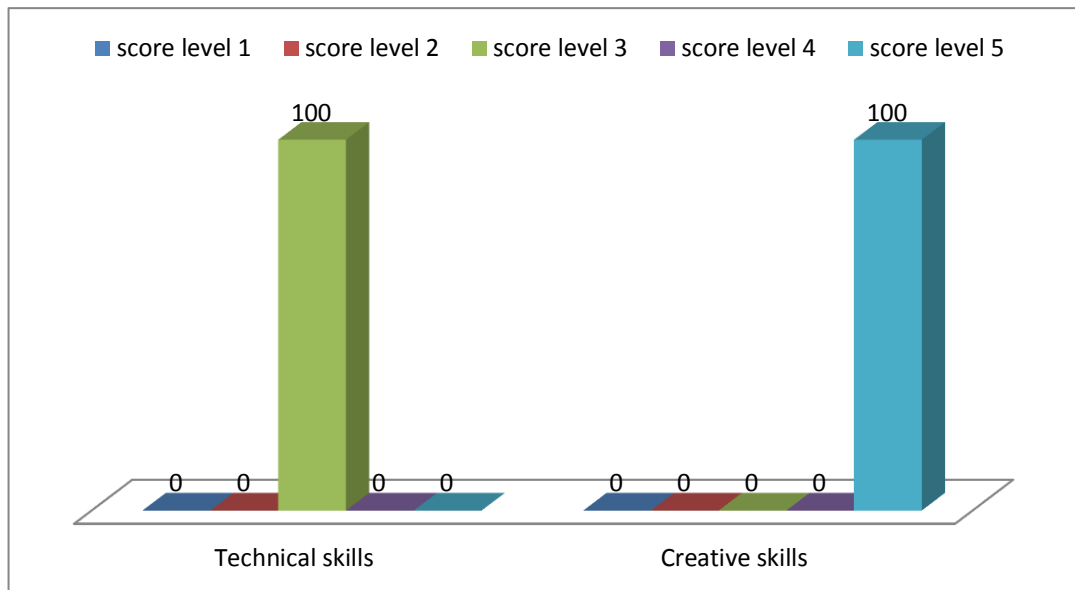
**Figure 5.3:** Responses of the animation studios to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



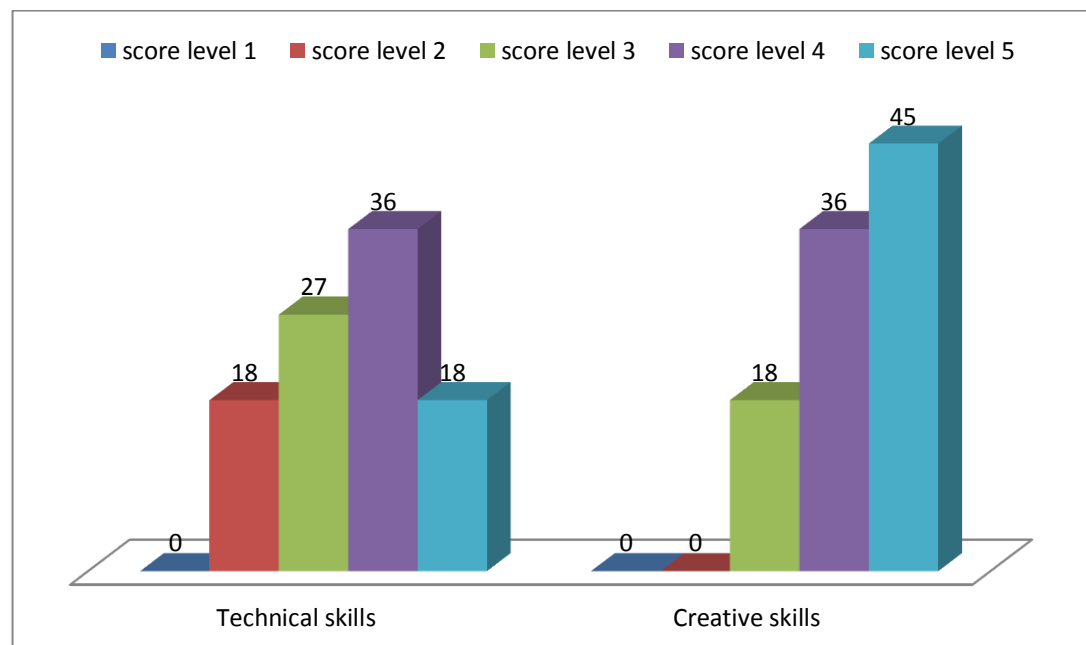
**Figure 5.4:** Responses of the post-production houses (with animation department) to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



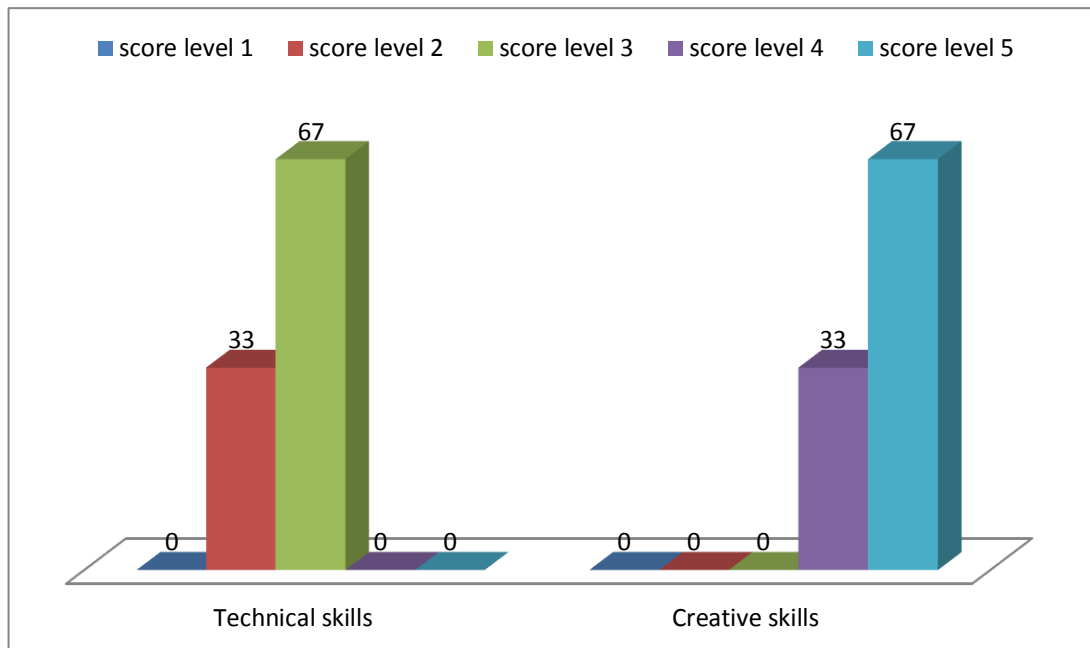
**Figure 5.5:** Responses of the production houses (with animation department) to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



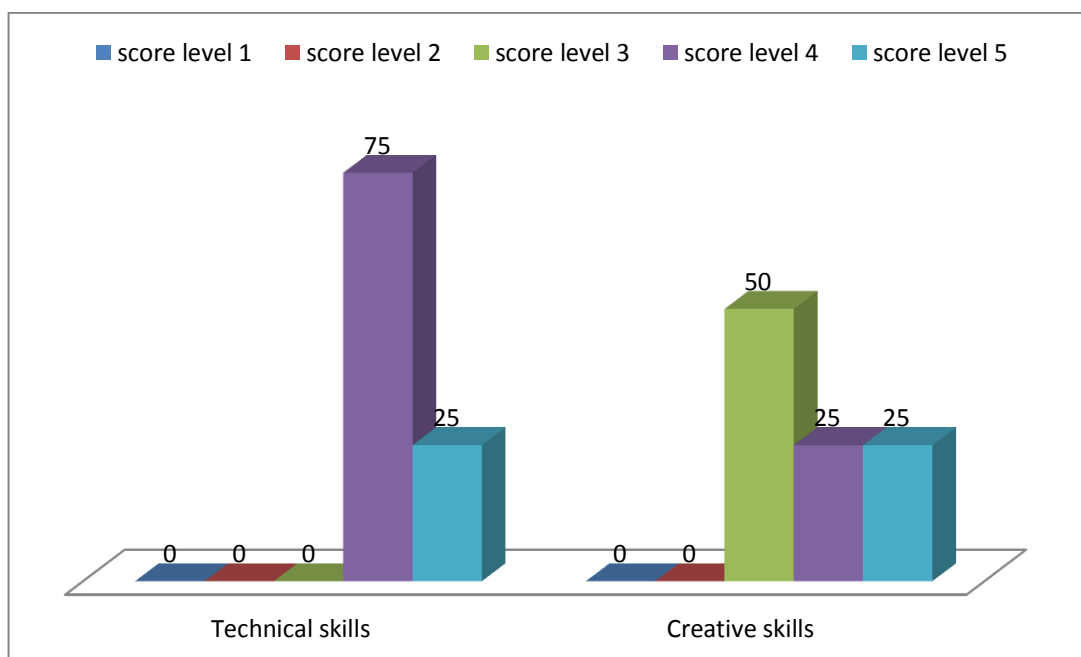
**Figure 5.6:** Responses of companies with animated feature films as the main type of production to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



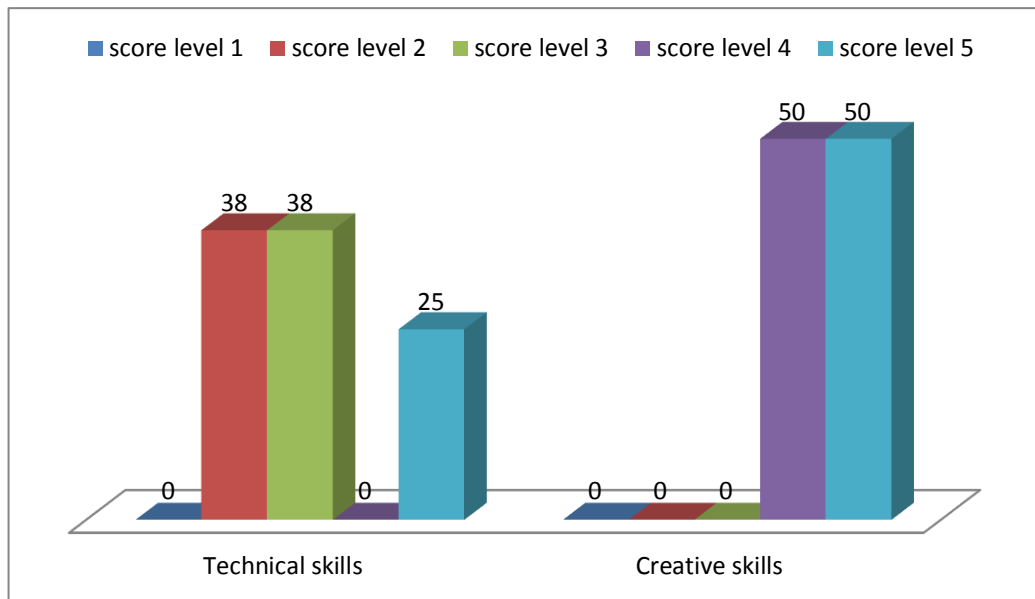
**Figure 5.7:** Responses of companies with animated TV commercials as the main type of production to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



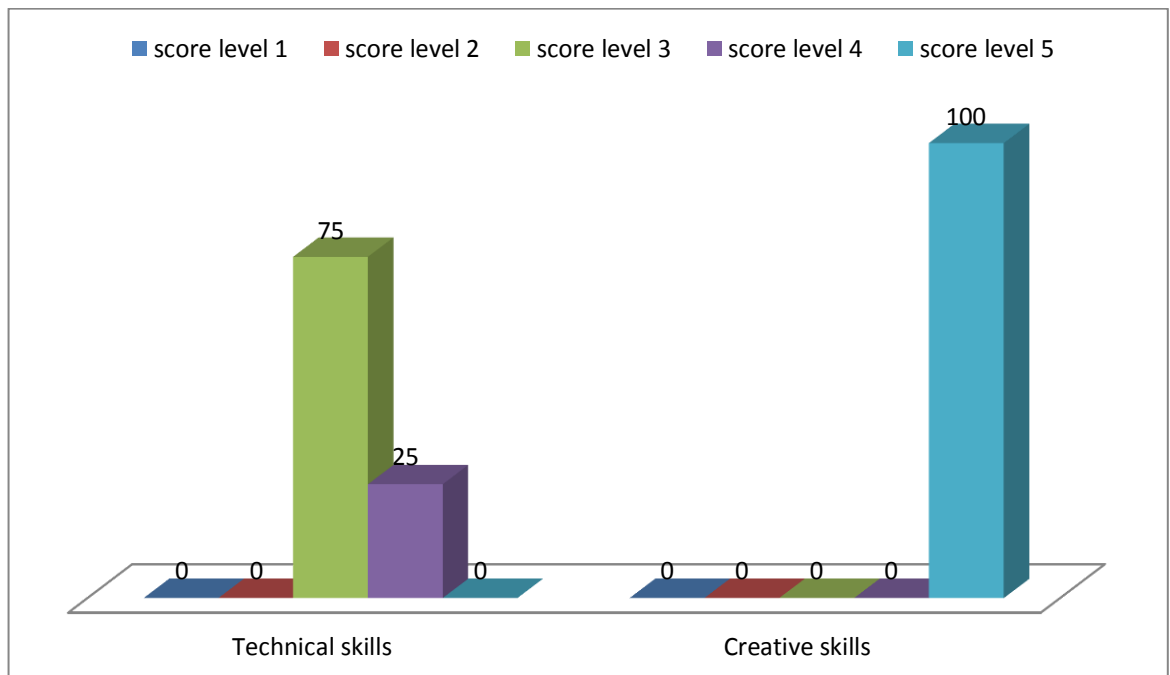
**Figure 5.8:** Responses by companies specifying “other” as the main type of production to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



**Figure 5.9:** Responses by the size of the company (small companies) to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



**Figure 5.10:** Responses by the size of the company (medium-sized companies) to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



**Figure 5.11:** Responses by the size of the company (large companies) to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?

## **5.4 Analysis of interview data**

Boeije (2010:150) explains how data analysis differs between quantitative and qualitative research. He argues that in quantitative research findings are discussed in numbers only, while in qualitative research, it is the interpretation of the findings by the researcher that constitutes the results. One way or another, mistakes can always hinder the reliability and validity of the findings in the process of interpretation. In an attempt not to lose track and to avoid generalisations, the interpretation of the findings was guided by the research questions. The presentation of the data derived from the interview results will be set out in a similar way to the interview schedule used to gather information for this study (Annexure D). The selected quotes from respondents are also presented verbatim in this section.

### **A) The reason why animation studios, production houses and post-production houses regarded telling a story through character performance as more critical for entry level animators**

#### **A1) Findings**

All the participants shared a common view that the reason why the companies regarded telling a story through character performance as more critical for entry level animators was that the character needs to communicate a message or to tell a story. The message could be the simple communication of an idea through animation in commercials or in the telling of a story in feature-length film productions. **INJHB 4** gave an example of bringing life or character into a simple ball or sphere as the best explanation of why the companies regarded telling a story through performance as more critical. In support of this view, **INCPT 3** also agreed that it was because the main aim is to tell a story. Lastly, **INJHB 1** expressed his strongly-held view that no matter what form the animated character or object takes, in film or advertising the bottom line is that the character must convey the message.

It is in this context that four participants disagreed with the view that creativity is limited to the creative department or creative team. **INJHB 1**, **INJHB2**,

**INCPT 1** and **INCPT 3** defended their opinion based on the view that production teams, including animators, played an important role in the creative process. Their reasoning was that the role of the animator is to bring original and unique ideas for creative character performance in animation. Three participants agreed with the above-mentioned view, but **INJHB 3** was quick to remind us that it depended on whether the company could afford to have those divisions. **INCPT 1** and **INCPT 3** explained their first-hand experience of this issue. **INCPT 3** argued that because they are a small company they do not have such teams and their duties overlap. So it is obvious that whether creativity is limited to a creative department or a creative team depends on two things: the ability to put forward creative ideas in character performance, and the divisions within a company. Subsequently this led to the question: if the main skill for entry level animators is telling a story through character performance and if the animation productions are usually divided into teams, then what is the meaning of “creativity in telling story through character performance”?

All the participants indicated how difficult it was to explain what is meant by “creativity in telling a story through character performance”. The results showed a common consensus on the fact that creativity in telling a story through character performance is about creating a unique character performance. **INCPT 1** and **INCPT 3** mentioned Charlie Chaplin’s performance in the silent film era as a good example of creativity in telling a story through character performance. **INJHB 2** indicated that the best way to see creativity in telling a story through character performance is through unexpected actions and reactions by the animated character or by surprise effects. In addition, **INCPT 1**, **INCPT 3**, and **INJHB 4** believed that the ability to tell a story through actions and reactions without dialogue by the animated characters could also be seen as creativity in telling a story through character performance.



## **A2) Selected quotes**

### **INJHB 1:**

- It does not matter if you are making a film or you are in the Ad industry, we try to convey a message and so you've got to get the character to convey the message in the clearest possible way.
- No! I don't think so, I think production teams play a quite big role in the creative process, because it's a process you've got to come up with ideas like if you are an animator you come up with ideas of performance, you've got to decide how....what makes a good animator. A good animator is you've got to come up with original ways of presenting ideas or something. That is something you know, something that is interesting, original, you know...you got to bring a lot of yourself into performance.
- You are basically an actor, so you know that is creative, you got to develop a persona for that character because that character is just a polygon, basically.

### **INJHB 2:**

- People love to listen to stories, so if you don't convey that then you've just got an animation with an actor and there is no emotions; there is no way that you can connect with your audience because ultimately what you are trying to do is to communicate something.
- I ... think that creativity is not just limited to the creative execution team, I think ...[a] majority of people will assume that creativity is going to be part of the team that creates elements and does all that kind [of work]... I would encourage anyone who wants to work for us to have a creative mind-set and challenging any kind of problems that come on a day-to-day basis.
- I would say that going about it in a way that is unique, essentially having...creativity in performance is...looking at it and maybe spinning [the] head, portraying the moment in a way that maybe people will not

expect and that surprises... Ooh! Wow! Look at the, that is really good, I never expected that, then you show a creative spin in that.

### **INJHB 3:**

- I think what is also important to bear in mind when you are doing this is that a lot of the time we don't deal with storytelling animation as much as we deal with a simple communication of an idea through animation...critical idea in a commercial for instance. Communication skill; that's critical skill. You only have a [limited] amount of time to make that point, that critical communication. You are actually right, the performance to tell that story, which is only one point, still has to be very good, so the performance has to be clear and distinct and convey that idea in a short space of time.
- That is right, but again ...those studios [can] afford to have those kind of clear lines of division between creative production and management, many departments that...all blur into one, except maybe for the management side of it, but the creative and production are very closely linked.
- It is a difficult question...I guess the creativity in storytelling for me will be more to be able to create unique characters in that sense where we have characters that you can relate to, characters that make us laugh, characters you can identify with...it is quite a difficult question because I think animation in its own nature is creative, it's a difficult thing because you have to be creative for the animation performance to work well in order to tell a story well...I think any animator has to bring a certain amount of creativity to the whole process anyway, either designing the character or the actual animation.

### **INJHB 4:**

- Well, if you take a simple ball and you animate the simple ball or the sphere you still have to get a character out of that. That is animation and that is not [a] very technical thing, but you need a character, you cannot do that without performance, that's why I said that.

- I mean that's very similar to the ball thing. That is a creative thing, it's a study of our mannerisms... to give a simple thing a character or life or give little animation character. I don't know if you have seen [the] Puss in Boots movie. There are two cats, both want to go and steal the beans and the whole thing is not dialogue-driven, they [are] just basically chatting to each other with mannerisms.

#### **INCPT 1:**

- Well, from my background, I've worked a lot on narrative-based productions, so every little thing you do, especially now if you're [in the] long film industry you pretty much [move] from a character to a shot, to a scene, to the whole film. It's all about the story.... like animators have little teams and the way we work is you bring out...this little story we have to tell in this scene for the whole film, so they go out and pitch, so they go and sit, like draw out thumbnails, they act it out, you know so that's where it's critical to have a good sense of storytelling because now you pitch back to the director, animation director...sometimes we find [this] lacking in the guys who don't act it out,[They] are the ones [who] struggle the most. That's where it's really important to have a strong sense of acting and performance.
- No, I think in some cases, some studios' animators, especially juniors, don't have a lot of say, because it depends on the production...production house, commercially, like you are in a quick turnaround of productions so you have a commercial that you only have [a]certain amount of people working on...and then you have your creative directors and those guys usually have the say...in Triggerfish we have juniors pitching, like I said, pitching ideas to the director; the director is open to the suggestions, we have everybody in the team having an input, pitching his own ideas, drawing out thumbnails, pitched to the director.
- I think creativity in telling a story through character performance is more like, if you think about acting, it's about the art of performance

and telling the story through your character... it's about more like miming skills, so if you have comic timing and you can tell a story but just with one character you know, expressing and telling a story through his body... that is Charlie Chaplin you know,...if you think about it...

**INCPT 3:**

- Because the aim is to tell a story...performance without dialogue; a good example can be seen in silent movies, Charlie Chaplin, as well as Wallace and Gromit of the Aardman studio.
- At Blink Tower all members contribute towards creative inputs. Creativity is not limited to only [the] creative team, we are a small team, we don't have such teams, and we overlap duties.

**B) The reason why computer animation software, character design, cinematography and editing skills scored the second highest on the critical skills required for entry level animators.**

**B1) Findings**

The participants' views on this indicated that these are additional skills that support the main skill (telling story through performance). **INJHB 2** describes the main function of these skills as strengthening a story in animation and adding believability. However, **INJHB 3** and **INCPT 1** stress the point that computer animation software skills are a given for animators these days; without such skills they cannot animate. All the participants shared the view that the technical side of the animation industry is related to the use of computers in the form of modelling, rigging, rendering, lighting simulation, motion capture and camera tracking. **INJHB 3** again reminded us that all these skills can be given to separate individuals in a production. From a different angle, **INCPT 3** also made the point that the technical side of the animation industry is not only about the use of computers, but those aspects like the principles of animation and the framing of a shot can be seen as

technical as well. So knowing all such skills will allow an animator to produce an animated sequence from the character performance to the editing.

## **B2) Selected quotes**

### **INJHB 1:**

- Basically, obviously, the software – you need to know your software when you animate... Character design for animators is a nice thing to do... just like added aspects. Cinematography is quite good ... especially cinematography and editing because, basically, animation comes in film format. You need to know shot to shot...it really helps.

### **INJHB 2:**

- Because they assist in telling a story. Those are adding to the believability ...of the story. So, if the performance is not there, it is not going to carry the story and people will become disinterested
- I would say character rigging is definitely more technical because of the kind of maths and...lighting... although that's two sides of the coin because you have to be quite artistic and yet you have to be very technical and knowing the software and kind of fine tuning, and so lighting and rendering is like one thing ...it's very artistic, very technical. I would definitely say animation is the least technical because you're just basically moving around stuff... Animation is definitely a feeling and I would say more artistic.

### **INJHB 3**

- Well, I think...clearly computer animation has become a skill that nowadays you can't do without; you have to have skills in computer animation to be able to be a computer animator, so that is a given... Again, character design has to score high or has to be important because it's intrinsic to have to identify with that character, so having said that ...if you have a brilliant animator with poor character design

those two things can't live together... Cinematography works similarly: if I shoot my film or short film or commercial, cinematography is very, very important and editing again as well, but all those four things,[those] separate skills sets, they could go to separate people.

- That is a very good comment ... What tends to happen is that you kind of have animators, storytellers [who] have the technical teams that take care of rendering, but it comes down to the computer animation. Computer animation has driven that ...separation [of skills sets] because it takes a certain kind of person to do animation...but it takes another kind of person to take what he has done[and implement it...]
- Technical side could be more of the modelling, the rigging, the lighting and rendering –that would be the technical side.

#### **INJHB 4:**

- If you think about how you are going to sell animation to your client, you need to know those skills to tell the story, otherwise...no matter how good [an] animator you are, if you can't tell a story properly with camera moves then it's not going to work, it's never going to work for the client.
- Yes, in our facility we would look at what we need, you know what I mean, it's not always animators...it's separated, it's more technical,
- Technical for me is creating particles, simulation, motion capture, rendering, camera tracking – that's for me more of [the] technical side of the animation industry.

#### **INCPT 1:**

- I think being a generalist, personally; like I evolved from being just a generalist to an animator...I think as a generalist I learned from everybody and everything and that actually makes me a stronger candidate for animation director or animation lead or supervisor and [the]same goes for lighting artist, [the] same goes for an editor, 'cause these guys, if they understand animation, they understand

performance and timing, [and]then it helps the department as well and [helps them too, in] going forward, learning more and staying ahead...

- One thing obviously – software skills. Almost...well 90% of the time [in the]animated feature film industry, your software skills, the software that you're going to be working in is quite important. I mean ...Softimage, Maya, Studio max...

### **INCPT 3:**

- It is good for animators to have such skills, but performance – it is the key.
- The technical side of the industry can be in terms of the use of computers, etc.
- It also depends on what ...you mean by technical skills, the use of computers is one part, a technique can also be technical or even the principles of animation, framing a shot, etc.

### **C) The reason why the participants see creative skills as the more important in their selection process for junior computer animation positions**

#### **C1) Findings**

Two main points came out strongly from the participants' views with regard to this question: an eye for the visual, and creativity in the individual. **INJHB 1** indicated that the reason for the participants seeing the creative as more important is that in a visual industry; one needs to have an eye for anything visual. This means being able to tell whether an image is working or not. **INJHB 2** elaborated on how important it was for individuals to have creative skills because senior people would guide them through the process. **INJHB 3** believes that creativity is an inherent skill and people are born with it. There was also a critical view on the issue of whether it was possible to teach "creative technical skills or technical creative skills". Most of the participants felt that the person who commented on this issue during the questionnaire survey was playing with words to confuse them. However, all of the participants, including **INCPT 3**, who made the controversial statement

above, shared the same view that it is difficult to teach creative skills to a technical person, but you can teach a creative person technical skills. This can be seen in the comment by **INJHB 3** that in commercials, creative people can be taught technical skills to execute creative ideas, but in bigger companies, people in different positions are competent in different skills. **INJHB 4** and **INCPT 1** also concurred that it is easy to teach a creative person to use tools.

## **C2) Selected quotes**

### **INJHB 1:**

- Yes, it's because we are in a visual industry, so say this person is brilliant, you know, with technical skills ...[and] does not have [an] eye for any visual stuff, you always have a creative person sitting next to him telling him how to position stuff because if [he] can't see it, then it's kind of useless.
- I do think you can teach [technical skills]. Some people are more technical, technically minded than other people, but I do think you can learn to develop your eye, you can train yourself to see ...what is a good image, what is not. I think some people have it naturally...

### **INJHB 2:**

- [I] taught creativity at tertiary, so that kind of...inherent...characteristic of a person, if that show[s] high levels of creativity, you are on a winning wicket already...I would definitely say bring someone that is creative – they have got the skill sets already and then if there is [a need for] technical skills, senior people ... would be able to help them and guide them along.
- Playing around [with] words is not helping, is not making anything clear...you've always got to have both. You can't get into this industry, especially in South Africa. Obviously, here [in our company, there is] far more specialising. I would say you generally have to be Jack of all trades, but you can specialise in one area.



**INJHB 3:**

- We have exactly the same requirements here, basically because one does not exist without the other... We hire to complement skills, absolutely...It's very difficult to teach a technical person the creative skills because creativity is a kind of an inherent skill, something you are born with ...although technical skills are, technical thinkers are like that too.
- I think in the big studios, those two skills, they ...[belong to] different people, but in our kind of world, in these commercials[with] short turnaround times, those creative people can certainly be taught technical skills that they would need for them to get the bar.

**INJHB 4:**

- Yes...most creative people I have worked for, they've got a feeling for something, and they know that's the right way to do it. So they just need to learn technical skills to implement them, but [for] somebody who is very technical, it's very hard [for him] to extend the feeling from something or ... [show him] how to convey emotions in animation.
- It's easy to tell a creative guy...okay you put a bone from here and here, that's [going to] make this thing ... move – it's easy, but to teach somebody how this beautiful drawing shows emotions is very hard.

**INCPT 1:**

- For [a] creative will still learn to be technical; that's possible 'cause he comes from [a] creative background, so he puts all his experience of aestheticism [in]to that and he can still learn the nulls and ... all technical things.

**INCPT 2:**

- I think that what they are trying to say, [is that...] the guy who is really good with working the program and doing the rendering stuff, to make him somebody ....[who is] a creative person... is difficult, but if there is

a guy who is really creative, to teach him quickly how to use a program ... to execute the idea, that's easier,

**INCPT 3:**

- That means that you can't teach a technical person creative skills.

**D) The reason why the participants say that institutions teaching computer animation should focus more on creative skills.**

**D1) Findings**

Four out of seven participants agreed that institutions teaching computer animation should focus more on creative skills. Although they see creative skills as the main core, they believe that students need to have a certain level of technical skill. **INCPT 3**, **INCPT 1**, **INJHB 2** indicated that artistic skills should take preference to computer skills. Two participants believed that both skills are important and must be addressed equally. **INCPT 1** believes that both skills are important, because creativity makes one a stronger candidate for job opportunities. He went on to argue that most of the schools teach software, which produces generalists rather than animators. **INJHB 4** believes that both are important because institutions teach people how to make an object but not how to apply their skill in a real environment, and this does not serve them well. The reasoning behind this is that most people can be taught to make an object on a computer, but to put character into that environment is a challenge. This was also stressed by **INJHB 3** with the view that people getting into the industry from institutions in recent years do not have adequate creative or technical skills. In contrast, **INCPT 3** and **INJHB 2** held the view that three years of college or university studies was not enough; most of the good animators have been practising animation from childhood. It is a lifetime skill. In addition, **INCPT 2** disagreed with the view that institutions should focus on creative skills because he felt that people who study animation are naturally creative. It is clear that there are still different opinions on this issue, but there is consensus that creativity takes preference.

In an attempt to explore and understand why creativity should take preference, the participants agreed that technical skills are about solving problems. Most of the participants saw technical skills as solving computer software problems or challenges. For example, **INJHB 1**, **INJHB 3**, **INCPT 1** and **INCPT 2** refer to aspects like rigging a character, lighting and rendering as solving technical problems. They also indicated that in most cases this is performed by the technical personnel rather than an animator. From a different point of view, **INJHB 2** believes that technical skills are about knowing the procedures rather than solving problems. He strongly believes that one can only solve a technical problem creatively. This view brought us to a point raised by **INCPT 3** that the technical department does not solve creative challenges – rather, they develop software that creative people can use to produce creative works. In the view of **INCPT 3**, technical teams do not provide technical solutions for creative challenges. There are a number of variables that could explain this issue. One of the variables is reflected in the comment of **INJHB 4**. He/she explains that the South African animation industry does not have the capacity for technical teams to solve creative challenges. In South Africa, creative people use what the software provides; the tools come with the software and plug-ins are available.

## **D2) Selected quotes**

### **INJHB 1:**

- I totally agree with that, but I think both things are really important...I think they would have to focus on one thing, but they're both really important, because you need both, artistic people and...really technical people on teams; you can't do it without technical people.
- More technical people usually do the riggings which include the face, the muscles and then... if [the] animating ... [or] that shape does not work for you for some reason, they will solve that problem.

**INJHB 2:**

You do need to have [a] level of technical skills, as mentioned earlier, but creative skills are paramount. I would say that...I think kids need to be taught from entry level to high school, you need [to] kind of start teaching creativity even if is like a half hour subject per week. People need those skills and they are never taught them, but everyone just need [s] to think out of the box.

- I would not say technical skills are about knowing what to do, knowing the procedures. What are the specific details of what you need to achieve? But you need creativity to solve problems and thus not necessarily technical skill. When you have a problem, it's generally because something did not go right and X amount of time [spent on applying] technical skills will not let you sort out your problems... you need to apply your technical skills creatively.

**INJHB 3:**

- I mean, I would agree with that. I think that's right, I mean, we have seen lot of schools over the last couple of years producing people that are [not] very good at [either] creative or technical skills. They're kind of stuck in the middle ...[are] average in both departments, if I could put it that way.
- Technical skills are about solving problems. If I look at character rigging, for instance. Say a rigger ... has to rig, he has to put controls into a character model to enable it to move. There are certain things, for instance, like elbows [and] shoulders that are very complex mechanisms in the body and he might develop a solution to a problem for [the] shoulder region, for instance, so that when [the] animator moves that arm, there is this very smooth flow, it feels like a shoulder moving, it does not feel like a bit of tube stuck into the side of the box or something.

**INJHB 4:**

- I think both are equally important, technical and creative skills, I think both are equally...I think that is completely true because they teach

literacy in software but they don't teach how to use that in the real world environment, they don't solve problems with it, so they would know how to make the sphere but not how to make that sphere fit into the environment...they can make a sphere in software ... but now I want you to put that sphere into the shot environment...shot to the camera, that's more important than making the sphere, anyone can make the sphere...

- Our industry is not that big ...we use what the software's got because we don't have time to spend two years developing simulations for a commercial that we only have two weeks to finish, you know what I am saying? I mean it's always lovely to see what kind of stuff these guys do but in the real world environment you have to solve problems so quickly and on your feet. That's hard to explain, it ... need[s] experience.

#### **INCPT 1:**

- If you look at Open Window School of Design and Visual Communication, they don't only teach animation, they focus on design. They...focus on illustrations [and] all those aspects of film, photography and all those subjects help...other subjects, which creatively makes you a stronger candidate. So coming to a studio like Triggerfish, if you have good storytelling skills, if you have a good eye for detail, if you have a good sense of lighting, [and are good at]all those things in terms of colour, design, composition, cinematography, ...we look at...[him] and say yes, we can work with this person, he might need a bit of technical education but we will provide that.
- I think, since a lot of institutions teach software and the main focus is on the software getting out generalist instead of animators...it takes a very long time to get used to the software and actually know [it], 'cause it's divided in [to] so many little aspects. I mean you have your lighting, you have your animation part, you have your rigging, you have your texturing, and it consists of lot of different aspects, ...and

three years is...institutions usually teach software in three years but they don't specialise, so ...[from] a generalist's point of view it's good for an institution to teach the software, but then there is a massive gap between the creative and the technical , so you find a lot of institutions who just push out technical generalists but they have no idea what film is all about, they don't understand what storytelling is and so I think advice I can give to institutions is actually just [to] focus more on film and art.

- Like I said before, I mean in our industry there [are] quite a lot of technical problems; I mean you deal with rigging, you deal with rendering and lighting and all those things. Character...to make a character perform, rigging should be able to have the rig you need

#### **INCPT 2:**

- You can't really...I don't think you can teach people how to be creative; it's like, teaching Einstein to come up with an idea, you can't. It's something you want to do.
- Whether the creative guys got the idea or the director got the idea, if you call that creative, they know what they want. It's for technical guys to figure out how to do it.

#### **INCPT 3:**

- No one can become a good animator within three years of college studies; if you look at...most good animators you will realise that they have been practising animation from [an] early age.
- Schools should definitely teach artistic skills (animation) rather than computer skills.
- Analogy: astronauts – scientific technical people help them to develop machines that could get them to discover more planets, to explore the universe etc. In our context, technical guys develop software and hardware that creative people can use to generate or create artworks. ...In our context, technical teams do not really provide technical solutions for creative problems or ideas.

**E) The responses to the questionnaire survey charts, on whether the nature of the company or the size of the company could determine which skill is considered the more critical in the selection process for junior computer animation positions**

### **E1) Findings**

All seven participants, except one, confirmed the results of this question. **INCPT 3** expected a clear difference in the percentages between technical and creative skills in the animation studio. His reasoning was that creativity should be more valued because animation is about creativity. In confirming the results, **INJHB 1**, **INJHB 2**, **INJHB 3**, **INJHB 4** and **INCPT 2** indicated that small companies preferred to hire generalists whereas bigger companies would choose specialists.

### **E2) Selected quotes**

#### **INJHB 1:**

- I think if it's the company that...needs more technical people, then obviously [the] technical side will be more important, but...if you need both, it's always easier to teach someone technical skills than aptitude.
- Post-production...does lot of editing and effects....they need technical people, [they] need balance.
- The only thing that I can say is that...the small companies...[are] probably [more likely] to hire generalists, that have...both [kinds of] knowledge, and bigger companies would hire people with specific skills sets.

#### **INJHB 2:**

- Yes definitely, it's basically also going to work on [a] business to business function where ...we might have two great creative people and we just need a bunch of technical people most of the time.

- I mentioned earlier that in smaller companies you have a number of roles, your skills sets need to be little bit more varied, while in large companies you can specialise more.

**INJHB 3:**

- We have post-production facilities and so I would go with that. I would say that is correct: where there is the full-blown animation studio... there aren't many, but maybe like Triggerfish, which is doing film work in Cape Town, for instance, then that would be the first one that would make sense to me.
- Yes, I guess that would make sense; they won't hire a technical person but they will hire an animator... that would make sense because they would be looking ... for a person who specialises or animates.

**INJHB 4:**

- I was quite interested to see what your graphs are doing, to show that smaller companies have more equal technical and creative skills but those bigger companies – they're looking for more creative skills. That's very interesting because you can see why that is, because [a] small company does not have a specialisation, they don't have people specialising in one area – you know what I mean? They need someone that is a generalist, they need to rig, texture, everything; when you get to a bigger company you start working in a work flow. Basically you have people that do lighting, especially overseas. We don't do it a lot in South Africa but our bigger companies are starting to move that way, like Black Ginger in Cape Town, where they have guys specialising in certain areas...

**INCPT 1:**

- Yes, definitely, I think so. Like I said, if it is a fast turnaround, then you need creative thinkers, guys who can think outside the box very quickly; they can make [a] decision and apply it. In long productions,



there is still time for growth and development and that's why it is still feasible to get somebody that's not, maybe not as creative...but he can help out technically or slowly grow into his position.

**INCPT 2:**

- I would say it's quite true because a production house like us, we work, we get a script, a script is just a bare bone, an idea of what they want and a lot of ideas could get fleshed out, get figured out here, maybe get a script, which is only a written piece, from the script we do storyboard, we work out the whole sequence, as soon as it's boarded, we come up with the look and the feel, we come up with grade (colour grading), the whole treatment is done in a production house and then ...the animation, all the visual effects[and] all the post-production [is] also done by us...there is a lot of creative side, so creativity is very important in a production house also.
- It makes sense, maybe because the small companies have to do everything so I guess to execute an idea you need technical skills and creative skills, maybe that's why.
- Bigger companies are [implementing] crazy ideas which require lot of creative thinking to actually pull it off; they try new things ...that have never [been] done before, which demands not just the technical person [but also a person] that's really creative.

**INCPT 3:**

- In Figure 1, I would expect to get a huge difference of percentages on this one; at the moment it's at variance, so there is no clear cut. Creativity should be higher because animation is creativity.

**F) Responses to the view that students hoping to enter the South African animation industry should strive to become Jack of all trades first and specialise afterwards.**

**F1) Findings**

All the participants agreed with the statement that students hoping to enter the South African animation industry should strive to become jack of all trades first and specialise afterwards. The main reason for this is the fact that the South African animation industry is small, and the majority of the companies are small or medium-sized companies. Therefore it is safer to become a jack of all trades first and specialise later. According to **INJHB 2**, there are not many large companies and **INCPT 1** also mentioned two companies that are in long-form production (feature-length film production). People can specialise only in large companies because they have the capacity and strictly controlled roles. **INCPT 3** advises students to worship principles of animation and to freelance before they get to work in any company. That will help them develop quickly in the industry.

**F2) Selected quotes**

**INJHB 1:**

- I suppose it's always safe to be a generalist. At the same time you need interviews from employers looking at what you are interested in... you need to know everything in that pipeline ... probably a good idea to know...character design, and obviously animation, but then ...animation principles, not just to animate on the computer, but really understanding ...principles ...in animation and you [must] know them. I would probably add film and cinematography and stuff like that ... the rigging, modelling and I think lighting, [and] also technical.

**INJHB 2:**

- I totally agree, and it's because [of ] the [small]number of studios in South Africa and the size of the industry [that] you find that there are a lot of smaller companies, a lot of small companies, whereas [there

are] not so many large companies. In order to back up what I said earlier...you generally have both skills, ...if you get into a position like the company where there is a team and you are able to distinguish roles, that's when you specialise, and if you are getting into industry be aware that you might [in those] first three years of entering the industry, need to know a variety of things and going to specialise as an animator is not going to serve your career, It's why I would rather go as a generalist, then you can always specialise in what you like.

**INJHB 3:**

- Absolutely, because, especially in South Africa,[in] these kinds of studios, what happens is that [you want] to get a generalist, a guy who says 'I can do this and this', a little bit of everything [to] try to make a product look at least half decent or above [a] certain standard.

**INJHB 4:**

- I completely agree with question 2.5....even if you want to be a specialist later in your life,[or] move overseas and become a specialist, you will still have to start as a generalist because we don't have [a] market big enough [for everyone] to be a specialist at the beginning.

**INCPT 1:**

- Well, at the moment in South Africa I don't know how many long-form studios[there] are.[There] is only Trigger Fish, Jock of The Bushveld made a film recently and I don't know if they are still a long-form production, but at the moment the industry is still small and that requires you to be a generalist; a junior animator will still work on a lot of small productions [with] quick turnaround and that's going to require an understanding of taking a project from [the] start, from character design straight through [to] the final render, and to be able to do that you need to understand every little aspect of the production and that [gives] you [a] strong base...not only...in South Africa, but anywhere in the world.

**INCPT 2:**

- It is definitely like that because in America you get studios that are already big, so a hundred people working on...you tend to specialise just to do lighting or whatever. South African studios are smaller, so animators, instead of just having to do one specific thing[and] specialising you end up having to do everything; you do rigging, you do animation, you do the rendering, you do the compositing...because our industry is a bit smaller.

**INCPT 3:**

- Like I said in the questionnaire – anyone interested in animation must worship principles of animation.
- Most of our animators worked on a freelance basis before, and when they come to us they are already indicating [some] maturity in terms of creative technical skills.

**5.5 General summary of the findings according to the questionnaire results and objectives of the interview schedule**

During the questionnaire survey phase, the results showed that it was clear that telling a story through character performance was the main critical skill required for entry level animators. Other skills, including animation, computer software skills, character design, cinematography, and editing, were believed to be additional skills to complement the main skill. It was clear that companies considered creative skills more important for entry level animators; however, technical skills are important as well. One cannot exist without the other. Company size, the nature of the company and the type of production could also determine which skills, technical or creative, companies considered more important for entry level animators. All participants considered creative skills more important, based on these variables. It was also evident that teaching institutions should focus more on creative skills in order to serve the industry better. During the interview phase, all the respondents confirmed the questionnaire results. The reason given was that, because animation is creativity, telling a story through

character performance is the core animation skill and other skills support the computer animation production line. Creativity in telling a story through character performance can be seen in terms of unexpected or surprising actions and reactions of the animated character. An animator's main creative roles include generating ideas for unique or original character performances, and this is the main reason that companies, irrespective of company type, consider creative skills the more critical in their entry level selection processes. This also applies to the reason why schools should emphasise the teaching of creative skills rather than technical skills. The technical side of the animation industry is related to the use of computers in rigging, rendering, modelling, and lighting, among others. Students or people hoping to enter the animation industry are advised to become generalists first and become specialists later in their careers, because the industry is still developing.

## **5.6 Interpretation of the findings**

As was indicated in the previous chapter, the formulation of the questionnaire centred on the problematic issues encountered during the literature review provided in Chapters 2 and 3. The interview schedule was informed by the questionnaire survey results. Only main research questions were investigated in the second phase of the study. The interpretation of the findings is based on the main research questions investigated in phase one and two of the study.

During the questionnaire survey phase, it was clear that certain views on skills in computer animation have more weight than others. There was a clear majority view regarding the ability to tell a story through character performance as a critical skill for any animator. Secondly, there was a majority response that companies consider creative skills the more critical in their selection process for entry level animators. In the same context, it was evident that institutions teaching computer animation should focus more on creative skills. From the perspectives of both companies and institutions,

creativity is regarded as the more critical skill; however, both technical and creative skills are inextricably linked and equally important. A follow-up interview session was undertaken in order to gather more information based on the questionnaire results. The interview results confirmed the questionnaire survey results. The interpretation of the findings with regard to the questionnaire results and interviews is connected to specific problems with both opposing views: (a) technical and creative skills should contribute equally in the production process of a creative product (Conti, Coon and Amabile 1996:385; De la Harpe 2006:23). (b) In order for new animators to secure jobs in smaller computer animation companies, they must have a good balance of both technical and creative skills, while in bigger companies they can choose to specialise (Wells & Hardstaff 2008:19). In order to interpret the results based on the two opposing views, the same questionnaire and interview schedule structures were used.

Researchers investigated the relationship between technical and creative skills from different disciplines for different purposes i.e. Bilton (2007) in business, Wells & Hardstaff (2008) in animation, De la Harpe (2006) in graphic design, Chapman *et al.* (1997) in education, Conti *et al.* (1996) in psychology, among others. It became clear during the literature review that technical and creative skills serve each other equally in a production process, irrespective of discipline or field of study, type of production, company size, or nature of the company. Taking a closer look at three interacting components of Amabile's componential model of creativity in Conti *et al.* (1996:386), it was evident that domain-relevant skills and creativity-relevant skills play an equally important role when it comes to creativity. In a similar view during the questionnaire survey, one of the participants commented that "without each other, the production will not work. The artists need tools to make great art, and the technical team need artists to use their tools". Within the same context, other comments indicated that "all animators need good technical skills in order to understand the program they work in; however, it is essential to be creative. If you are creative and have a clear

concept of animation you are going to create, half of the work is already done". It was also stated by **INCPT 1** during interviews that both skills are important because creatively it makes one a stronger candidate when it comes to job opportunities. In this regard, the implications of giving attention only to either technical skills or creative skills were demonstrated in *Final Fantasy: The Spirits Within* (Tschang and Goldstein 2004:10). It is undoubtedly correct that both skills are inextricably linked in a production process in both individual and collaboration projects. The link can be seen in the animation production pipeline with regard to production stages, i.e. pre-production, production and post-production (Hayward (1971), *Antz* (1999), *Finding Nemo* (2003) Musburger and Kindem (2009) and Kerlow (2009)). According to Patmore (2003) and Kerlow (2009) an animation starts with the idea, which is developed from script to final animated sequences. Different people work in teams to complement technical and creative skills in order to achieve a quality creative product. In an individual project or in projects which require people to perform overlapping tasks, individuals have to know both skills in order to succeed. Therefore it is certain that one cannot do without the other in computer animation.

In this regard, there are different technical and creative skills sets required for departments or individual roles in animation production processes or pipelines. In certain instances, such as in small companies, individuals are expected to run a project from conceptualisation to completion (Bilton 2007:27). According to Wells (2002:3-4), an animator is a person with many skills, including, among others, illustration, fine art, screenwriting, music and camera work. It is clear from this view that new animators are faced with multiple challenges in animation production (Furniss 2007:176). The number of skills that an animator must acquire for an animator in this context can be seen in Kerlow's (2009) small production pipeline flow chart (see figure 3.8), in animation production cycles Patmore (2003:74-90), in commentary on the making of the movie *Antz* (1999), and in commentary on the making of the movie *Finding Nemo* (2003). Accordingly, the main animation domain-

relevant skills refer to 12 principles of animation developed by Disney studio in the 1930s and six new principles (Kerlow 2009:49-88, 295-317). All types of animation productions telling a story through character performance are the primary job of an animator (Wells (2002:7); Patmore (2003:10); Kerlow (2009:49); Pricken (2004:14)) and this can be achieved by the application of the principles of animation. It was evident that the participants shared the similar view that the main critical skills for an animator are telling a story through character performance, with 69% choosing level 5 as the level of preference and 19% level 4. Question (B) rated second highest, with 38% indicating level 5 as the level of preference while 31% chose level 4 and 25% level 3. According to **INJHB 4, INJHB 3, INJHB 2, INJHB 1, INCPT 3, INCPT 1 and INCPT 2**, the reason for these results is that animators communicate a particular message or tell a story through character performance. Other skills such as camera work, character design, scriptwriting, computer skills and visualisation/production design or production management were believed to be supporting elements in telling the story in animation. According to commentary on the making of the movie *Antz* (1999), and commentary the making of *Finding Nemo* (2003) it was clear that most of the creative inputs and development takes place during the pre-production and production phase. Animators usually execute ideas presented to them. It is in this context that **INJHB 1, INJHB 2, INCPT 1 and INCPT 3** held strong views on the fact that creativity is not only limited to certain departments or teams; animators as individual role players contribute enormously in animation creative processes. This view was echoed by Wells and Hardstaff (2008:148-149) who maintain that creativity in the animated form operates at any level. The participants believe that the role of the animator is to bring original and unique ideas for creative performance in animation. From a different perspective, **INCPT 1 INCPT 3 and INJHB 3** believed that it really depends on the size of the company; in small companies such divisions do not exist and individuals' duties overlap. This means that one can be involved in creative development, scriptwriting and animation.



If creativity is regarded as the more important skill, the question can be asked: what exactly is creativity in telling a story through character performance? According to Pricken (2004:15), practitioners (visual artists) cannot tell what creativity is but they can tell when they see it. All the participants shared the same view as Pricken (2004). In an attempt to understand this view, Hayes and Mellon (1990:1) suggested that any creative product should be original/novel, it should be valuable/interesting, and it should involve the mind of the creator. **INJHB 2** suggested that creativity in telling a story through character performance can be seen in terms of unexpected actions and reactions by the animated character or by surprise effects. In addition, the participants shared the view that creativity in telling a story through performance is about creating a unique and a surprising character performance. Therefore, it can be said that creativity in the role of an animator is to tell a story through character performance in an interesting, unique and original way. This proves the point that even if animation studios work in collaboration with advertising agencies in productions such as commercials (Kerlow 2009:70), and team members are given roles based on their strengths and job positions (Chapman *et al.* 1997:44) and Individuals work under strictly controlled positions and supervision (Bilton 2007:30) nevertheless, the animator plays an important creative role.

Since it is clear that both technical and creative skills are equally important in any creative production process and that the primary role of an animator in a production process is associated with creativity, why should people entering the animation industry be required to command high levels of technical skill in 3D computer animation? There are a number of variables that could determine this. Hume and Sizer-Coy (2009:20), for example, have indicated the gap and the need of such skills worldwide. Candy and Edmonds (1999:5) Robinson (2001:128-129) and Furniss (2007:176) demonstrated that the success of an individual in a creative process is determined by the ability to use the technology or tools. **INJHB 3** and **INCPT 1** also stressed the point that, these days, animators without computer animation software skills

cannot animate or function. The participants shared the view that computer animation software skills refer to such aspects as modelling, rigging, rendering, lighting simulation, motion capture, camera tracking, but **INCPT 3** indicated that technical skills are not limited to the application of the software; techniques or principles of animation are also technical. To understand the point made by **INCPT 3**, Bolter and Grusin's (1999:147) theory of remediation interrogated the issue of established media and new media. The theory argues that new media is a continuation of the old media. Although computer developments brought changes in animation techniques and principles, traditional cartoon animation developed by Walt Disney studios in the 1930s (Thomas & Johnston 1981; Kerlow 2009) still remain the point of reference. In this regard, Penny (1995:95) explains that artists or designers with higher levels of technical skill have a good chance of excelling in solving technical problems in producing creative products. The main challenge, according to Hume & Sizer-Coy (2009:20), is that new animators and established animators struggle to take advantage of new technology in creating new digital content.

Consequently, the participants considered creativity as the more important skill in the selection process for entry level animators. **INJHB 1** believes that is because we are in a visual industry. This view was also shared by John Lasseter (an animation director/executive producer at DreamWorks animation studios) when he said that story and character come first and computers are used as a tool (Pricken 2004:14). But according to Hayes and Mellon (1990), it often requires a long time for one to acquire knowledge in order to achieve creative productivity. This could mean that one needs to know and practise technical skills in order to reach the desired level of creative productivity. **INCPT 3** and **INJHB 2** also believe that most of the good animators have been practising animation from childhood. It is a lifetime skill. Therefore, in order for an animator to become creative, technical skills are also crucial (Weisberg 1999:227). Does this mean that technical skills drive creative skills or creative skills drive technical skills? This view calls

attention to the point made by INCPT 3, that technical people do not solve creative challenges; rather, they develop software that creative people can use to produce creative works. The reason for this can be seen in the comment by **INJHB 4**, that the small size of the South African animation industry means that it does not have the capacity for technical teams to solve creative challenges. Internationally, it is different; for example, at Pixar's production process technology model, Tschang and Goldstein (2004:10) demonstrate the importance of creative skills over technical skills. Therefore it is evident that it takes many years of practising technical skills for individuals to become creative in animation.

Flowing from the above, there are a number of variables that could determine whether companies should consider creative or technical skills or both skills crucial in their selection process for entry level animators. These variables include: the nature of the company, the size of the company, the type of production and the size of the industry. Six participants confirmed the results of the views on whether the nature of the company or the size of the company could determine which skill was considered the more critical in the selection process for junior computer animation positions. This view is based on the fact that small companies will prefer to hire jack of trades and bigger companies would go for people who specialise. According to **INJHB 4** "I was quite interested to see what your graphs are doing to show that smaller companies have more equal technical and creative skills but those bigger companies, they're looking for more creative skills". The reason for small companies opting for equal technical and creative skills is that the duties of animators usually overlap. **INCPT 2** believes that bigger companies try new things in order to set a particular trend.

Both animation and production studios indicated that creative skills are important in the selection process of entry level animators. However, **INCPT 3** expected a clearer difference in the percentage between technical and creative skills in the animation studio, because animation is creativity. It was

clear that post-production required people with both skills. **INJHB 1** remarked that post-production houses do a lot of editing and effects, so that they would require a well-balanced skills set.

In the South African context in the mid-1990s, most of the studios survived on commissions from commercials (Wright 2005:34-35). Recent years have seen a growth in film and collaborations in animation projects (2006:4,7). The Department of Trade and Industry report (2006:16) identified the lack of content development skills and technical skills in the film industry. Government agencies and industry associations joined forces in addressing this problem (2009:7). Why creativity is more important than the application of technical skills was clearly explained by Pricken (2004:14-18), Tschang and Goldstein (2004:10), Wells and Hardstaff (2008:18). In support of this view, **INJHB 2** said “Show high levels of creativity and you are on a winning wicket”. The participants **INCPT 3**, **INCPT 1** and **INJHB 2** felt that teaching institutions should focus more on creativity; however, there must be a certain level of technical skill. According to **INJHB 4**, the problem is that institutions teach people how use computers to make objects and not how to apply such skills in projects. In a similar vein, Chapman *et al.* (1997:40) showed that students can develop computer skills but find it hard to apply such skills in a creative product. In contrast, two participants, **INCPT 1** and **INJHB 4**, believe that both skills are important and they must be addressed equally. The reason given by **INCPT 1** was that having both skills makes one a stronger candidate when it comes to job opportunities. Wells & Hardstaff (2008:18) also emphasised the greater possibilities for students hoping to enter animation industry in becoming Jack of all trades. A good example can be seen with Youngwoong Jang, a winner of the Academy for Motion Picture and Arts Sciences Gold Medal for best student film. All the participants shared the view that students hoping to enter the South African animation industry should strive to become Jack of all trades first, and specialise afterwards. It is safer for a student to become a Jack of all trades first and specialise later because the South African animation industry is so small. But

according to **INJHB 3**, the industry is getting people from institutions that are not good at either creative or technical skills.

It can therefore be argued that:

In the view of animation directors, lead animators and animators, the ability to tell a story through character performance is considered the more critical skill for entry level animators in the computer animation industry. It was also made clear that creativity in storytelling through character performance can be seen in terms of interesting, unique and original character actions and reactions. However, technical skills, including computer skills, cinematography and editing, are also important. In determining whether technical or creative skills are considered the more critical in the selection process for entry level animators, a number of factors, including job position, company size and the nature of the company, should be taken into account. Therefore it can be said that:

- Animation studios and production houses consider creative skills more critical for entry level animators; whereas post-production houses consider both skills equally critical.
- Smaller companies consider both technical and creative skills equally important, while medium-sized and bigger companies consider creative skills more critical.
- Institutions teaching computer animation should focus on creative skills rather than technical skills.
- New animators or students should strive to become Jack of all trades first and specialise later in order to serve the industry well.

## CHAPTER 6

### CONCLUSION

#### 6.1 Summary of the preceding chapters

The aim of this study was to investigate practitioners' views and experiences of computer animation in relation to critical skills required for entry level animators. The study sought to answer the questions, "Are technical or creative skills considered more critical for entry level animators in their selection process?" and "Should institutions teaching computer animation focus on technical or creative skills?" The preceding chapters have provided definitions and discussions of the changes and opportunities presented by the incorporation of computers into animation production processes. Animation can be referred to as (a) the medium that has, as its goal, to tell a story or to communicate a message or to entertain through the character performance or visual effects, (b) the process of bringing life into characters or objects, achieved by different techniques such as computer graphics interface (Denslow 1997:1; Furniss 1998: 4-6; Sullivan *et al.* 2008:31; Wells 2002:3-4).

The use of computer technology in animation by practitioners has shaped the animation production processes in terms of new styles and new techniques. The new animation production processes have affected both new and established animators with regard to proficiencies in operations and applications of animation computer software. Through the process of technological shift, tensions between technical skills (in computer use) and creative skills have emerged in learning and production processes.

It is within this context that the critical skills required for entry level animators in computer-generated animation have been questioned. Researchers have reported that technical skills are given higher priority over creative skills in computer-generated animation. From another perspective, according to

Penny (1995:95), artists or designers with higher levels of technical skills have a good chance of producing creative products. In addition, it was suggested that people entering the animation industry should have a high level of technical skill in 3D computer animation (Hume & Sizer-Coy 2009:20). Pricken (2004:4) and Wells and Hardstaff (2008:20) have argued that, while both skills are important, creativity is more important. Weisberg (1999:227) and Tschang and Goldstein (2004:10) also asserted that creativity led technical skills. It was apparent in the literature review chapters that both sets of skills are important and interlinked within a specific domain field (Boden 1994; Candy & Edmonds 1999; Conti *et al.* 1996; De la Harpe 2006; Furniss 2007; Robinson 2001; Sternberg *et al.* 2004, Wells 2002).

Relevant research methods and procedures were followed (see chapter 4) in an attempt to determine practitioners' views at 13 South African companies. The study involved two phases, namely the application of a questionnaire survey, and semi-structured interviews. The participants' views were in favour of emphasis on creative skills and the ability to tell a story through performance in both company selection processes for junior positions and in schools teaching computer animation. Nevertheless, technical skills, including computer skills, cinematography and editing, were also considered important. These views, however, depended on a number of factors, i.e. the nature and size of the company were the main contributing factors. Animation studios and production houses considered creative skills more critical for the entry level animator; while post-production houses considered both skills equally critical. Smaller companies considered both technical and creative skills equally important, whereas medium-sized and bigger companies considered creative skills more critical. The participants also suggested that students hoping to enter the animation industry should strive to become Jacks of all trades first and specialise later in order to be on the safe side because the industry in this country is so small.

## **6.2 Contribution and recommendations of the study**

While conducting the research for this study, it became clear that the animation/production/post-production companies which participated acknowledged that telling a story through character performance is critical for the entry level animator and that they looked for creative skills rather than technical skills in aspiring animators. However, the results did not show a significant difference on either technical or creative skills in computer animation production. It was discussed in the study that there are several possible explanations for this view. There are considerable links between these two types of skills which makes it difficult to distinguish from each other. For example, creativity involves both the application of an imaginative process and the application of technique or technical choices (Wells & Hardstaff 2008:19). Clearly, technical and creative skills are interlinked in any creative process.

Another possible explanation for this is that, the animation production processes have changed because of technological developments. Animators are expected to acquire a multitude of skills i.e. computer software skills, character design, cinematography and editing. For this reason, it was evident that there are challenges for learners and animators in engaging with the application of technological tools creatively (Chapman, Fisher, Ashworth and Reavey 1997:40 and Wells and Hardstaff 2008:148-149). Apart from this, according to Hume and Sizer-Coy (2009:20) companies specialising in computer-generated animation struggle to find experts in three-dimensional computer animation worldwide. In South Africa, companies have raised concerns about the lack of technical and creative skills by the people entering the animation industry.

To conclude, while it is a given fact that technical and creative skills are both important in computer-generated animation, how to tell a story through character performance in a unique, original and interesting way is the key in any form of animation – “animation is about creativity”. The results of this



study add substantially to our understanding of the multitude of skills animators are expected to acquire and master. And the skills new animators or students need to acquire in order to secure a job as an animator.

The results of this study can serve as a base for future studies in educational programmes in animation (or visual arts and design) and skills development programmes in the animation industry. The results may further provide new animators or students who seek to enter the animation industry with information about which skills they need to acquire in order to secure a job as an animator.

The results can further be explored by institutions teaching animation and researchers in order to guide the development of the animation industry and new media and multimedia curricula.

### **6.3 Suggestions for further research**

The participants have advised students hoping to enter the animation industry to strive to become Jacks of all trades first and specialise later in order to be on the safe side because the industry is so small. In contrast, one of the participants indicated that in recent years, the industry has been getting people whose skills in both areas, technical and creative, are only average or inadequate. In addition, institutions are being criticised for not satisfactorily addressing lack of content development skills and technical skills in the South African creative industry (DTI 2005:16). Further research could focus on the cause of and the solutions to this problem in order to guide both institutions teaching computer animation and the South African animation industry in developing the field of animation.

Technological shifts in production, consumption and distribution also challenge educators and learners. In educational institutions, the use of computers can be seen both as a tool and a medium. In this regard, a tool (computer) is used for production, and at the same time it is used for

distribution, as a medium for learning and teaching. It takes a long time for students to become proficient in computer operations and to apply such skills successfully in their artworks (Chapman *et al.* 1997:41). Hume & Sizer-Coy (2009:19) assert that new animators find it hard to apply new technologies successfully in their productions. Another possible research avenue could focus on how both technical skills and creativity skills can successfully be taught in equal measure without compromising either in educational programmes in new media or multimedia.

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## **ANNEXURE A**

Questionnaire: Critical skills of entry level animators in the contemporary  
South African computer animation industry

## QUESTIONNAIRE: Critical skills of entry level animators in the contemporary South African computer animation industry

This anonymous, voluntary questionnaire aims to collate your views on critical skills required for entry level animators in the selected South African computer animation companies. All of the information supplied will be handled according to the code of research ethics of the Vaal University of Technology.

### Instructions:

The questionnaire is intended specifically for the animation directors lead animators and animators in the field of computer animation. Please mark the block applicable to you or your company with an X and comment where applicable.

## BACKGROUND

### 1. Brief information about yourself

Position	
Name of your Company (refers to the animation company you are working for)	

### 2. What is the nature of your company? (check **only one**):

- (a) Animation studio..... 

...
.
- (b) Post production house (*with an animation department*)..... 

...
.
- (c) Production house (*with an animation department*)..... 

...
.

### 3. What type of production does your company mainly focus on? (check **only one**):

- (a) Animated TV commercials..... 

...
.
- (b) Animated Music Videos..... 

...
.
- (c) Animated TV series..... 

...
.
- (d) Animated Internet series..... 

...
.
- (e) Character animation for game development..... 

...
.
- (f) Animated feature length film/Short animated film..... 

...
.
- Other specify..... 

...
.

### 4. What is the size of your company?(check **only one**):

- (a) Small company (less than 5 employees)..... 

...
.
- (b) Medium-sized company (6-20 employees)..... 

...
.
- (c) Large company (+-100 employees)..... 

...
.

## QUESTIONS

5. What critical skills does your company look for in new animators? (Please indicate your score, 1 is the lowest score and 5 is the highest score for each option).

	Skills	1	2	3	4	5
A	Good storytelling skills ( <i>story development, scriptwriting, storytelling techniques</i> ).					
B	Good character design skills ( <i>cartoon characters, stylised characters, realistic character, personality of a character, appeal, drawing, anatomy</i> ).					
C	Good visual and look development skills ( <i>storyboarding, overall styling and the visual atmosphere; i.e. colour keys, environment designs and props</i> ).					
D	Good at production strategies ( <i>planning the production flow, defining creative goal, budget and scheduling</i> ).					
E	The historical development of the technical animation production processes.					
F	The historical development of computer animation techniques and styles.					
G	Advanced skills in computer modelling techniques ( <i>curved lines, geometric primitives, sweeping, free-form objects, free-form curved surfaces, subdivision surfaces, logical operators and trimmed surfaces, photogrammetry and image-based modelling</i> ).					
H	Advanced skills in computer rendering techniques ( <i>Hardware Rendering, non-photorealistic rendering, image-based lighting, global illumination and Radiosity, Ray Tracing, Z-Buffer, Lights, Camera and Materials</i> ).					
I	Advanced skills in telling a story through performance ( <i>acting techniques for bringing an animated character to life, principles of animation</i> ).					
J	Good editing skills ( <i>sequencing and compositing</i> ).					
K	Good cinematic techniques ( <i>camera techniques, camera shots, camera lenses</i> ).					
L	Advanced skills in animation computer software ( <i>such as Maya/Studio Max/Light wave/After Effects/CAD/Final Cu/Avid/Premier</i> ).					
Please comment on your lowest and highest critical skills scores:						

6. Does your company encourage specialisation from its employees into either?

Technical skills or	
Creative skills	

7. How do technical skills and creative skills relate to each other in computer animation productions?

**8. Please indicate your level of agreement with the following statement: Usually, junior computer animators' working context requires executing creative ideas developed by others.**

Strongly agree		Agree		Disagree		Strongly disagree		Undecided	
----------------	--	-------	--	----------	--	-------------------	--	-----------	--

Please comment on why you agree/disagree/ are undecided?

**9. Are technical skills (computer use) or creative skills (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company? (Please indicate your score, 1 is the lowest score and 5 is the highest score for each option).**

	1	2	3	4	5
Technical skills					
Creative skills					

Please comment, why either technical skills (computer use) or creative (conceptual) skills are considered more critical in your company at this job level.

**10. In your opinion and from your experience, should institutions teaching computer animation focus more on technical or creative skills? (Please indicate your score, 1 is the lowest score and 5 is the highest score for each option).**

	1	2	3	4	5
Technical skills					
Creative skills					

Please comment on the reasons for the above scores.

**11. What advice would you give to students hoping to enter the South African animation industry regarding their choice of skills acquisition?**

**12. Do you have any general comment with regard to the critical skills required in computer-generated animation?**

## **ANNEXURE B**

Letter informing the identified companies about the intentions of the study  
and the request for permission to distribute the questionnaires

**To Whom It May Concern:**

Date: 06 December 2012

SUBJECT: Request for permission to distribute questionnaires

I am Mashaole Makwela, a Multimedia lecturer and a student at the Vaal University of Technology, Vanderbijlpark campus. I am presently conducting a research project for my Master's Degree on "A discussion of the critical skills required for entry level animators in the contemporary South African computer animation industry: A focus on the technical and creative skills". The research method is based on a questionnaire survey and this anonymous, voluntary questionnaire aims to collate the animation directors and lead animators' views on whether technical skills or creative skills are more critical for entry level animators in computer animation productions. All the information supplied will be handled according to the code of research ethics of the Vaal University of Technology.

In this context, I would like to request for your permission to distribute the questionnaires to the animation directors and lead animators (or head animators) in your company. The hard copy of questionnaires will be distributed on site or send through e-mail for completion and the time required to complete the questionnaire is 10-15 minutes. Please attached see the questionnaire sample.

I would greatly appreciate your consent to my request. If you require any additional information, please do not hesitate to contact me at:

Mashaole Makwela

Tel: 016 950 9107

Cell: 072 151 0333

[Mashaole@vut.ac.za](mailto:Mashaole@vut.ac.za) (or [mashao1@hotmail.com](mailto:mashao1@hotmail.com))

**Supervisor/study leader, contact details:**

Rolf J. Gaede (DTech, DPhil)

Associate Professor, Faculty of Human Sciences

Vaal University of Technology

Private Bag X021 Vanderbijlpark 1900 South Africa

Tel: 016-950-9973/9465; Fax 016-950-9789

[rgaede@telkomsa.net](mailto:rgaede@telkomsa.net) (or [rolf@vut.ac.za](mailto:rolf@vut.ac.za))

Yours sincerely

Mashaole Makwela



## **ANNEXURE C**

Vaal University of Technology research policy

# ***RESEARCH POLICY***



## ***VAAL UNIVERSITY OF TECHNOLOGY***

Owner: Dean: Research

1. Policy approved in 2006
2. Revised policy approved by Senate, 3 March 2006
3. Appendix C approved by Senate, 17 November 2006

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## Description

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## VAAL UNIVERSITY OF TECHNOLOGY RESEARCH POLICY

### 1. GENERAL RESEARCH OVERVIEW

#### 1.1. Introduction

Research and its supporting activities form important and integral facets of tertiary education. The Vaal University of Technology accepts its premise, and research together with education and community service, is seen as being one of the University's primary functions.

Although research in itself is important, the aforementioned three functions are as such interdependent and complementary to one another so that one has to continually realise the relative importance of each.

#### 1.2. Definition

Research in this context includes those activities intended to produce one or more research outcomes, including the creation of knowledge, reorganisation, and application of knowledge.

The preparation and publication of research findings and the reading of research papers at specialist conferences and seminars are included, depending on the primary purpose for which the research is undertaken; the following cases may be distinguished:

- Research which is undertaken primarily as an academic/instructional activity where a staff member could act as promoter/co-promoter/supervisor of, for example, MTech and DTech Degree students.
- Research which is undertaken by staff members primarily in order to obtain further academic qualifications.
- Research and development which is undertaken on a consultation or contractual basis.
- Research and development conducted for the express purpose of producing research outcomes (and not primarily for one of the above reasons). Activities carried out with University funds or in terms of agreements with external agencies, such as the National Research Foundation (NRF), are included.

#### 1.3. Categories of Research

Depending on the objectives of the research, the following distinctions can be made:

**Basic Research** is a creative and systematic investigation conducted primarily with the aim of increasing knowledge. Basic research thus aims at the solution or explanation of problems integral to the fields of knowledge, the exposure of new fields of research or the expansion of knowledge.

**Applied Research** is a creative and systematic investigation performed to increase knowledge, but the primary aim of devising specific practical applications. The practical aim of applied research may be to:

- determine possible uses of basic research, or
- determine new methods of achieving specific and predetermined aims.

**Developmental Research** is the systematic activity involved in the utilisation of existing knowledge gained from research and/or practical experience, in order to design, evaluate, and adapt services, processes, systems, materials, products or devices, with a view to the implementation and/or manufacture; or to substantially improve existing ones. Development is directed towards bringing about new applications of knowledge and adapting and improving existing human and natural science technology, whether of a local or foreign origin.

#### **1.4. Research at the Vaal University of Technology**

Although basic, applied (problem-solving) and developmental research are not always seen in isolation, the Vaal University of Technology wishes to actively promote **Applied** and **Developmental Research** by:

- creating a relevant research culture,
- promoting research outputs,
- increasing funds available for research,
- continually reviewing its research policy,
- recognising research performance, and
- efficiently managing research.

#### **1.5. Management of Research**

The active management of research at the Vaal University of Technology occurs at **Faculty level** where the expertise in specific fields/areas lies.

The role of the University Management is that of encouraging and supporting research by:

- Creating an environment that contributes towards effective research aimed at developing research skills and competence amongst students and staff: these important aspects of personal development should also have a positive effect on the quality of education,
- Providing grants and incentives to help finance research costs of deserving research projects through the **University's Central Research Committee**, and
- Allocating research funds to individual researchers/faculties/departments
- Motivating involvement and participation of faculties, departments and staff in activities and programmes of the NRF or any other external organisation.

## **1.6. Research Output**

Research output could be in the form of:

- original research articles and review articles which appear in an approved journal for the subject specialist, as specified by the Department of Education for subsidy purposes,
- books and chapters in books for the subject specialist (including conference proceeding, dissertations, theses and reports on contract research conforming to the definition of research above),
- patents,
- artefacts, this also includes processes and engineering models/prototypes,
- unique and new products e.g. for food industry or software or visual arts and design,
- outputs not recognised as accredited by Department of Education to be evaluated in terms of peer evaluation informed by Research Policy and other documents adopted by Vaal University of Technology.

## **2. RESEARCH OBJECTIVES**

The following research objectives have been defined:

- 2.1 To promote all facets of research that benefit teaching and learning, the community and both the private and public sectors of the country.
- 2.2. The intellectual development of students/researchers, for them to be able to synthesise i.e. act in a seriously thoughtful substantiated/responsible, creative and problem-solving way.
- 2.3. To promote the development of a research culture: supporting staff and students in stimulating research and in so doing, effect a scientifically distinguished research environment.
- 2.4. To create an enabling environment to promote research this includes establishing infrastructure.
- 2.5. To obtain financial support from institutions such as the NRF, DTI and other sources, including the private and public sectors.
- 2.6. To promote co-operation with trade and industry with regard to research and co-operative projects as well as to engage in contract research.
- 2.7. To provide required research related services and liaison at a local, national and international level.
- 2.8. To meet the University's social obligation through:
  - development of advanced skills and knowledge of human capital,
  - research that contributes to general economic development,
  - the development of technology that benefits the community,

- the improvement of the environment, e.g. research related to pollution, and
- projects aimed at uplifting milieu-deprived communities.

## **VAAI UNIVERSITY OF TECHNOLOGY RESEARCH CODE OF ETHICS**

### **1. Preamble**

The research code of the Vaal University of Technology gives expression to the standards and values that apply in the Vaal University of Technology and to which all Vaal University of Technology researchers commit themselves in their research.

The Vaal University of Technology undertakes and promotes research in order to find workable solutions to problems and thus to help establish a just and healthy working society. In the execution of this task the Vaal University of Technology strives for the fair distribution and responsible utilisation of the resources and benefits of its research and its other research-based services in the interests of South African society as a whole. The Vaal University of Technology thus endeavours to conduct research

- with scientific integrity and excellence, but also
- with a sense of social sensitivity and responsibility, and at all times
- with due regard for the dignity and individual basic human rights.

In the pursuit of this ideal the Vaal University of Technology subscribes to the principles of scientific responsibility and critical involvement, integrity and honesty, of human dignity and of academic freedom. These principles should always be understood in terms of their interrelationship and mutual coherence. In the research context these principles find expression in the relationship between the researcher and

- the research community,
- society,
- the participants in the research, and
- the sponsors/clients in research.

### **2. The researcher and the research community**

The Vaal University of Technology requires all researchers to maintain the highest ethical and safety standards particularly when human and animal subjects are involved.

- 2.1. Research is carried out in a scientifically responsible manner at all times. The researcher (research team) accepts responsibility for the design, methodology and execution of the research; plans the study in such a way as to optimal the validity of the findings; reports the limitations of the findings and indicates where applicable, possible alternative interpretations.
- 2.2. The right of fellow researchers to select from a variety of paradigms, methods and techniques is acknowledged.

- 2.3. In the communication of their findings, researchers subscribe to the principles of honesty, comprehensiveness and exposure to public scrutiny.
- 2.4. The authority of the professional codes of specific disciplines is recognised and honoured.
- 2.5. Researchers may not misuse their positions as researchers for personal gain e.g. use student ideas and patent as your own idea.
- 2.6. That the researcher/research team gives due acknowledgement (financial or resource support) to the Vaal University of Technology in any of its reports, publications or visual presentations.

### **3. The Vaal University of Technology and society**

- 3.1. The Vaal University of Technology through its researchers is committed to conduct research that will contribute to the welfare and quality of life of all South Africans.
- 3.2. The Vaal University of Technology through its researchers is sensitive to all forms of inequality and injustice in society and, through its research and other forms of service; attempts to contribute to the improvement of the less advantaged and deprived South Africans.
- 3.3. The Vaal University of Technology recognises the rights and freedom to have access to research findings and information and always acknowledge the individual; however the individual and other institution's rights will be protected according to the South African Constitution.

### **4. The researcher and participants in the research process**

- 4.1. In the planning and execution of a study, the researcher always takes into consideration the ethical acceptability and the foreseeable consequences of the research.
- 4.2. Should conflict arise between the interests of the researcher and the interests of individual participants, the principle holds that the interests of the latter take precedence. The researcher should be constantly aware that the research may prejudice the situation and position of the research participant. Research and the pursuit of knowledge should never be regarded as the supreme goal at the expense of other personal, social and cultural values.
- 4.2. Before participation in research is requested, a clear and fair agreement is reached with the participants. Where appropriate, the researcher informs participants about all aspects of the research – including its aims and implications – which might reasonably be expected to influence their willingness to participate. The researcher takes care at all times to obtain the informed consent of the participants.



- 4.4. The researcher respects the right of individuals to refuse to participate in research, and to withdraw their participation at any stage.
- 4.5. The researcher protects participants against foreseeable physical, psychological or social harm or suffering that might be experienced in the course of, or as a result of the research. The researcher is particularly concerned about the rights or interests of more vulnerable participants, such as children and the aged. When there is a risk of harm the participants or their guardians are duly informed beforehand. When research has unforeseen and undesirable consequences, the researcher is responsible for identifying, and where possible, for undoing these consequences.
- 4.6. Information obtained in the course of research that may reveal the identity of a participant is treated as confidential unless the participant agrees to its release.

#### **ANNEXURE D**

The process assessment plan: Critical skills of entry level animators in the contemporary South African computer animation industry

	CITY	COMPANY NAMES	CONTACT PERSON	E-MAIL	Rc	Rm	Rmphone (16 January 2012)	Unable to	Received reminder
1.	CA	Lung	Claudio Pavan	<claudio@lung.co.za>	x	-	-	-	-
2.	CA	Wickedpixels	Craig	info@wickedpixels.com		xx	On Tuesday the 24 JAN		
3.	CA	Trigger Fish	Jako Tromp, quentin vogel	<Jako.Tromp@triggerfish.co.za><quentin.vogel@triggerfish.co.za>	xx	-	-	-	-
4.	CA	Black ginger		'info@blackginger.tv'	-	xx	I was told that they will come back to me and they have lot e-mails to go through.		
5.	CA	Clockwork zoo		'Liezal.vermeulen@octagon.com'/ Info@clockworkzoo.com	-	x	The company was closed 2011, Condor Cape Town bought the company. Presently the company is on liquidation process. They could not help me.	-	-
6.	CA	Blinktower	Adrian Burger 021 447 3362, Cape Town	<a href="http://www.blinktower.com">www.blinktower.com</a> <a href="mailto:adrian@blinktower.com">adrian@blinktower.com</a>	x		Phoned 26/01/2012		
7.	CA	Strika		'oliver@strika.com'/ /Bruce@strika.com	x	x	They will come back to me/ received		
8.	CA	Tincup		'matt@tincup.tv'	-	-	-	Because He is just only him who makes up tincup.	-
9.	CA	Sunrise		'phil@sunrise.co.za'; 'Nicola@sunrise.co.za'	-	x	Nicola is in overseas; Phil will come back to me if he got time.		
10.	CA	Rooftop		'mickie@rooftop.co.za'	-	xx	Richard is the relevant person to assist me on this issue. E-mail was sent to Richard		
11.	CA	Juju		'hello@juju.co.za'	-	xx	The company is in the process of closing down		
12.	CA	Disko		'info@disko.co.za'	-	x	Phone is ringing without any respond		
13.	CA	Condor cape		'info@condorcape.com'	-	x	Could not assist me because the company is on a liquidation process		

14.	CA	Character matters		'Chris@charactermatters.com'	-	xx x	Phone not ringing, after a while it gives the disconnected sound.		
15.	CA	10kilo		'yolanda@10kilo.co.za'	-	x	Phone is ringing without any respond		
16.		Bugbox	Margo freeman	<margo@bugbox.co.za>	xx				
17.		Red pepper	Rhea Derham	<rhead@redpepper.co.za>	x				
18.		Solid Black	Hans Sedgwick	<hans@solidblack.co.za>	x				
19.		jock-animation		'info@jock-animation.com'	-	x	Phone is ringing without any respond,		
20.		fireflyanimation		'jamjar@fireflyanimation.com'; 'ant@fireflyanimation.com'	-	xx	Office line not accessible and the cell phone is off		
21.		digivention		'info@digivention.co.za'	-	x	Cell number not functional.	-	-
22.		basefx		'jay@basefx.co.za'	-	x	Phone is off	-	-
23.		animate		info@animate.com	-	x	They cannot assist me because they are busy	-	-
24.		mindseyecreative		'jenna@mindseyecreative.co.za'	x	x	They will come back to me		
25.	JHB	Moi		'rory@moi.co.za'	x	x	-	-	-
26.	JHB	urbanbrew		eddyh@urbanbrew.co.za	-	x	They are extremely busy, they could not complete the questionnaire	-	-
27.	JHB	Master and savant	MathepeloMofokeng	<mat@mastersandsavant.com>	xx	-	-	-	-
28.	JHB	Sphere animation	Lorraine Padayachee	<lorraine@sphere-animation.com>	-	-	-	they are extremely busy, they could not assist me, even in January 2012 (e-mail dated: 09/12/2011)	-
29.	JHB	Refinery/monster studios	Jean du Plessis	<a href="mailto:infor@refinery.co.za">infor@refinery.co.za</a> , <a href="mailto:Jean@refinery.co.za">Jean@refinery.co.za</a>	x	x			
30.	JHB	Paper cut studio		mcurado@papercutstudio.co.za,	-	x	Phone is ringing without any respond	-	-

## **ANNEXURE E**

Interview schedule: Critical skills of entry level animators in the contemporary  
South African computer animation industry

**INTERVIEW SCHEDULE: Critical skills of entry level animators in the contemporary South African computer animation industry**

**1. Schedule**

<b>JOHANNESBURG: Interviews</b>	<b>CAPE TOWN: Interviews</b>
<b>Date: 24 February 2012 [Face to face]</b>	<b>Date: 14 March 2012 [Face to face]</b>
<p><b><u>Interviewee 1</u></b>  Name of the company: <b>Ministry of illusion</b>  Name of the interviewee: <b>Rory Mark</b>  Venue: <b>Ministry of illusion cafeteria</b>  Time: <b>09:30 [25 minutes]</b></p> <p><b><u>Interviewee 2</u></b>  Name of the company: <b>Solid black</b>  Name of the interviewee: <b>Hans Sedgwick</b>  Venue: <b>Solid black studio</b>  Time: <b>10:30 [25 minutes]</b></p> <p><b><u>Interviewee 3</u></b>  Name of the company: <b>Bug box</b>  Name of the interviewee: <b>Heidi Stohr</b>  Venue: <b>Bug box studio</b>  Time: <b>13:00 [25 minutes]</b></p>	<p><b><u>Interviewee 1</u></b>  Name of the company: <b>Blink Tower</b>  Name of the interviewee: <b>Adrian Burger</b>  Venue: <b>Blink Tower office</b>  Time: <b>12:30 [30 minutes]</b></p> <p><b><u>Interviewee 2</u></b>  Name of the company: <b>Wicked pixels</b>  Name of the interviewee: <b>Gavin Coetzee</b>  Venue: <b>Wicked Pixels Editing suite</b>  Time: <b>13:20 [30 minutes]</b></p> <p><b><u>Interviewee 3</u></b>  Name of the company: <b>Trigger Fish</b>  Name of the interviewee: <b>Quentin Vogel</b>  Venue: <b>Trigger Fish board room</b>  Time: <b>15:00 [32 minutes]</b></p>
<b>Date: 28 February 2012 [Telephone]</b>	
<p><b><u>Interviewee 4</u></b>  Name of the company: <b>The Refinery</b>  Name of the interviewee: <b>Jean du Plessis</b>  Time: <b>18:00 [25 minutes]</b></p>	

**2. List of questions**

**2.1 The questionnaire results have indicated that advanced skills in telling a story through performance rated the highest as the main critical skills required for entry level animators in animation studio, production house and post production with animation department (see table 1: page 7). How can this be explained?**

- *What could have been the reason why animation studio, production house and post production regarded telling a story through performance as more critical?*
- *Usually animation production pipeline is divided into three departments or teams, namely creative team, production team and production management, would I be*

*correct to say that the main creative activities take place in the creative department and the production team execute ideas presented to them?*

- *What is creativity in telling a story through performance anyway?*
- *Can you give any specific example of a scene in a film or commercial to substantiate your answer?*

**2.1.1 The questionnaire results also indicated that animation computer software, character design, cinematography and editing skills scored the second highest on the score level 5. How can this be explained?**

- What is your response to the following comment from the questionnaire?  
*"The highest skills I have indicated are important, but that all depends on the area in animation the applicant is applying for, if they want to be character animators, then acting and storytelling skills are important, if they are more interested in the technical side of the animation industry, then modelling, and rendering skills are important. However, it is good to have an overall knowledge of all these things."*

*Probe question: In your view what is technical side of the animation industry?*

**2.2 Table 2 (see page 7) respondents to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company? -indicated that participants' views are leaning towards creative skills as being more important. In your opinion how can this be explained?**

- What is your response to the following comments from the questionnaire?
  - *"Depends on the position you are applying for. We need both to fulfil the clients needs".*
  - *"Technical skills can always be caught up/taught, real creative skill not. The truth is any studio is a combination of people anyway. We hire to complement skills".*
  - *"As mentioned previously Creative takes higher preference, always. You can teach creative technical skills, but it is very difficult to teach technical creative skills".*

**2.3 Table 3 (see page 7) respondents to the question: In your opinion and from your experience, should teaching institutions of computer animation focus more on technical or creative skills-indicated that 56% of the highest level of preference (5) thought that institutions teaching computer animation should focus more on creative skills, whereas 31% thought that the focus should be more on technical skills. Any comment on these results?**

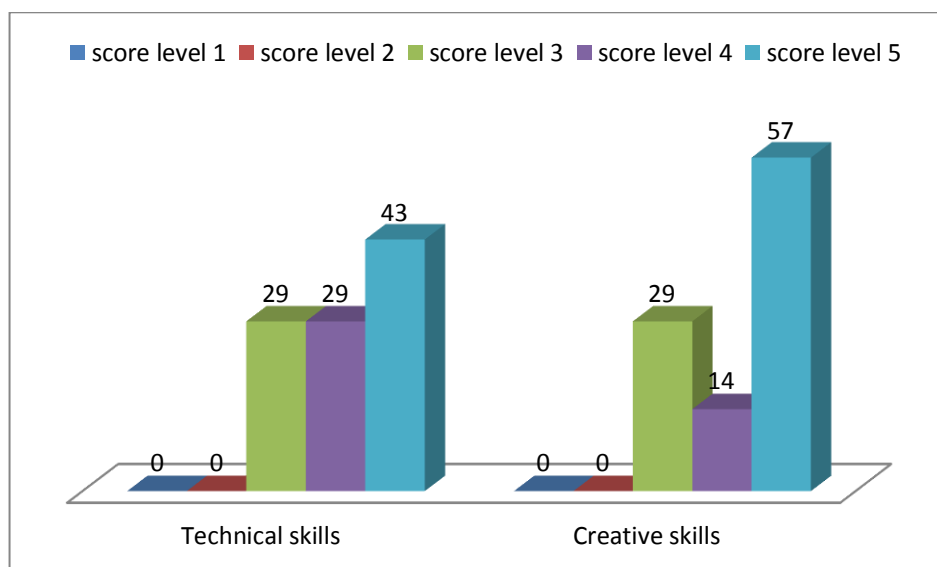
- What is your response to the following comment from the questionnaire?

*In my opinion, the biggest problem is that the schools are too focussed on software literacy, and don't focus on either of these things. Artistic skills are about learning principles, technical skills are about solving problems. Both of these need to be urgently addressed.*

Probe question: *technical skills are about solving problems, what does this mean, can you give an example?*

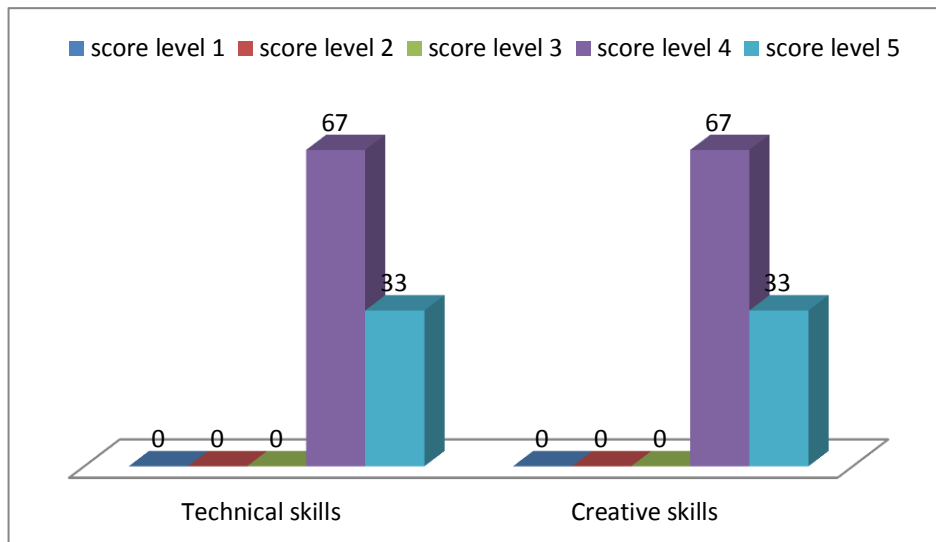
## 2.4 What is your response to the following summary of the results of the questionnaire survey?

**2.4.1 Question: Do you think that the nature of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

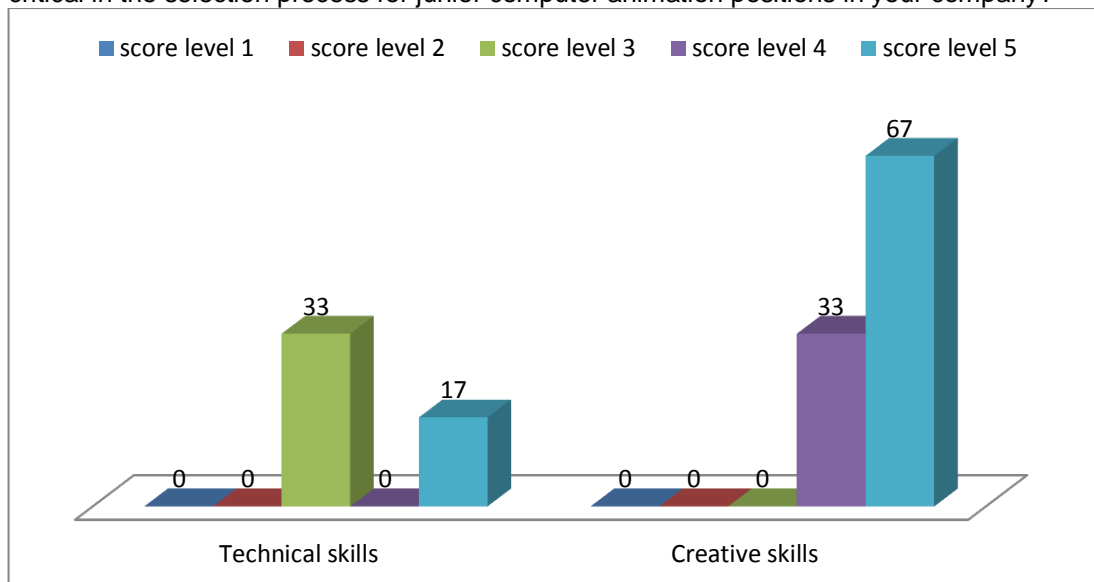


**Figure 1:** Responses of the animation studios to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



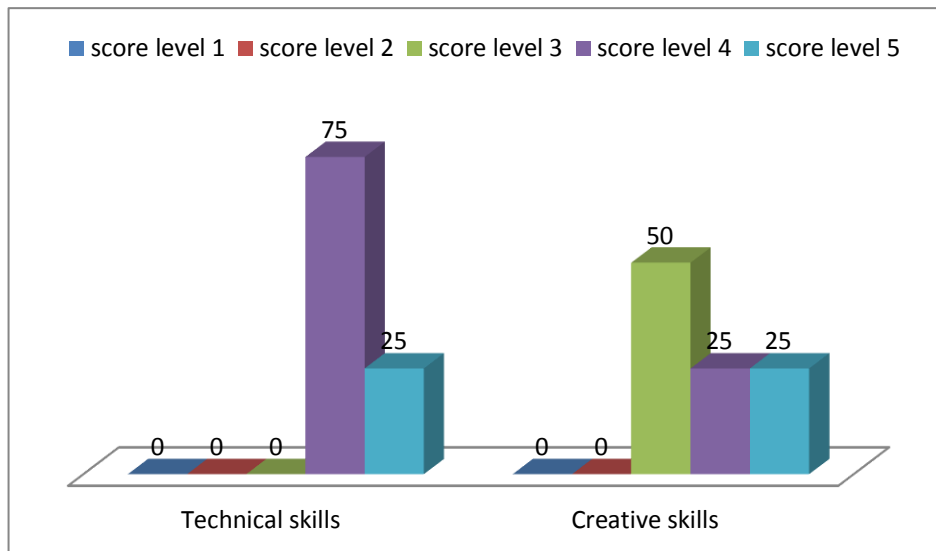


**Figure 2:** Responses of the post-production houses (with animation department) to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?

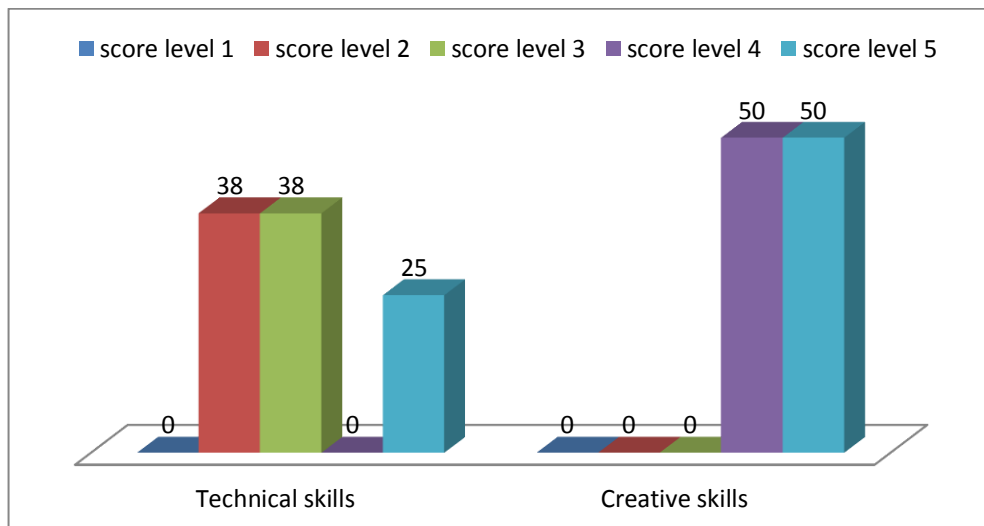


**Figure 3:** Responses of the production houses (with animation department) to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?

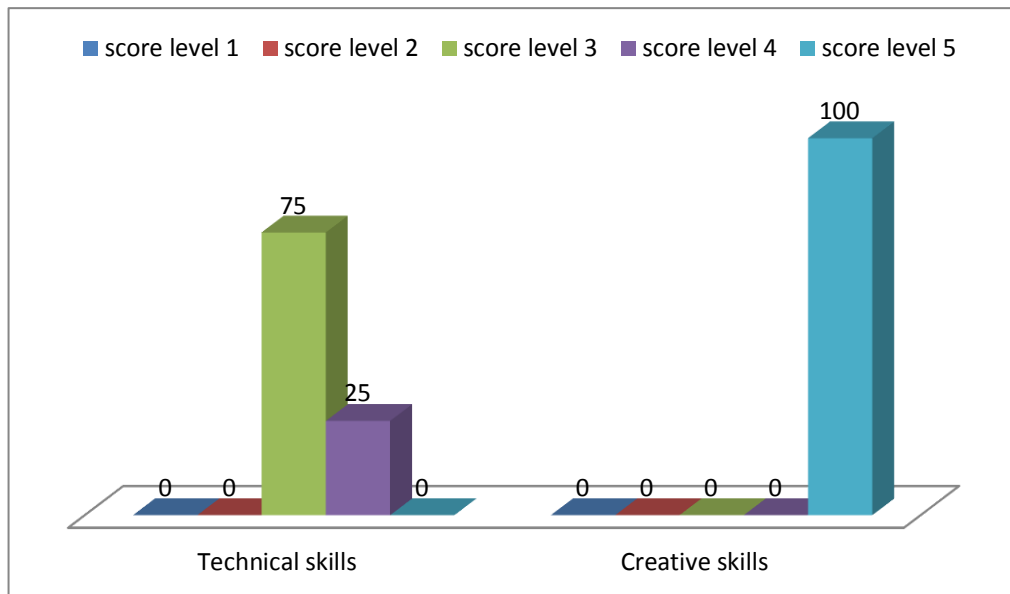
**2.4.2 Question: Do you think that the size of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**



**Figure 4:** Responses by the size of the company (small companies) to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



**Figure 5:** Responses by the size of the company (medium-sized companies) to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?



**Figure 6:** Responses by the size of the company (large companies) to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in the selection process for junior computer animation positions in your company?

**2.5 What is your response to the view that students hoping to enter the South African animation industry should strive to become Jack of all trades first and specialise afterwards.**

- *"In South Africa we don't have many studios where animators can become specialists. Usually a generalist is required".*
- *Do you agree with this view?*
- *Is there any specific reason why you agree/disagree with this view?*

**Table 1:** Advanced skills in telling a story through performance.

<b>Question 1:</b> Advanced skills in telling a story through performance ( <i>acting techniques for bringing an animated character to life, principles of animation</i> ).		
Score	n	%
1	1	6
2	0	0
3	1	6
4	3	19
5	11	69
<b>Total</b>	<b>16</b>	<b>100</b>

**Table 2 Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company?**

<b>Question:</b> Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company? (Please indicate your score. 1 is the lowest score and 5 is the highest score for each option.)					
Technical skills			Creative skills		
Score	n	%	Score	n	%
1	0	0	1	0	0
2	3	19	2	0	0
3	6	38	3	2	13
4	4	25	4	5	31
5	3	19	5	9	56
<b>Total</b>	<b>16</b>	<b>100</b>	<b>Total</b>	<b>16</b>	<b>100</b>

**Table 3.**Should institutions teaching computer animation focus more on technical or creative skills?

<b>Question:</b> In your opinion and from your experience, should institutions teaching computer animation focus more on technical or creative skills? (Please indicate your score. 1 is the lowest score and 5 is the highest score for each option.)					
Technical skills			Creative skills		
Score	n	%	Score	n	%
1	0	0	1	0	0
2	1	6	2	0	0
3	9	56	3	2	13
4	1	6	4	5	31
5	5	31	5	9	56
<b>Total</b>	<b>16</b>	<b>100</b>	<b>Total</b>	<b>16</b>	<b>100</b>

## **ANNEXURE F**

Interview transcription: Critical skills of entry level animators in the  
contemporary South African computer animation industry

**INTERVIEW TRANSCRIPTIONS: Critical skills of entry level animators in the contemporary South African computer animation industry**

**(a) PARTICIPANT 1: INJHB 1:**

**2.1 The questionnaire results have indicated that advanced skills in telling a story through performance rated the highest as the main critical skills required for entry level animators in animation studio, production house and post production with animation department (see table 1: page 7). How can this be explained?**

*- What could have been a reason why animation studio, production house and postproduction regarded telling a story through performance as more critical?*

*Well is because mainly... you know it does not matter if you are making a film or you are in the Ad industry, we try to convey a message and so you got to get the character to convey the message in the clearest possible way, so this is why. You got to tell a story properly through performance and that basically your tool you have. Basically you are an actor; you got to be an actor to animate, so...you need to be able to convey ideas through the character, to get the message across basically.*

*I don't think so, because usually cause it does not matter what industry you are in, if you ...like what is the reason, why is that character is on the screen is usually cause, is not just going to sit there and not ...you know is got the message, got some sort of thing it want to tell the audience basically.*

*- Usually animation production pipeline is divided into three departments or teams, namely creative team, production team and production management, would I be correct to say that the main creative activities takes place in the creative department and production team (including animators) execute ideas presented to them?*

*No! I don't think so, I think production team plays a quite big role in the creative process, because is a process you got to come up with ideas, like if you are an animator you come up with ideas of performance you got to decide how, you know what is best way to get this message across you obviously speak to the director and those other people too, so is like a team work , you work together, is like you are a creative team-everybody usually work together to get things to work.*

*Because what makes a good animator a good animator is, you got to come up with original ways of presenting an idea or something. That something you know, something that is interesting, original, you know...you got to bring lot of yourself into performance.*

*- What is creativity in telling a story through performance?*

*- Can you give any specific example of a scene in a film or commercial to substantiate your answer?*

*You are basically an actor, so you know that is creative, you got to develop a persona for that character because that character is just a polygon basically. So if you could look at any of the 3D movies, those animators bring a lot of characters into what the final thing is going to be, all the little twitches and nuances that characters do, those things you pick up from animators.*

*Well obviously got to read the script and then got to imagine what you need to know to make that character real, you usually got to add little extra bits for the character to look real, like how would that character basically, you know even to sit, how that character would be very straight up, would they be fugitive with their fingers, what would they do with their hands, what you do when you are not thinking what you are doing-what do you do when you are nervous...*

**2.1.1 The questionnaire results also indicated that animation computer software, character design, cinematography and editing skills scored the second highest on the score level 5. How can this be explained?**

*Basically, obviously, the software, you need to know your software when you animate is fine, but character design for animator is nice thing to do, you don't have to be able to do character design is just like added aspects. Cinematography is quite good because it is- especially cinematography and editing because, basically animation comes in film format you need to know shot to shot...it really helps.*

- What is your response to the following comment from the questionnaire?

*"The highest skills I have indicated are important, but that all depends on the area in animation the applicant is applying for, if they want to be character animators, then acting and storytelling skills are important, if they are more interested in the technical side of the animation industry, then modelling, and rendering skills are important. However, it is good to have an overall knowledge of all these things." Probe question: In your view what is technical side of the animation industry?*

*It is very good and even as an animator I would still say you need to have an understanding of cinematography and editing because it just helps set up your shots properly especially when you are working in a small studio. Is not like there is only one person who does like editing, you kind of overlap your duties and that's really helpful to study film and stuff like that as well.*

**2.2 Table 2 (see page 7) respondents to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company? -indicated that participants' views are leaning towards creative skills as being more important. In your opinion how can this be explained?-What is your response to the following comments from the questionnaire?**

- *"Depends on the position you are applying for. We need both to fulfil the clients' needs".*

*Yes is because we are in a visual industry, so say this person is brilliant, you know with technical skills stuff who does not have eye for any visual stuff, you always have a creative person sitting next to him telling him how to position stuff because if you can't see it, then is kind of useless...it got to be visually appealing and I do think you can teach, some people are more technical, technically minded than other people, but I do think you can learn to develop your eye, you can train yourself to see what, you know what is a good image, what is not. I think some people have it naturally...*

- *"Technical skills can always be caught up/taught, real creative skill not. The truth is any studio is a combination of people anyway. We hire to complement skills".*

- *As mentioned previously "Creative takes higher preference, always. You can teach creative technical skills, but it is very difficult to teach technical creative skills."*

*Technical creative skills and creative technical skills are the same thing and I think that basically what I said, you know how to do technical stuff like you can do simulations and that kind of stuff but is kind of useless to have if your all things happening and does not look nice on the screen...so that where the creative part comes in so you got to make it look appealing so I think that's where it comes. Say like our technical guys here they all like do the, like we have fluid simulations staff like that which are quite complicated, involve like programming, basically involve lots of maths and they look quite frightening to normal creative person, that's the technical things look nice on the screen and that where your creativity comes in.*

*How I see it, is that you are doing the technical staff but at same time you have to make them look beautiful, so if you are doing lighting, lighting is also technical because is like if you think of photography, photography is all about light and you go to make something to look awesome that's creative, you got to decide how the light fall, you know all that stuff...*

*But I would say is really important to teach kids to get to develop the eye when they are studying.*

**2.3 Table 3 (see page 7) respondents to the question: In your opinion and from your experience, should teaching institutions of computer animation focus more on technical or creative skills- indicated that 56% of the highest level of preference (5) thought that institutions teaching computer animation should focus more on creative skills, whereas 31% thought that the focus should be more on technical skills. Any comment on these results?**

*- What is your response to the following comment from the questionnaire?*

*In my opinion, the biggest problem is that the schools are too focussed on software literacy, and don't focus on either of these things. Artistic skills are about learning principles, technical skills are about solving problems. Both of these need to be urgently addressed. Probe question: technical skills are about solving problems, what does this mean, can you give an example?*

*I totally agree with that, but I think both things I really important and I think students should decide if they want to do technical, because there is a lot learn in that...creative side I don't know if that they have to do both, but I mean it will be great if they could I think they would have to focus on one thing, but they both really important, because you need both, artistic people and they are really technical people on teams, you cant do it without technical people.*

*As soon as you get into computer animation you solve so many problems, things break all the time that you can't explain why things don't work, why does not render, weird things happens with computer you know, so you really need, especially if you are animating, you need somebody if your rigs break, for some other reason, they are the once that do the problem solving, so you really need them.*

*More technical people usually do the rigging and which include the face, the muscles and then they would... if animating and that shape does not work for you for some reason they will solve that problem.*

**2.4 What is your response to the following summary of the results of the questionnaire survey?**

**2.4.1 Question: Do you think that the nature of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

*I think if is the company that does that has more needs more technical people, then obviously technical side will be more important, but if is a, if you need both, is always easier to teach someone technical skills than aptitude, but we have a creative outlook...you can see when image is wrong or the image is right, or what make something wrong.*

*Post production they do lot of editing and effects, they would make sure that they need technical people, need balance.*

**2.4.2 Question: Do you think that the size of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

*The only thing that I can say is that with the small company they probably highly to hire generalists, that have kind of both knowledge and bigger companies would hire people with specific skills sets.*

**2.5 What is your response to the view that students hoping to enter the South African animation industry should strive to become Jack of all trades first and specialise afterwards.**



*I suppose is always save to be a generalist at the same time you need interviews for employers looking at what you are interested in, so you would not prefer it if you want to, animate you only show us an animation reel, so we can see that this is what you are interested in, not rigging which you might be really bad doing and it will put you in a bad light...I think you need to know everything in that pipeline so you would basically, probably a good idea to know like character design, and obviously animation but then like animation principles, not just to animate on the computer, but really understanding how principles are in animation and you know them, I would probably add film and cinematography and stuff like that to little good and the angle side, the rigging, modelling and I think lighting, also technical you know, put all that in a group, as long as you know the whole pipeline, like rigging is got to do with modelling character, making muscles work and pipeline, like know the lighting, rendering, process and all that stuff. I would do it like that. Well you will have a general idea obviously of what is happening, you know you will be able to, you can model, you can do this, you can do that, but you do focus on what you are interested in.*

## **(b) PARTICIPANT 2: INJHB 2**

**2.1 The questionnaire results have indicated that advanced skills in telling a story through performance rated the highest as the main critical skills required for entry level animators in animation studio, production house and post production with animation department (see table 1: page 7). How can this be explained?**

*- What could have been a reason why animation studio, production house and postproduction regarded telling a story through performance as more critical?*

*From my experience, story is pretty much the most important part of animation, if you don't have a good story, you are not going to engage the viewers, there is no connection, people do not have any kind of ...people love telling stories, people love to listen to stories, so if you don't convey that then you just got an animation with an actor and there is no emotions; there is no way that you can connect with your audience because ultimately what you are trying to do is to communicate something. Whether you are trying to communicate something from your personal experience onto somebody or you are just trying to tell a story in order to educate...*

*Usually animation production pipeline is divided into three departments or teams, namely creative team, production team and production management, would I be correct to say that the main creative activities takes place in the creative department and production team (including animators) execute ideas presented to them?*

*I will think that creativity is not just limited to the creative execution team, I think some majority of people will assume that creativity is going to be part of the team that create elements and does all that kind of...does the work in creating the animation but I think that creativity ultimately is about solving problem and so whether you apply creativity like thinking, even if you are what they call it a suite or a production manager or something there are ways which you can use creativity in everybody's day to day's job, but that's really depends on the person, but I would encourage anyone who want to work for us to have a creative mind set and challenging any kind of problems that come on day to day basis. So a good company in fact would be creativity everywhere, not just only at the base level, people who are essentially creative.*

*- What is creativity in telling a story through performance?*

*- Can you give any specific example of a scene in a film or commercial to substantiate your answer?*

*From what I take from that question...I would say that going about it in a way that is unique, essentially having the performance. There is a lot of...like stuff that just goes out every day in the industry...stuff that are not thought about and kind of just tune out with no thought and stuff like that. So I will say that creativity in performance by looking at it and maybe spinning*

head, portraying the moment in a way that maybe people will not expect and that surprises also another way of getting people to connect because people love little bit of surprise, so that if you are creative enough you can think people would be caring...ooh! Wow! Look at the, that is really good, I never expected that, then you show a creative spin in that. The performance is different and is portrayed in a different way.

**2.1.1 The questionnaire results also indicated that animation computer software, character design, cinematography and editing skills scored the second highest on the score level 5. How can this be explained?**

- What is your response to the following comment from the questionnaire?

*"The highest skills I have indicated are important, but that all depends on the area in animation the applicant is applying for, if they want to be character animators, then acting and storytelling skills are important, if they are more interested in the technical side of the animation industry, then modelling, and rendering skills are important. However, it is good to have an overall knowledge of all these things. "Probe question: In your view what is technical side of the animation industry?"*

*Because they assist in telling a story, those are adding to the believability as such of the story. So, if the performance is not there, it is not going to carry the story and people will become disinterested and as we said earlier they will have no connection cause what would be believable, you kind, you want to be involved with the character. If there is that sense of like realism connection and that is how performance is carried across. People will lose interest and the story will fall flat.*

*I would say we split up, we will have illustrator or a designer develop the character then a rigger creates the skeleton for the character separately animator. In smaller companies like us sometimes those roles do overlap, that ideally you want somebody who kind of know their job and a quite specialist...*

*I would say character rigging is definitely more technical because of the kind of maths and...lighting as well as, although that's two sides of the coin because you have quite artistic and yet you have to be very technical and knowing the software and kind of fine tuning and so lighting and rendering is like one thing, itself is very artistic, very technical, I would definitely say animation is the least technical cause you just basically moving around stuff... Animation is definitely a feeling and I would say more artistic.*

**2.2 Table 2 (see page 7) respondents to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company? -indicated that participants' views are leaning towards creative skills as being more important. In your opinion how can this be explained?**

- What is your response to the following comments from the questionnaire?

- *Depends on the position you are applying for. We need both to fulfil the clients' needs.*

*Taught creativity at tertiary so that kind of, like inherent like characteristics of a person if that's show high level of creativity you are a winning ticket already. You can always teach technical skills, you can always skill people up, but to try to teach them how to think in a different way is a lot harder and time consuming and it is not always guaranteed. I would definitely say bring someone that is creative, they have got the skill sets already and then if there is technical skills, senior people already would be able to help them and guide them along...*

- *Technical skills can always be caught up/taught, real creative skill not. The truth is any studio is a combination of people anyway. We hire to complement skills.*

- *As mentioned previously "Creative takes higher preference, always. You can teach creative technical skills, but it is very difficult to teach technical creative skills."*

*Playing words around is not helping, is not making anything clear...you always got to have both. You can't get into this industry especially in South Africa, obviously here far more specialising. I would say you generally have to be a jerk of all trades, but you can specialise in one area.*

**2.3 Table 3 (see page 7) respondents to the question: In your opinion and from your experience, should teaching institutions of computer animation focus more on technical or creative skills- indicated that 56% of the highest level of preference (5) thought that institutions teaching computer animation should focus more on creative skills, whereas 31% thought that the focus should be more on technical skills. Any comment on these results?**

- What is your response to the following comment from the questionnaire?

*In my opinion, the biggest problem is that the schools are too focussed on software literacy, and don't focus on either of these things. Artistic skills are about learning principles, technical skills are about solving problems. Both of these need to be urgently addressed.*

Probe question: *technical skills are about solving problems, what does this mean, can you give an example?*

*You do need to have level of technical skills as mentioned early but creative skills are paramount. I would say that...I think kids need to be taught from entry level to high school, you need kind of start teaching creativity even if is like a half hour subject per week, people need those skills and they are never taught them but everyone just need to think out of the box and I think is through your whole life...thinking, unique and actual we are not taught how to think...It don't just happen. You just basically taught skills that you need to acquire and not how should approach problems and stuff like that from a high school level upwards those skills are valuable to everyone.*

*I would not say technical skills are about knowing what to do, but knowing the procedures, what kind of outcomes is? What are the specific details of what you need to achieve, but you need creativity to solve problems and thus not necessarily technical skill, when you have a problem is generally because something did not go right and X amount of time technical skills will not let you sort you sort problems when you get to say I want to propose the situation like we are doing character rigging, if you try...this way or... and does not work even though you have those skills, you know how to do it this way, you not creative, you have worked around the situation and use other technical skills maybe creative technical skills this guy is talking about to solve a problem, then you either not going to solve the problem...even with X amount of technical skills, so you kind of ...you need to apply your technical skills creatively. Basically, that come the idea for, say transformers and then because of all the technical restrains of creating such a realistic problem...technical people have to overcome that. Basically they need to know different kind of skills in different programmes to put it together, they are going to have to think in a manner that they can actually solve this problem...That's basically it, developing technical aspect to solve a creative problem.*

**2.4 What is your response to the following summary of the results of the questionnaire survey?**

**2.4.1 Question: Do you think that the nature of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

*Yes definitely, is basically also going to work on business to business function where as we might have two great creatives and we just need a bunch of technical people from majority of time...those additional technical people to assist, per on a company basis, and industry...animation houses, post production houses you may find*

**2.4.2 Question: Do you think that the size of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

*I mentioned earlier that in smaller companies you have a number of roles, your skills sets need to be little bit more varying, while in large companies you can specialise more.*

## **2.5 2.5 What is your response to the view that students hoping to enter the South African animation industry should strive to become Jack of all trades first and specialise afterwards.**

*I totally agree, and is because the number of studios in South Africa and the size of the industry you find that there is a lot of smaller companies, a lot of small companies whereas not so many large companies in order to back up what I said early is that you generally have both skills, essentially the generalist is...if you get into a position like the company where there is team and you are able to distinguish roles, that's when you specialise and if you are getting into industry be aware that you might be that first three years of entering the industry, in that case you might need to know variety of things and going to specialise as an animator that is not going to serve your career in a good stand, is thus why I would rather go as a generalist, then you can always specialise in what you like.*

### **(c) PARTICIPANT 3: INJHB 3**

#### **2.1 The questionnaire results have indicated that advanced skills in telling a story through performance rated the highest as the main critical skills required for entry level animators in animation studio, production house and post production with animation department (see table 1: page 7). How can this be explained?**

*- What could have been a reason why animation studio, production house and postproduction regarded telling a story through performance as more critical?*

*I think what is also important to bear in mind when you are doing this is that lot of the times we don't deal with storytelling animation as much as we deal with a simple communication of an idea through animation, very few studios are privileged enough to actually be telling full blown stories, obviously, but having said that critical idea in a commercial for instance communication skill; that's critical skill you only have amount of time to make that point, that critical communication you are actually right, the performance to tell that story which is only one point still has to be very good, so the performance has to be clear and distinct and convey that idea in a short space of time, so I think that would be the reason, because many of our studios in the country are not full blown storytelling studios, they are commercial studios, where client, an advertiser has one main idea that has to be communicated in 30 seconds, is critical that you have the skill to convey that communication through that performance when it comes to animation.*

*- Usually animation production pipeline is divided into three departments or teams, namely creative team, production team and production management, would I be correct to say that the main creative activities takes place in the creative department and production team (including animators) execute ideas presented to them?*

*That is right, but again that in those studios afford to have those kind of clear lines of division between creative production and management, many departments that...all blur into one, excerpt maybe for management side of it, but the creative and production are very closely linked, often same people in many studios in the country and what would typically happen, her for example is that advertising agency will bring a creative idea, which they might or might not thought it out through one hundred percent, or they might have a seed of an idea, small idea or just a beginning of an idea and then our creative and production team would then take over that and flash it out and try to communicate but the way we have it the notes is that it appears that they have a creative team-production team that I can say those studios are lucky enough to have that is often the same team.*

*- What is creativity in telling a story through performance?*

- Can you give any specific example of a scene in a film or commercial to substantiate your answer?

*It is a difficult question, I mean board that come with ideas especially in storytelling, character storytelling like you know and I must say those pieces are quite rare, if people are doing character work but it is not much as you will think and I guess the creativity in story telling for me it will be more to be able to create unique characters in that sense where we have characters that you can relate to, characters that make us laugh, characters you can identify with, creativity certainly comes in play in that area in the design of those characters but when it comes to performance of those characters-animation is creativity to start with, it is quite difficult question because I think animation in its own nature is creative, is a difficult thing because you have to be creative for the animation performance to work well in order to tell a story well. They are all tight linked; animation is a creative work so that would be my own answer. I think any animator has to bring certain amount of creativity to the whole process anyway either designing the character or the actual animation.*

*There is improvisation in acting, but there is maybe not, I mean it is creativity...is tough because it is creative work but it is all...so being smart in a way that, that particular ideas you are trying to convey in the animation although it might...animation from scratch is acting because what you often find is that animators would film themselves or they would act the piece themselves to be able to try figure out the best solution for that moment and in that acting it is the nature of creativity*

*They would be that creative approach to that brief and then of course the whole... when you are going through that brief a guy walking from point A to B, the whole bunch of questions are going to come into play, why is he walking from A to B, how is he feeling. They are whole bunch of things that will come in play that could be on a creative brief, could be a brief that interpreted creatively by the animator.*

**2.1.1 The questionnaire results also indicated that animation computer software, character design, cinematography and editing skills scored the second highest on the score level 5. How can this be explained?**

- What is your response to the following comment from the questionnaire? *"The highest skills I have indicated are important, but that all depends on the area in animation the applicant is applying for, if they want to be character animators, then acting and storytelling skills are important, if they are more interested in the technical side of the animation industry, then modelling, and rendering skills are important. However, it is good to have an overall knowledge of all these things. "Probe question: In your view what is technical side of the animation industry?*

*Well I think you know clearly computer animation has become a skill that nowadays you can't do without, you have to have skills in computer animation to be able to be a computer animator, so that is a given, it is not a...although you can still be a drawn animator, nowadays being able to use computer software to animate is a given, you have to be able to do that, although that does not detract from obviously the traditional skills of animation. Again character design has to score high or has to be important because it's intrinsic to have identify with that character, so having said that poor character design, if you have a brilliant animator with poor character design those two things can't live together. You have to have... both of those two things have to be strong, they can't, the one can't exist without the other, the...if I showed you a still image of a character and you would either immediately identify with the character, you either like the character or you would not like the character, so...any animator...immediately, if I start making that you like the character...you are really going...the animation already does have to be all that good, but the appeal of the character is actually paramount because you would see a movie...this character has to move but I love what that looks like.*

*Animator do design characters, yes except that we have one person but is a separate person, so we have one creative person who has that as a specialisation skill but he himself also animate, but then we have other animators who won't do character design because is not their strength, so if the question is does the animator have to have both strength-it does not, it could and what happen in film there is a character and concept design team and the animators are separate team, so those two things they are clearly separated skills or positions, exactly in the bigger studios obviously. Cinematography works similarly kind of way, if I shoot my film or short film or commercial, cinematography is very, very important and editing again as well but all those four things separate skills sets, they could go to separate people.*

*Absolutely, because especially in South Africa this kind of studios what happens is that to get a generalists, a guy who says I can do this and this, a little bit of everything try to make a product to look at least half decent of above certain standard.*

*That is a very good comment and that is about...what turns to happen is that you kind of have animators, storytellers have the technical teams that takes care of rendering, but it come down to the computer animation. Computer animation has driven that skills sets or separation because it takes certain kind of person to do animation...but it takes another kind of person to take what he is done.*

*It is computer animation that created that in the olden days guys drew their animation, he draw it and he finish it although he would have an inker or paint person finishing it but, if he wanted to, himself could have finished it, that happen where again you get a generalists who will take care of all of that, but in bigger studio...if we are talking film animation then those departments are all very separate. There will be a guy who models, there will be a guy who rigs it, which putting all the controls for character, that goes across to the animator to tell a story and animate the scene, then across to lighting and rendering. Rendering person will take care of it and might even go to compositing where effects and layering of the shots done to finish the shots, so it could easily go through like six departments, so technical side could be more of the modelling, the rigging, the lighting and rendering, that would be the technical side.*

**2.2 Table 2 (see page 7) respondents to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company? -indicated that participants' views are leaning towards creative skills as being more important. In your opinion how can this be explained?**

*- What is your response to the following comments from the questionnaire?*  
*- Depends on the position you are applying for. We need both to fulfil the clients' needs.*  
*- Technical skills can always be caught up/taught, real creative skill not. The truth is any studio is a combination of people anyway. We hire to complement skills*  
*- As mentioned previously "Creative takes higher preference, always. You can teach creative technical skills, but it is very difficult to teach technical creative skills."*  
*We have exactly the same requirements here; basically because one does not exist without the other...we hire to compliment skills absolutely. So what they are saying is quite difficult to teach creative person technical skills oh!! Sorry is very difficult to teach technical person the creative skills because creativity is a kind of an inherent skill, something you are born with, something that, although technical skills are, technical thinkers are like that too, what they are trying to say is and I would not agree with this because through technical thinkers, is pure logical, creative people do not have that, so where this quote is saying you can teach a creative person technical skills you can to a certain degree, get that person to get ...but in big productions, like really serious film productions that creative person would never be able to...taught the kinds of skills that, let's say for instance in a film like The "Incredibles" or something like that, they got water simulations for instance, that person...creative person would never go near that staff because is really that technical and its semi-correct but I do not agree with it 100%. I think in the big studio those two skills they are different people, but*

*in our kind of world in this commercial short turnaround times those creative people can certainly be taught technical skills that they would need for them to get the bar.*

**2.3 Table 3 (see page 7) respondents to the question: In your opinion and from your experience, should teaching institutions of computer animation focus more on technical or creative skills- indicated that 56% of the highest level of preference (5) thought that institutions teaching computer animation should focus more on creative skills, whereas 31% thought that the focus should be more on technical skills. Any comment on these results?**

*- What is your response to the following comment from the questionnaire?*

*In my opinion, the biggest problem is that the schools are too focussed on software literacy, and don't focus on either of these things. Artistic skills are about learning principles, technical skills are about solving problems. Both of these need to be urgently addressed.*

*Probe question: technical skills are about solving problems, what does this mean, can you give an example?*

*I mean I would agree with that. I think that's right, I mean we have seen lot of schools over the last couple of years producing people that are neither very good at creative nor technical. They kind of stuck in the middle of...is average in both departments if I could put it that way. My feeling personally is that we should start developing the kind of thing maybe where, let's say first year all students do the same course, they learn certain skills, they learn animation skills, they learn skills altogether, in a 3 year course- after that first year split that class and we say hands up to those who want to be animators and hands up to those who want to be technical department, and we then do a quotas and then we focus that tuition for that skill, this person here is not an animator he does not want to know, he wants to know a little about technical staff but his first year has grounded him in those technical enough. Technical skills to understand if he had to talk to other people, how he could convey what he need, but there is a serious focus from year two on a particular skills sets. So there is an indication of this person. This person is more likely to be a good animator and he can chose to do that. Technical skills are about solving problems, if I took in character rigging for instance say a rigger he has to rig, he had to put controls into a character model to enable it to move, there are certain things for instance like elbows, shoulders that are very complex mechanism in the body and he might develop a solution to a problem for shoulder region for instance, so that when animator moves that arm there is this very smooth flow, it feels like a shoulder moving, it does not feel like a bit of tube stuck into the side of the box or something, you know, what I mean, that would be the kind of technical problem solving just in character work, but then there are multitude of technical skills, for instance you are doing waterfall, river stream flow, those technical skills go into the ram of massive process...how do I first create a river, how do I get it to look realistic, how do I render it? How do I render things of...just massive set of data.*

*There is no system that does this easily, these guys they have to come up with a system to solve the problem of how do I get the top layer to feel like a skin, driven or pushed by muscles underneath, that is technical problem solving when comes to animation.*

**2.4 What is your response to the following summary of the results of the questionnaire survey?**

**2.4.1 Question: Do you think that the nature of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

*Look, I think so, I think it could be because, like I said, like for instance this, here for instance we have post production facilities and so I would go with that. I would say that is correct, where there is the full blown animation studio of which they ant many but maybe like Triggerfish which is doing film work in Cape Town for instance then that would be the first one that will make sense to me*

**2.4.2 Question: Do you think that the size of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

*I would disagree with that, I would say that the technical skills in large company are equally as important. (Interviewer: remember here they refer to junior). If they were hiring an animator, yes I guess that would make sense, they won't hire a technical person but they will hire an animator... that would make sense because they would be looking in a larger, they would be looking for a person who specialise or animate.*

**2.5 What is your response to the view that students hoping to enter the South African animation industry should strive to become Jack of all trades first and specialise afterwards.**

*This question was not asked for this participant because he elaborated a lot on the answer for this question under questions 2.1 to 2.2. This was done in order to avoid repetition.*

**(d) PARTICIPANT 4: INJHB 4**

**2.1 The questionnaire results have indicated that advanced skills in telling a story through performance rated the highest as the main critical skills required for entry level animators in animation studio, production house and post production with animation department (see table 1: page 7). How can this be explained?**

*- What could have been a reason why animation studio, production house and postproduction regarded telling a story through performance as more critical?*

*Well, if you take a simple ball and you animate the simple ball or the sphere you still have to get a character out of that. That is animation and that is not very technical thing, but you need character, you cannot do that without performance, that's why I said that. That is a good explanation of it, you know what I mean if you have to give a sphere a character, that's why?*

*- Usually animation production pipeline is divided into three departments or teams, namely creative team, production team and production management, would I be correct to say that the main creative activities takes place in the creative department and production team (including animators) execute ideas presented to them?*

*Yes that's correct*

*- What is creativity in telling a story through performance?*

*- Can you give any specific example of a scene in a film or commercial to substantiate your answer?*

*I mean that's very similar to the ball thing, that is a creative thing, is a study of our mannerism and stuff would work, you know what I mean, to give a simple thing a character or life or give little animation character. I don't know if you have seen Puss and Boot movie. There are two cats, both want to go and steal the beans and the whole thing is not a dialogue driven, they just basically chatting to each other with mannerism.*

**2.1.1 The questionnaire results also indicated that animation computer software, character design, cinematography and editing skills scored the second highest on the score level 5. How can this be explained?**

*- What is your response to the following comment from the questionnaire?*

*"The highest skills I have indicated are important, but that all depends on the area in animation the applicant is applying for, if they want to be character animators, then acting and storytelling skills are important, if they are more interested in the technical side of the animation industry, then modelling, and rendering skills are important. However, it is good to*



have an overall knowledge of all these things. "Probe question: In your view what is technical side of the animation industry?

*If you think about how are you going to sell animation to your client, you need to know those skills to tell the story, otherwise...no matter how good animator you are, if you can't tell a story properly with camera moves then is not going to work, is never going to work for the client. You know what I am saying.*

*Yes, in our facility we would look at what we need, you know what I mean, is not always animators...is separated is more technical, if is a small company you will have both skills in one person, when you get to bigger companies you start looking at specialists, people who just do animation or just do particles so that why I said that. That's what companies look for. Technical for me is creating particles, simulation, motion capture, rendering, camera tracking- that's for me more of technical side of the animation industry.*

**2.2 Table 2 (see page 7) respondents to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company? -indicated that participants' views are leaning towards creative skills as being more important. In your opinion how can this be explained?**

- What is your response to the following comments from the questionnaire?
- Depends on the position you are applying for. We need both to fulfil the client's needs.

*It depends on the position you are applying to...you need both that's absolutely correct because I mean you have a big commercial and there are hundred characters in the commercial...technical guys to rig, you get creative guys to build these characters, you get your technical guys to rig the characters for them, to track the camera and at the end you get the creative guys again to animate them, so is a complete use of both sides*

- Technical skills can always be caught up/taught, real creative skill not. The truth is any studio is a combination of people anyway. We hire to complement skills.
- As mentioned previously "Creative takes higher preference, always. You can teach creative technical skills, but it is very difficult to teach technical creative skills."

*Yes...most creative people I have worked for, they got a feeling for something, they know that's the right way to do it. So they just need to learn technical skills to implement them, but somebody who is very technical is very hard to extent the feeling from something or emotion, how to convey emotions in animation. Or how to make something beautiful or very hard to explain...you know what I mean....knows what this is has to be because...it works.*

*Yes that what I have just said, you can't teach, is very hard to teach a technical person to...what is beautiful drawing, you know what I mean-is easy to tell a creative guy...okay you put a bone from here and here that's make this thing to move, is easy but to teach somebody this beautiful drawing it shows emotions is very hard.*

*There is a fine line between them lot of guys reach over that, but you talking to a pure technical guy he is not going to be able to understand the creative beauty about something. I know is a difficult one to explain...*

**2.3 Table 3 (see page 7) respondents to the question: In your opinion and from your experience, should teaching institutions of computer animation focus more on technical or creative skills- indicated that 56% of the highest level of preference (5) thought that institutions teaching computer animation should focus more on creative skills, whereas 31% thought that the focus should be more on technical skills. Any comment on these results?**

- What is your response to the following comment from the questionnaire?

*In my opinion, the biggest problem is that the schools are too focussed on software literacy, and don't focus on either of these things. Artistic skills are about learning principles, technical skills are about solving problems. Both of these need to be urgently addressed.*

*Probe question: technical skills are about solving problems, what does this mean, can you give an example?*

*I think both are equally important technical and creative skills, I think both are equally...I think that is completely true because they teach literacy in software but they don't teach how to use that in the real world environment, they don't solve problem with it, so they would know how to make the sphere but not how to make that sphere fit into environment...they can make a sphere in software and the sphere but now I want you to put that sphere into shot environment...shot to the camera, that's more important than making the sphere, anyone can make the sphere, you can find it in any...to make a sphere but not how it fit into the environment. To make a sphere is easy because you press a button, but actually to put the sphere in the environment it takes some skills, because now you think, what is the ambient lighting/ is it dark? Is it light? Is it blue shade? The balance of the film- you know what I mean, is there grain or not? All those kind of things which are more actually important to learn and to implement on that sphere. Your thoughts the school should teach basic skills but push it further...put into the real life environment.*

*Exactly what I have just said as well, how to put anything to a real life environment or let's think of another one...if you have to put a car that is crashing into a speed- you know what I mean- how are you going to do that, what are you going to do? Are you going to be tracking mark, so is your camera moving across the road? How are you going to do the whole thing...*

*Behind the scenes of the making of Shrek 1, yes but that kind of stuff is heavy and we don't use a lot in South Africa because our projects are not for long term, we don't do lot of animation movies, we do more of commercials and stuff, so kind of stuff we never built tools like that for our real life environment but it is a good example, solving problems will be like how do you change a man walking into water that's believable, that kind of stuff...*

*Our industry is not that big we don't...we use what the software's got because we don't have time to spend two years developing simulations for a commercial, that we only have two weeks to finish-you know what I am saying-I mean is always lovely to see what kind of stuff these guys do but in the real world environment you have to solve problems so quickly and on your feet. That's hard to explain, it is almost need experience...you know what I mean.*

*Those kinds of things we still do because are commercial...*

## **2.4 What is your response to the following summary of the results of the questionnaire survey?**

*I was quite interested to see what your graphs are doing to show that smaller companies have more equal technical and creative skills but those bigger companies they looking for more creative skills. That's very interesting because you can see why is that because small company does not have a specialisation, they don't have people specialising in one area-you know what I mean, they need someone that is a generalists, they need to rig, texture even everything, when you get to a bigger company you start working in a work flow basically you have people that do lighting especially overseas, we don't do it a lot in South Africa but our bigger companies are started to move that way like Black Ginger in Cape Town, where they have guys specialising in certain areas...*

### **2.4.1 Question: Do you think that the nature of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

*Yes, definitely right*

**2.4.2 Question: Do you think that the size of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

*Yes it is definitely, it does make sense you can't hire 20 people when you are a small company, you just started you need multi-skilled people in everything because one day you will be doing animation, next week you might rig the character, week after that you are going to do camera tracking, explosions. So that makes a smaller company to look for somebody who is a generalist.*

**2.5 2.5 What is your response to the view that students hoping to enter the South African animation industry should strive to become Jack of all trades first and specialise afterwards.**

*I completely agree with question 2.5, if you want even if you want to be a specialist later in your life move overseas and become a specialists you will still have to start as a generalists because we don't have a market big enough to be a specialised at the beginning and lot of those animators being specialists but they...there is a guy called Brain Goodwill who used to work at Refinery, he now at Pixar, he is a specialist, he became a specialist in the end. I mean he worked in Avatar, all those kind of things, he is a specialist in "Nubbin" which has more particles, simulations...all those kinds of things...yes because our company you are a generalist, it makes you get job easier and later you specialising in something that really, really love to get yourself started you know lot of things...*

**(e) PARTICIPANT 5: INCPT 1**

**2.1 The questionnaire results have indicated that advanced skills in telling a story through performance rated the highest as the main critical skills required for entry level animators in animation studio, production house and post production with animation department (see table 1: page 7). How can this be explained?**

*- What could have been a reason why animation studio, production house and postproduction regarded telling a story through performance as more critical?*

*I think, since a lot of institutions teach software and the main focus is on the software they are getting out generalist instead of animators so when you say animators you mean character animator or are you speaking in general term? Okay cool in general terms I think institutions can start focusing on software because, I mean it takes very long time to get used to the software and actually know, cause is divided in so many little aspects, I mean you have your lighting, you have your animation part, you have your rigging, you have your texturing and it consists of lot of different aspects, so and 3 years is...institutions usually teach software in three years but they don't specialise, so as a, out of a generalists point of view is good for an institutions to teach the software but then there is a massive gap between the creative and the technical, so you find a lot of institutions who just push out technical generalists but they have no idea what film is all about, they don't understand what story telling is and so I think advise I can give to institutions is actual just focus more on film and art. The art on how to mingle the two.*

*You see that's more of animation point of view, so the thing is, if you look at commercials, especially commercials that are long forms actually coming up in South Africa. Commercials you can get away with just moving object around, just, you know get something that looks okay and looks fine for the client, you know he is happy with his OMO box jumping around, but I think nowadays the industry is rising now and long form is taking kind of step forward, so if you look at Triggerfish we actually on our second feature film and we have 23 animators, senior animators, and we have a lot of junior animators coming in from the commercial background and they so used to just pushing out these average quality work that they didn't really learn anything about story and posing and acting for example, so that's why I think there is a gap there, where we will like to focus on teaching this people to actually to become actors as animators because that is what they are. so and that involves lot of film*

*study, acting study, theatre work, theatre sport, miming, and those kind of things, cause just actually getting up from his chair acting out his own shot, learning what it takes to bring the character to life.*

*Well coming from my background, I have been dealing with, I have only worked on a lot of narrative based productions, so every little thing you do specially now if look at long film industry you pretty much from a character to a shot, to a scene, to the whole film its all about the story and that's why we focus on strong storytellers cause, if you think about pitching a scene, like animators have little teams and the way we work is you bring out, you say okay cool, this the scene, this is what needs to happen, this a general feel we have to get out, this little story we have to tell in this scene for the whole film, so they go out and pitch, so they go and sit, like draw out thumbnails, they acted it out, you know so that's where is critical to have a good sense of storytelling because now you pitch back to the director, animation director and say, you know what, okay is cool, this is what want to achieve and this how we are going to achieve it, this is the performance we are going to get out of it, and now this is where strong acting is coming in play, cause now you can look and say I don't like that facial expression you have there, I like the performance, the posing you did in that video clip and sometimes we find lacking in the guys who don't act it out they are the ones they struggle the most, that's where is really important to have a strong sense of acting and performance, and I think that's where storytelling comes in, cause strong storytellers make strong actors, strong actors make strong animators, and that's how it rolls down.*

*- Usually animation production pipeline is divided into three departments or teams, namely creative team, production team and production management, would I be correct to say that the main creative activities takes place in the creative department and production team (including animators) execute ideas presented to them?*

*No, I think in some cases, some studios animators especially junior don't have a lot of say, because they are...it depends on the production...production house, commercially like you are in quick turnaround of productions so you have commercial that you only have certain amount of people working on it and then you have your creative directors and those guys usually have the say, and say this is exactly want, we don't have time for everybody's input so therefore were have to just get this out and everybody just have to obey. In the long forms is more open to everybody's input, especially here in Triggerfish we have juniors pitching like I said, pitching ideas to the director, the director is open to the suggestions, how it works is we storyboard from the beginning straight through with a storyboarding team but the animators are not involved yet they are busy doing previsualise and animatics, so when it get to previsualise these animators they take this storyboard and then they play with it, they implement the 3D part of it, so that takes all the characters just very basic poses and pose in environment to match the storyboard. This is where it gets more creative so we have lot of juniors coming here and helping out in previsualise and when an animation starts, thus where we leave, we still leave it open, we have a base to work from but we have everybody in the team having an input, pitching his own ideas, drawing out thumbnails, pitched to the director and the director says yes, no I don't like that so everybody pretty much equal in this situation, leads, juniors all work together. At triggerfish we really open to everybody's suggestions even if you are not in the creative team, like we have story development workshops where everybody just write stories, people from the production, producers actually wrote stories and some of them actually won, which we want to develop into a short film or feature film, so we leave that open to everybody cause we kind of believe that everybody has ...can actually have a strong story and strong opinion about something.*

*- What is creativity in telling a story through performance?*

*- Can you give any specific example of a scene in a film or commercial to substantiate your answer?*

*I think creativity in telling a story through performance is more like, if you think about acting, is about the art of performance and telling the story through your character, if you think about*

*it, you don't even need, like a voice recording or voice over to get that done I mean, is about more like miming skills, so if you have comic timing and you can tell a story but just with one character you know, expressing and telling a story through his body, with his body, I think that is important and that is Charlie Chapman you know so if you think about it, if an animator can do something like that with something simple it is lot stronger than having this super complex form that does not work, I think that takes lot of creativity to be able to do that, that's not simple and that's where a lot of people need to work together and come with all these skills and stuff like that, you make it funny or really sad and it is not east stuff and I think that's where creativity comes in play.*

### **2.1.1 The questionnaire results also indicated that animation computer software, character design, cinematography and editing skills scored the second highest on the score level 5. How can this be explained?**

- What is your response to the following comment from the questionnaire?

*"The highest skills I have indicated are important, but that all depends on the area in animation the applicant is applying for, if they want to be character animators, then acting and storytelling skills are important, if they are more interested in the technical side of the animation industry, then modelling, and rendering skills are important. However, it is good to have an overall knowledge of all these things."*

*Well dealing with lot of departments opens it up to, you know to debate, cause...I think personally, I think being a generalist personally, like I evolved from being just a generalist to an animator, but having an understanding of all other aspects of film helps so much, like knowing how staging works, cinematography, camera work, the detail of layout, for example lighting, how light might fall, that is going to influence my performance and how light will work with my skin so to me is like you can break it down and say this is important for an animator, but I think as a generalists I learned from everybody and everything and that actual makes me a stronger candidate for animation director or animation lead or supervisor and same goes for lighting artist, same goes for an editor, cause this guys if understand animation they understand performance and timing, then it helps the department as well and going forward, learning more and staying ahead...*

Probe question: In your view what is technical side of the animation industry?

*One thing obviously software skills, almost...well 90% of the time an animated feature film industry your software skills, the software that you going to be working in is quite important, I mean if Softimage, Maya, Studio max, whatever I think need to have good understanding of that software, even though is not your main focus, performance is more important than anything else, if you don't know how to work the software you are not going to be able to get your results. Modelling, all those things are, if you learn software, if you go to an institution you will learn all those things, but animation is also one of those things takes a life's time to learn and institutions don't really focus on the principles, have to cover all these things and when it comes to animation its lacking because they don't have that time, if you call yourself an animation school then you have to teach animation, that's just my opinion. If you are a generalists school will teach generalists people, thus why Animation Mentor kind schools are serving good because they provide all rigs, they provide all the technical things for animator to just take that and perform, but they are not strong in software skills.*

**Table 2 (see page 7) respondents to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company? -indicated that participants' views are leaning towards creative skills as being more important. In your opinion how can this be explained?**

- What is your response to the following comments from the questionnaire?

- *Depends on the position you are applying for. We need both to fulfil the clients' needs.*

- Technical skills can always be caught up/taught, real creative skill not. The truth is any studio is a combination of people anyway. We hire to complement skills.
- As mentioned previously "Creative takes higher preference, always. You can teach creative technical skills, but it is very difficult to teach technical creative skills."

Yes, I do agree, but I believe, obviously, for example if you look at rigging department, this is something we always battled with and in lot of studios is that you get lot of programmers or people with. They are highly skilled technical artists or people and we always call them rocket scientists because they can build complex stuff, but it takes a creative to keep it simple, for creative to be able to work with it, it is hard to make something artistically, I mean for example he will make something that looks impressive but it is not pretty, but for him to see that is, you know, is really difficult but for creative will still learn to be technical that's possible cause he comes from creative background so he put all his experience of aestheticism to that and he can still learn the nulls and you know all technical things, obviously you, need, in a big studio you need all people, analytical thinkers, your creative thinkers and they all complement each other and learn and build strength from each department.

**2.3 Table 3 (see page 7) respondents to the question: In your opinion and from your experience, should teaching institutions of computer animation focus more on technical or creative skills- indicated that 56% of the highest level of preference (5) thought that institutions teaching computer animation should focus more on creative skills, whereas 31% thought that the focus should be more on technical skills. Any comment on these results?**

- What is your response to the following comment from the questionnaire? *In my opinion, the biggest problem is that the schools are too focussed on software literacy, and don't focus on either of these things. Artistic skills are about learning principles, technical skills are about solving problems. Both of these need to be urgently addressed.*

*Like I said before your, if you have a school that teaches art, art institutions is different from animation school, or when I say animation school I don't mean the animation school(situated in Cape Town) because art institutions, if you look at Open Window School of Design and Visual Communication, they don't only teach animation, they focus on design, they would focus on illustrations all those aspects of film, photography and all those subjects help each other subject, which creatively makes you a stronger candidate, so coming to a studio like Triggerfish, if you have good storytelling skills, if you have a good eye for detail, if you have a good sense of lighting, all those things good in terms of colour, design, composition, cinematography, those we look at them and say yes we can work with this person, he might need a bit of technical education but we will provide that, you know so spending three years at the institution, coming out of that but have no artistic knowledge or a sense of it, those guys pretty much waist three years of their lives and a lot of money, because for them to find jobs is difficult because they will...how do you put yourself as being good, technical person, its...you have to be at the job to prove that, but you can prove yourself as a real great artist.*

Probe question: *technical skills are about solving problems, what does this mean, can you give an example?*

*Like I said before, I mean in our industry there is a quite lot of technical problems, I mean you deal with rigging, you deal with rendering and lighting and all those things, character...to make a character to perform rigging should to be able to have the rig you need. Riggers and those guys are they guys who are the rocket scientist. To build, you know this whole infrastructure of that rig and the same goes with any software, editing knowledge, I mean you will work with software and you need to know all the short cuts all the...that takes experience to get and that is a certain creativity as well, cause you get strong performance but these guys can only perform, then you only have these guys with better understanding of the technical aspects of the production and they are usually the guys who help out. So they help to fix a problem and solve the problems technically because guys need character to run*

*from this side to that side and it takes, is not only a creative thing because we dealing with a lot of software problems, we need people to fix that.*

*That's pretty much our daily job here, if you have a concept artist, he pumps out these concepts...this is what we want to achieve, he design characters and the technical guys is up to them to make this work, so but for us, for technical guys to be able to think technically, so it is achievable, so both help each other, so technical helps artistic and artistic help technical to achieve, they have to go hand in hand, otherwise is just not going to work.*

## **2.4 What is your response to the following summary of the results of the questionnaire survey?**

### **2.4.1 Question: Do you think that the nature of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

*Yes, definitely, I think so like I said if it is a fast turnaround, then you need creative thinkers, guys who can think outside the box very quickly, they can make decision and apply it. In long production, there is still time for growth and development and that's why it is still feasible to get somebody that's not, maybe not as creative or, but he can technically help out or slowly growing into his position.*

### **2.4.2 Question: Do you think that the size of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

*I do agree with the graphs' results.*

## **2.5 2.5 What is your response to the view that students hoping to enter the South African animation industry should strive to become Jack of all trades first and specialise afterwards.**

*Well at the moment in South Africa I don't know how many long form studios are, is only Triggerfish, Jock of The Bush veld made a film recently and I don't know if they are still a long form production, but at the moment the industry is still small and that requires you to be a generalists, a junior animator will still, he will still work on a lot of small productions, quick turnaround and that's going to require an understanding from taking a project from start, from character design straight through the final render and to be able to do that you need to understand every little aspects of the production and that makes you strong base, in terms of not only being in South Africa but any-where in the world, cause a lot of studio overseas have the luxury of bringing up guys who specialise in certain field but those guys who specialises in certain field, but these guys usually just stay in that field, an animator will always be an animator but that person won't be a supervisor of many people, maybe in an animation, but not in different department. Being a generalists I think, I believe, well lot of my friends and colleagues usually go from being a generalist to a specialist like a foreign country and be a supervisor there, because they have an understanding of everything and we had to go through everything in our country, since we don't really have lot of options, but in long form that gives you a room for saying, okay, cool I like animation obviously the quality has to be a lot better so you need people to specialise in that, they are not the master of, Jerk of all trade, but they are master of one, because that is the people that we ultimately want to have in a long production line.*

## **(f) PARTICIPANT 6: INCPT 2**

### **2.1 The questionnaire results have indicated that advanced skills in telling a story through performance rated the highest as the main critical skills required for entry level animators in animation studio, production house and post production with animation department (see table 1: page 7). How can this be explained?**

- What could have been a reason why animation studio, production house and post production regarded telling a story through performance as more critical?*
- Usually animation production pipeline is divided into three departments or teams, namely creative team, production team and production management, would I be correct to say that*

the main creative activities takes place in the creative department and production team (including animators) execute ideas presented to them?

- What is creativity in telling a story through performance?

- Can you give any specific example of a scene in a film or commercial to substantiate your answer?

*The sound decibel is on mute- the cause of the problem is unknown.*

**2.1.1 The questionnaire results also indicated that animation computer software, character design, cinematography and editing skills scored the second highest on the score level 5. How can this be explained?**

- What is your response to the following comment from the questionnaire?

*"The highest skills I have indicated are important, but that all depends on the area in animation the applicant is applying for, if they want to be character animators, then acting and storytelling skills are important, if they are more interested in the technical side of the animation industry, then modelling, and rendering skills are important. However, it is good to have an overall knowledge of all these things."*

*Probe question: In your view what is technical side of the animation industry?*

*The sound decibel is on mute- the cause of the problem is unknown.*

**2.2 Table 2 (see page 7) respondents to the question: Are technical skills (computer use) or creative (conceptual) skills considered more critical in your selection process for junior computer animation positions in your company? -indicated that participants' views are leaning towards creative skills as being more important. In your opinion how can this be explained?**

- What is your response to the following comments from the questionnaire?

- *Depends on the position you are applying for. We need both to fulfil the clients' needs.*

- *Technical skills can always be caught up/taught, real creative skill not.*

*The truth is any studio is a combination of people anyway. We hire to complement skills.*

- *As mentioned previously "Creative takes higher preference, always. You can teach creative technical skills, but it is very difficult to teach technical creative skills."*

*Okay I think, they are talking about the creative as a person, so you can teach creative, like a creative person technical skills but it is difficult to teach a technical guy creative skills, I think that what they are trying to say, so the guy who is really good with working the program and doing the rendering stuff to make him somebody to be a creative person cause they got crazy idea and making very nice animation is difficult but if there is a guy who is really creative to teach him quickly how to use a program to do, to execute the idea, that's easier, what it comes down to is creative person is almost, he is talented in that way is not as if he is kind of things come easy for him to be creative whereas...you can't really teach it, is like skill or talent*

**2.3 Table 3 (see page 7) respondents to the question: In your opinion and from your experience, should teaching institutions of computer animation focus more on technical or creative skills- indicated that 56% of the highest level of preference (5) thought that institutions teaching computer animation should focus more on creative skills, whereas 31% thought that the focus should be more on technical skills. Any comment on these results?**

- What is your response to the following comment from the questionnaire? *In my opinion, the biggest problem is that the schools are too focussed on software literacy, and don't focus on either of these things. Artistic skills are about learning principles, technical skills are about solving problems. Both of these need to be urgently addressed.*

*I think is right...I think like the biggest problem with the industry is the teaching of animation is showing the guys level of quality of work worldwide, or inspire them, maybe is an inspiration thing, I think is...technical side of things if you really inspired you will figure that out, I think is a more inspiration thing, if people are inspired enough is a bit off this topic, is like technical creative like if you really want to learn animation, you really like animation, you really inspired like learning the technical side of it will come easy and making a creative idea*



would be something that you want to do, if you like it, if you don't like animation or design or stuff like that, there is no use in going into...for me the different between the two focusing on creative and technical skills cause if you don't know technical side of it, you not going to be able to execute your creative idea, teaching somebody to be creative is also, like how do you teach somebody to be creative, creativity is almost inspiration thing, if people are inspired enough they are creative, they want to be creative, they would be creative, its more motivation thing, more sort of...for me a passion thing if you are passionate about it you are going to do it and then if it comes to actual, you will be creative. You can't really, for me, I don't think you can teach people how to be creative, is like, teaching Einstein to come up with an idea, you can't is something you wanted to do so, he did same kind of a thing.

Probe question: technical skills are about solving problems, what does this mean, can you give an example?

So maybe creative guy's idea he wants to...he has an idea, he want the guy to jump through a wall or almost exploding and then bricks must fall apart or whatever, so he got an idea he want it to look in a certain way he does not know how to do it. Technical guy go and figure out in the program is going to use i.e. Maya. Use a certain plug-inns to break the pieces of the wall apart. He is going to use different plug-inns. He is going to use Maya on a smoke and fire effects, he is going to work out technical details for that, whether the creative guys got the idea or the director got idea, if you call that creative they know what they want, is for technical guys to figure out how to do it.

**What is your response to the following summary of the results of the questionnaire survey?**

**2.4.1 Question: Do you think that the nature of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

Yes, I agree, is more important to be creative because like I said, I think I said earlier on if everybody in a class knows how to work with certain program is fine, everyone can do it but, everybody knows how to technically work the program with the buttons to make a wall to explode, make the character run, but the guy who can creatively come up with the best idea, got a good idea for making it look nice at the end and that can animate in a way that to know what they better than the rest of the class because he did it in a very creative, in a way he did it, he is always going to have an upper hand over the other guy that has same technical skills but does not know how to make something to look nice or animate nicely.

With regard to post-production: exactly cause they, is cool, because on the post side of the things, if you talk about post after film is been made maybe is explosions or maybe could be anything, is adding in, say gun fire at the end of the gun or it is a building breaking apart or turning into a mushroom, whatever it is, could be anything, the idea is probably happened before hand, so the concepts is already being made may be is already been filmed and now you doing post effects on it, if you just doing gun shot and stuff like that you have to know technically how to make it, so maybe you not making it more creativity, but still there is a little bit of creativity but is not much as an animator would be doing.

I would say, is quite true because production house like us, we work. We get a script, script is just a bear bone, an idea of what they want and the lot of ideas could get fleshed out, get figured out here, maybe get a script, which is only a written piece, from the script we do storyboard, we work out the whole sequence, as soon as is boarded, we come up with the look and the feel, we come up with grade (colour grading), the whole treatment is done in a production house and then from the animation, all the visual effects, all the post also done by us...there is a lot of creative side, so creative is very important in production house also.

**2.4.2 Question: Do you think that the size of the company could determine which skill is considered more critical in the selection process for junior computer animation positions?**

*It makes sense, maybe because the small companies had to do everything so I guess to execute an idea you need technical skills and creative skills, maybe that's why? Smaller company...I guess in smaller companies they also have to do everything...that's probably because if you are a smaller company maybe the jobs you are doing are smaller, jobs; they are looking for a person who is more like...to do a basic idea, the jobs varies, maybe smaller, maybe is just like a wine promo...to show the bottle you just need to do basics. We got medium company sizes doing bigger jobs which are more creative. You have to figure out more of new ways of doing things and then if you look really in big companies they get maybe the biggest jobs which are, they need lot of creativity to be able to execute not just doing the basic thing, like the little thing like sporting event or maybe, like a video of somebody else want to show off. Bigger companies are doing crazy ideas which requires lot of creative thinking to actually pull it off, they try new things, try new things that have never done before, which demands not just the technical person that also really creative to stand out of the ground.*

## **2.5 What is your response to the view that students hoping to enter the South African animation industry should strive to become Jack of all trades first and specialise afterwards.**

*It is definitely like that because in America you get studios that are already big, so hundred people working on...you turn to specialise just to do lighting or whatever. South African studios are smaller so animators instead of just having to do one specific thing, specialising you end up having to do everything, you do rigging, you do animation, you do the rendering, you do the compositing, so cause our industry is a bit smaller. The less people, the company and then small responsibility on the animators side to know the spectrum of things, so is definitely true*

### **(g) PARTICIPANT 7: INCPT 3**

(Recorded interviews for this participant the sound decibel is on mute- the cause of the problem is unknown.

#### **Notes**

- *Because the aim is to tell a story.*
- *Performance without dialogue, example silence movies, Charlie Chapman, Wallace and Gromit of the Aardman studio.*
- *No: At Blink Tower all members contribute towards creative inputs. Creativity not limited to only creative team, we are a small team, we don't have such teams, and we overlap duties.*
- *It is good for animators to have such skills, but performance it is the key*
- *Yes I agree with the 2.1.1 quote*
- *Technical side of the industry can be in terms of the use of computers etc.*
- *It also depends on what do you mean by technical skills, the use of computer is one part, a technique can also be technical or even the principles of animation, framing a shot, etc.*
- *That means that you can't teach technical person creative skills*
- *Not to be political or what so ever, no one can become a good animator within three years of college studies, if you look at the most good animators you will realise that they have been practicing animation from their early ages.*
- *Schools should definitely teach artistic skills (animation) rather than computer skills*
- *Analogy: Astronauts-scientific technical people help them to develop machine that could get them to discover more planets, to explore the universe etc. in our context technical guys develop software and hardware that creative people can use to generate or create artworks. (Follow up question, not the other way round). In our context technical teams does not really provide technical solutions for creative problems or ideas as such.*

- *Figure 1, I would expect to get a huge different of percentages on this one, at the moment is at variant, so there no clear cut. Creativity should be higher because animation is creativity.*
- *Like I said in the questionnaire – anyone interested in animation must worship principles of animation.*
- *Most of our animators they worked on a freelance basis before and when they come to us they are already indicating maturity in terms of creative technical skills.*