A WHOLE BRAIN PARADIGM FOR THE TRAINING OF MULTIMEDIA PRACTITIONERS

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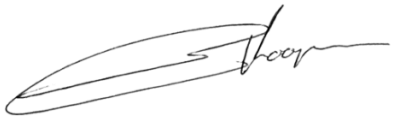

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ABSTRACT

This study explores the notion of whole-brain engagement in the curriculum and instructional approaches for the training of multimedia practitioners.

There is tension within the instruction of Multimedia Technology in that learners appear to prefer working somewhere specific within the range of the technical-aesthetic design continuum. This is important since MMTECH (Multimedia Technology), as an academic discipline, and certainly multimedia practice draws mainly from Aesthetic Design, Audio and Video Technology and the Programming aspect of Information Technology. MMTECH students within the current curriculum dispensation migrate to either being more Design-orientated or more IT/Technology-orientated on the whole; only a relatively small number of students become truly specialist MMTECH graduates that can function in a whole-brained way. Multimedia is a hybrid and adhocratic discipline which incorporates both information technology and aesthetic design aspects. It is this duality of cognitive engagement which characterises the whole-brain engagement in the training of multimedia practitioners.

Multimedia is a discipline in its own right but because it relies on a blending of skillsets that, traditionally, have resided in earlier, more mature disciplines, like Computer Science, Design and the Arts, the interpretation of this by various people, and indeed, institutions offering qualifications in this is, varied. At CPUT, for example, Multimedia as an offering, agglomerates aspects of aesthetic, visual and artistic design with software programming, video and audio technology to be presented via an electronic platform. The projects, too, further emphasise the hybridised nature of the programme in that all major projects are integrated across the four subject offerings.

The aim of this research is, thus, to understand how it is that our learners have this perceived preference. The significance of the study was that this better informs our understanding of what these preferences are so that it better informs an instructional approach to improve whole-brain engagement in the academic programme to inform multimedia practice.

Within the context of the interpretivist paradigm, the methodological approach was subjective and qualitative and the approach that was followed included: Structured and semi-structured Interviews (face-to-face) and formalised literature analysis (documentation - institutional and other documents were used). The data analysis followed a qualitative approach.

The study revealed that Multimedia as a discipline is interpreted and presented with significant variance in focus across the twenty three institutions that were scrutinized.

It also revealed that that within the current programme, there appears to be a more aesthetic/design focus and preference by students but that this could be as a result of the technology aspects of the programme not being adequately supported. This suggests that our

programme offering requires redesigning if we are to present a more holistic approach to the curriculum.

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I am that I am because you are that you are

"There are more things in heaven and earth, Horatio,
Than are dreamt of in your philosophy."
- *Hamlet* (1.5.167-8), Hamlet to Horatio

A journey such as the one undertaken to arrive at this point is not one that is travelled alone.

I would like to express my sincere appreciation to the following people:

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1.1 INTRODUCTION AND CONTEXT

This study explores the notion of whole-brain engagement in the curriculum and instructional approaches for the training of multimedia practitioners.

There is tension within the instruction of Multimedia Technology in that learners appear to prefer working anywhere within the range of the technical-aesthetic design continuum. This is important since MMTECH (Multimedia Technology), as an academic discipline, and certainly, multimedia practice draws mainly from Aesthetic Design, Audio and Video Technology and the Programming aspect of Information Technology. MMTECH students within the current curriculum dispensation migrate to either being more Design-orientated or more IT/Technology-orientated on the whole; only a relatively small number of students become truly specialist MMTECH graduates that can function in a whole-brained way. Multimedia is a hybrid and adhocratic discipline which incorporates both information technology and aesthetic design aspects. It is this duality of cognitive engagement which characterises the whole-brain engagement in the training of multimedia practitioners.

Multimedia is a discipline in its own right but because it relies on a blending of skillsets that, traditionally, have resided in earlier, more mature disciplines, like Computer Science, Design and the Arts, the interpretation of this by various people, and indeed, institutions offering qualifications in this, is varied. At CPUT, for example, Multimedia as an offering, agglomerates aspects of aesthetic, visual and artistic design with software programming, video and audio technology to be presented via an electronic platform. The projects, too, further emphasise the hybridised nature of the programme in that all major projects are integrated across the four subject offerings.

The aim of this research was, thus, to understand if, indeed it is that our learners have this perceived preference and possibly why so that this understanding better informs future instructional approaches to improve whole-brain engagement in the academic programme to inform multimedia practice.

1.2 BACKGROUND TO THE RESEARCH PROBLEM

This section will focus on the key tenets of the research, namely, multimedia training, multimedia in practice and whole-brain training. These are explored below.

1.2.1 MULTIMEDIA TRAINING

The undergraduate Multimedia Technology (MMTECH) programme at Cape Peninsula University of Technology (CPUT) is focused towards developing entry-level professionals to the MMTECH industry in South Africa. The MMTECH program aims to develop both the aesthetic design and technical skills of students.

The Multimedia Technology programme was initially offered as a one-year National Certificate (with the potential for exit after the certificate, if so desired by the learner) and a three-year National Diploma (of which the certificate forms the first year of the three-year diploma programme) Students in the first year are exposed to, and expected to master a range of skills. These subjects carry equal weights and all are pre-requisites for the diploma. (South African Qualifications Authority, n.d.)

On successful completion of the National Certificate, learners proceeded on to the diploma. The subject offerings are: Multimedia Design, Multimedia Technology, Multimedia Practice. (Cape Peninsula University of Technology, n.d.).

Learners are exposed to and expected to become competent in the following vocational-specific areas: Hardware and technology concepts, Media and communication, Programming and Design aspects. These are further expanded in Table 1.1 below.

Table 1.1: Multimedia concepts taught and expected outcomes

Concepts taught	Expected outcomes
Hardware and technology concepts	Understanding, developing and applying fundamental theoretical and practical knowledge as pertains to the technology that supports electronic media.
Media and communication concepts	Understanding and developing the central message for a particular audience
Programming concepts	Understanding and applying the programming concepts required to program, develop and script for the electronic media platform
Design concepts	Understanding applying the principles of the aesthetic, functional and interactive requirements for, and developing the “front-end” for the digital artefact
Critical cross-fields	Inherent within the programme facilitation are the requisite critical cross-field outcomes that we expect learners to have developed throughout the programme

1.2.1.1 MULTIMEDIA IN PRACTICE

MMTECH’s right to exist as a separate discipline is probably best argued on the basis of its practitioners being able to function across the technology/aesthetics divide, which would necessitate being reasonably proficient or possess the necessary aptitudes to function in different

areas. These are predominantly technology-based as well as areas that are predominantly visual design and aesthetically-based. The Multimedia Technology programme is multi- and cross-disciplinary. Learners are required to understand programming and technology concepts as well as understand media and design concepts and how they work together. This suggests that different styles of, and skills in, thinking may be required. These would include skills in idea generation, problem solving and creativity, sequential and logical thinking, analytical and interpersonal. Developing these skills is ultimately aimed at the holistic development of the Multimedia Technologist.

What has been observed since the programme was launched in 2001 is that some students appear to be comfortable working more in the areas of design and aesthetics while others appear to be comfortable largely with technology and programming. Others, in addition, are comfortable working across the continuum of topics. This has been observed, too, when graduates from the CPUT Multimedia programme enter industry as well. Graduates appear to migrate towards either front-end design or backend development (in the case of web design and development). Some appear to specialise only in video production or in the audio production environments while others have been able to operate quite comfortably across the continuum of skillsets required. In smaller companies, or where graduates have started own businesses, they appear to be required to operate in more than one area, while in larger companies, they usually form part of a team made up of purely creative and conceptual developers, code and database developers, content writers and producers or project managers. Evidence for this is noted in the way jobs in the industry are classified and how people are recruited based on the Organising Framework for Occupations (OFO). The OFO is a skill-based classification system, which classifies all occupations in the South African context and lists typical job titles (Media, Information and Communication Technologies Sector Education and Training Authority, n.d.).

1.2.2 WHOLE BRAIN TRAINING

This programme ostensibly supposes that its treatment of the programme exposes and grows students in all areas, and if we understand that, conventionally, people associate certain cognitive functions with areas of the mind, it seems prudent to consider or to interrogate what (or indeed if) the concept of whole brain training exists or is possible.

That there appears to be a preference for a particular learning style or brain dominance is evidenced in the literature. A study conducted to determine the brain dominance of pre-service mathematics teachers found that there were significant indicators that certain parts of their brains were dominant (Özgen, 2011:743-750) The authors performed the study on 273 pre-service

mathematics teachers using “Brain Dominance Analysis and “Learning Style Inventory” as data collection tools. They found that these teachers appear to prefer the “converger” and “assimilator” learning styles.

Another study explored the effect of brain dominance on students’ academic performance and learning English and how knowing the brain dominant profile of the student is important and how to employ appropriate teaching approaches to support their dominant profile (Oflaz, 2011:1507-1513).

To improve the Multimedia offering, it appears that we need to explore how we train students and how we optimise the offering either by exploring our selection approaches for the course or by exploring whether the curriculum can be designed to grow students holistically and possibly consider how to cater for their preferences in how they prefer to engage with the different types of content. In order to do this, we need to understand at least some of what neuroscience has uncovered thus far about how we think, learn, and what type of content we prefer to engage with.

Learning, behaviour, the senses, emotions, memory, personality and many other human traits all have one common denominator: The brain. It appears that in order to continue to improve the learning experience, it would be sensible for trainers and educators to carefully consider studies and advances in the understanding of the functioning of the brain and its application in education. The evidence would need to be “carefully” considered since misconceptions about the evidence or existence of neuromyths that are loosely based scientific evidence would negatively impact on education (Broca, cited in Hugdahl 2000:212).

Without delving too deep into Neuroscience, which is not the focus of the study, it helps to sketch a brief history of explorations into how brain and mind function as this informs theories around learning and, specifically, how to optimise learning. This is the focus of this study after all.

Specifically, as pertains to this study, the study of brain laterality and hemispherical functional segregation has a long history. Broca (1861, cited in Hugdahl 2000:212) mid-1800’s studies and suggestion of locality of the language centres of the brain and Wernicke’s (1874, cited in Hugdahl 2000:212) studies on language deficits indicated that various aspects of human functionality could be localised in an area or areas of the brain. The often-cited split-brain experiments by Sperry (1961:57) and Gazzaniga (2000: 1293-1326) involved investigations into various cognitive and perceptual processes as located in and contributed by, each hemisphere. The left hemisphere is associated with speech and appears to be dominant in activities involving language, arithmetic, logic and analytical processing while the right hemisphere is associated with spatial recognition

and comprehension, facial and form recognition, sense perception, emotions and aesthetic and artistic appreciation.

Other theories like that by Paul Maclean who proposed the evolutionary model of the triune brain; suggesting that the brain is composed of three parts: The reptilian brain (or primitive brain), the intermediate brain (limbic system) and the neocortex (rational brain) (Pearce, 2008).

While evidence exists that certain functions are predominantly located in a hemisphere, and indeed some have suggested that hemisphericity might be instrumental in indicating differences between individuals, others (SeokHoon & Yep, 2000) have explored the possible link between learning styles and hemispheric preference and hemispheric preference and academic achievement (Yeap, 1989:225). Suggestions are that hemisphericity and learning styles are linked and that academic achievement is linked to cerebral dominance (Gadzella, 1995:153). This is of interest to us as educators. If there is a link between how students learn (learning style) and a thinking preference, then it would be instructive to consider this in possibly how we train potential practitioners and therefore how we select learners for training programmes, set the pre-requisites for the course or how we facilitate the learning experience.

The work done by MacLean and Sperry sparked further investigations into models that describe the functional areas of the brain such as the Herrmann Whole Brain Model. Herrmann suggested that the hemispheres could be further subdivided into quadrants; each of which dealing with different thinking processes (Hermann, 1995:411). Subsequent studies even suggested a relationship between handedness (left or right) and a contralateral hemispheric dominance (Knecht et al., 2000:2512-2518). Brain dominance or hemisphericity is considered to be the inclination to employ mostly either left or right or both sides of the brain in processing information.

These earlier studies generally suggested a locality of physiological functionality but also spawned terms like “left-brain dominant” and “right-brain dominant” and even views that thinking profiles and cognitive styles were associated with how “dominant” the one hemisphere is over the other. These grew out of the interpretation of the findings.

In 1999, at the University of Pretoria, educators were involved in a study to explore their thinking preferences and styles. This assisted in growing the awareness of a whole-brain concept and also highlighted the diversity in thinking styles and preferences (Du Toit et al., 2001:185-193). Another study involved pre-service mathematics teachers where their researchers aimed to determine the brain dominance and learning style profiles of pre-service mathematics teachers to establish the relationships between them. This study, too, showed diversity in thinking styles and patterns (Özgen et al., 2003:743-750).

Exploring and considering these models, and their implications for education, then, could very well have value for the Multimedia programme because by understanding how we think and which areas of the brain we may prefer to operate from, it might inform a better understanding of why learners appear to have a preference for some aspects of their academic engagement over others. It might also assist educators in exploring holistic ways of engagement if the aim is to graduate students with at least some competence in all areas of the discipline called Multimedia.

1.3 STATEMENT OF THE RESEARCH PROBLEM

There is a lack of understanding within the training programme of Multimedia Technology students as to how learners appear to prefer working anywhere within the range of the technical-aesthetic design continuum. This is important since MMTECH, as an academic discipline, and certainly, multimedia practice draws mainly from Aesthetic Design, Audio and Video Technology and the Programming aspect of Information Technology. MMTECH students within the current curriculum dispensation migrate to either being more Design-orientated or more IT/Technology-orientated; only a relatively small number of students become truly specialist MMTECH graduates that can function in a whole brained way.

1.4 RESEARCH AIM

The aim of this study is to understand why there is a perceived bias by students enrolled for the Multimedia Technology Programme towards either 'Design' or 'Technology' or in some cases why some learners appear to work equally well in both spaces. This understanding could potentially inform future curriculum and instructional approaches and move towards improving whole-brain engagement in academic engagement and therefore to inform multimedia practice.

Research Question

Why does there appear to be a perceived bias by students for some subjects over others in the Multimedia Technology programme?

Research sub-questions

1. How does Multimedia discipline present globally?
2. How do learners engage within the range of required skills within Multimedia training?
3. Why is it that there appear to be academic engagement preferences within the multimedia programme at CPUT?
4. How do staff and industry perceive students' capability to perform across the multimedia technical-aesthetic design continuum?

Table 1.2: Research questions, methods and objectives

Research Sub-Questions	Method(s)	Objectives
1. How does Multimedia discipline present globally?	Formalised literature analysis.	Establish the current nature of the Multimedia discipline so as to determine the parameters to be explored and reach a consensus in understanding what is required for the development of Multimedia professionals
2. How do learners engage in the range of required skills within Multimedia training?	Interviews	Determine the range of skills and type of engagement requirement for the development of Multimedia professionals
3. Why is it that there appear to be academic engagement preferences within the multimedia programme at CPUT?	Interviews	Determine the preferences of learners within the Multimedia Programme at CPUT
4. How does industry perceive students' capability to perform across the multimedia technical-aesthetic design continuum?	Interviews	Determine the perceptions of industry of our learners' abilities and preferences.

1.5 CURRENT STATUS OF THE RESEARCH AREA

1.5.1 MULTIMEDIA: UNDERSTANDING THE TERM

1.5.2 MULTIMEDIA AS A DISCIPLINE

Defining multimedia as a discipline is not as straightforward. Well-defined and mature academic disciplines have, over time, been filtered and refined to become what they are. There is no doubt in most people's minds what a Bachelor of Science in Chemistry means or, for that matter, a PhD in Astrophysics. If you were to mention that you are reading for a degree in Multimedia, it would conjure up different perceptions in various people's minds. The definition of multimedia itself is

perceived is in various ways by different people and it also appears to be contextual. Often, the term is used as a marketing term to promote a product. Advertising a computer with the addition of: 'Multimedia Enabled' adds more to the allure but simply means that the computer is capable of producing sound and video. The understanding of what multimedia really is thus appears to be contextual. Designing curricula for multimedia becomes a challenge as the question of whether multimedia is a discipline on its own and where the ownership lies arises.

In the late 90s and the early part of the 21st century, many arguments were made to support that multimedia be considered a discipline on its own (University of Virginia, 1999) and in Forum Computerphilologie (2002), arguments were made against considering multimedia as a mere extension of existing content into the digital domain or that merely placing existing courses together under a qualification called multimedia (Gonzalez, 2000:72-78) and (Gonzalez et al., 2000:72-78).

Multimedia has evolved since the 90s and is established as a discipline, though it is unique in that it may reside in Humanities discipline, the Formal Sciences discipline or the Applied Sciences discipline as can be seen in Appendix II.

1.5.3 MULTIMEDIA OFFERINGS AT VARIOUS INSTITUTIONS

Multimedia-type offerings at eleven institutions in South Africa and twelve abroad were investigated to determine: Which faculty or school they are located in, what the qualification is called, the duration of the offering, possible career options, entrance requirements, the generic outcomes of the course and the subject offerings for each year. These are tabulated in Appendix I. What is evident is that each institution has an interpretation of what Multimedia is and has thus created offerings based on their interpretations of what the discipline is. They have also located their Multimedia offerings in various schools, faculties and departments and have also have various names for these course offerings and, on closer examination of the generic outcomes and course/subject modules, have a particular bias. It is challenging to exactly quantify the trend in where the programmes are located due to the diverse nature of the naming conventions used by the various institutions. A larger sample would be required to more clearly understand whether there is a generic bias in terms of the perception of what Multimedia is and where to locate the discipline.

It appears, from the data in Appendix I that an institution's offering could be offered with a strong technology, engineering or computer science bias or it could be offered with a strong visual arts bias or it could be anywhere in between. Indeed, some institutions offer a number of variations of Multimedia course offerings in an attempt to cover a range of specialities.

What the preceding findings appear to suggest is that while Multimedia has become accepted as an offering most institutions would consider, there appears to be a continuum along which the offering would be presented. This would range from highly technical in nature to highly aesthetic and visual arts-based.

Multimedia appears to rely on proficiencies in different areas and it further appears that where an offering is placed depends on which set of proficiencies are grouped together in the offering.

1.5.4 CPUT AND GLOBAL SELECTION AND ADMISSION STRATEGIES

From Appendix I we notice that admission and selection into a programme are informed by which faculty or department the programme resides in. It appears that if a programme is located largely in the visual arts area, then candidates are selected based on standard university entrance requirements in addition to first language scores and submission of a creative portfolio. If the programme has a strong technology focus, the emphasis is generally on Mathematics and first language scores.

At CPUT, candidates for the Multimedia programme are selected based on their Grade 12 scores and a minimum points system.

1.5.5 THE MULTIMEDIA TECHNOLOGY PROGRAMME AT CPUT

The Multimedia Technology programme is multi- and cross-disciplinary. Learners are required to understand programming and technology concepts as well as understand media and design concepts and how they work together. This suggests that different styles of, and skills in, thinking and cognitive processes may be required. These would include skills in idea generation, problem solving and creativity, sequential and logical thinking, analytical and interpersonal communication. Developing these skills is ultimately aimed at the holistic development of the Multimedia Technologist.

MMTECH, as an academic discipline, draws mainly from Design, Video Technology, Audio Technology and the Software Development aspect of Information Technology but is also strongly underpinned by Communication Science. The MMTECH programme, as a multidisciplinary or hybrid offering at CPUT, has always been challenged with finding the right curriculum balances. Furthermore, it has always been difficult to select students onto the MMTECH programme because students, by popular consensus, more often than not appear to have either a preference for aesthetics and design (being concerned with how things look) or the technical functionality (how things work). The issue of preference, perhaps being informed by a brain hemispherical bias, often comes to the fore when dealing with “whole brain” activity, such as, a capstone website

development project where a student is required to demonstrate competency in both the frontend and backend development while including other multimedia elements that are more design and aesthetically-based. MMTECH's right to exist as a separate discipline is probably best argued on the basis of its practitioners being able to function across the technology/aesthetics divide, which would necessitate whole brain cognition.

Since this course clearly requires an ability to function to some degree across hemispheres, how do we design our curriculum to enable this? The question that needs to be answered is: How do we best train our students to function holistically given that they access the course with certain baseline attributes.

This research aims to explore the training aspect of Multimedia students but an understanding of the above will better inform our training approaches.

1.6 RESEARCH DESIGN AND METHODOLOGY

1.6.1 RESEARCH APPROACH

The research involves an interpretive approach whereby an attempt to observe and understand the qualitative data collected is central to the study. The research process logic diagram is depicted in graphical form in Chapter 3.

1.6.2 RESEARCH METHODOLOGY

Within the context of the interpretivist paradigm, the methodological approach is subjective and qualitative and the approach followed included: Semi-structured Interviews (face-to-face), formalised literature analysis (documentation - institutional and other documents was used). The research design assumes a phenomenological stance since we seek to study the individual's lived experiences. (Bhattacherjee, 2012:106.)

The data analysis is qualitative since: "Qualitative researchers are interested in understanding the meaning people have constructed, that is, how people make sense of their world and the experiences they have in the world." (Merriam, 2009:13)

1.6.3 RESEARCH APPROACH AND IMPLICATIONS FOR DATA COLLECTION

Since the aim was to seek meaningful and symbolic content in the qualitative data, an inductive approach was employed, clustering and identifying relationships and recurrent themes. Questions

were initially open-ended but becoming more precise as information/patterns/themes emerge – adopting a circular, iterative and progressive approach. The research process logic diagram in Chapter 3 attempts to best describe the process followed.

Since the aim was to use questions to arrive at an understanding of our students' individual experiences this research approach could be described as phenomenological

The approach that was employed involved the following:

Table 1.3: Area of exploration, methods, research participants and expected outcomes

Area of Exploration	Method	Potential participants or sources	Outcome
Understanding student experience	Face-to-face interviews	7 x Senior Students chosen from level 3 and BTech Students	Student perceptions of the Multimedia programme
Understanding industry requirements and perceptions	Face-to-face interviews	3 x Industry professionals	Industry perceptions of the Multimedia programme
Understanding academic experience	Face-to-face interviews	3 x Staff members	Staff perceptions of the Multimedia programme
Curriculum documents	Sourcing and analysing documents	Institutional archives	How the Multimedia course is taught

1.7 UNIT OF ANALYSIS

Table 1.4: Units of analysis and units of observation. Adapted from Mlitwa (2011:104)

	Group	Individual Actor	Activity
Unit of Investigation	Research Population: Higher Education Institutions and Industry	Research Population: Learners, Educators, Industry Practitioners	Research Population: Teaching & Learning Practices
Unit of Analysis	Universities Offering Multimedia and Industries Engaged In Multimedia Practice	South African and International Learners, Educators, Industry Practitioners	Student and Practitioner Activity Preference
Unit of Observation	Specific Departments within Universities and Industry Involved With Multimedia	Sample South African and International Learners, Educators Within Departments Offering Multimedia and Industry Practitioners Engaged in Multimedia Practice	Factors Affecting Student and Practitioner Activity Preference

1.8 DELINEATION OF THE RESEARCH

This study will be limited to learners within the Multimedia Programme at CPUT, Staff within the Multimedia Programme and industry practitioners working in multimedia practices.

1.9 CONTRIBUTION OF THE RESEARCH

The aim of this research was to explore how it is that our learners have a perceived preference for ‘Right- or Left- or Whole-Brained” engagement and to investigate a whole-brain paradigm for the training of multimedia practitioners. The aim was to arrive at declarative statements which purport to describe the nature of a holistic whole-brain instruction approach such that it may inform future curriculum development efforts and praxis.

1.10 STRUCTURE OF THE THESIS

This chapter attempted to provide the context, rationale, statement of the research problem and methodological approaches that were followed

The literature review and the contextual framework for the study are presented in Chapter Two.

Chapter Three explores the methodological approaches employed. This chapter describes the research paradigm, methodology, research approach and the implications for data collection. The data collection methods are also covered in this chapter. Reliability, validity and bias are addressed as well as delineation of the research and ethical considerations.

Chapter Four covers the presentation and analysis of the data gathered. The data sets are reduced to themes and the chapter also explores the findings in relation to the literature analysis.

In Chapter Five, the findings are summarised and conclusions are drawn. Recommendations are made based on findings and with reference to the aims of the study. Potential areas of consideration for further study are also covered.

CHAPTER 2: LITERATURE REVIEW AND CONTEXTUAL FRAMEWORK

2.1 INTRODUCTION

Chapter 1 attempted to offer justification and motivation for the study. In it, the tension that exists within Multimedia in its current dispensation was discussed as relates to there being a perceived bias or preference by students to either concentrate on the more design-related aspects of the course or on the more technical and coding aspects of the course.

It was proposed that in order to improve our training of Multimedia professionals, perhaps it would be necessary to attempt to understand why there is this perceived preference or bias with a hope that it informs how we train Multimedia practitioners so that they are well (or, at least, reasonably) prepared for entry into industry.

Since there appears to be this perceived bias or preference for subjects in a course that exposes students to a range of topics that extend from aesthetic design to technical aspects like coding, we need, it appears, an approach that is holistic in treatment so that all the required skillsets are considered.

The programme represents an academic offering within a range of diverse offerings at the University. The University supports six faculties: Business, Health Sciences, Engineering, Education, Informatics and Design. Multimedia Technology falls within the Faculty of Informatics and Design and is a programme offered within the Department of Information Technology. The Department of Information Technology offers Communication Networks, Software Development, and Multimedia Technology as streamed curricular such that students, on registering with the department, choose a stream from the onset, as with Multimedia Technology, or from the second year, for Software Development and Communication Networks (CPUT, n.d.).

In Chapter 1 we mention that Multimedia, in its current form at CPUT, is a hybrid discipline and that it borrows from principles conventionally associated with aesthetic design and from skills traditionally taught in an Information Technology programme. Students are also exposed to other aspects that merge technology and design such as video and audio production as well as photography.

This suggests, therefore, that in order to optimise the programme to expose learners to the best holistic learning environment, it would seem that we need to interrogate:

Multimedia as a term and discipline

The current programme and subjects at CPUT

Learners' preferences and biases towards certain subjects or the spaces they're most comfortable with working in

Multimedia education nationally and internationally to try and understand how it is understood, curriculated and taught

What the body of knowledge says about how students learn

Whether there is a preferred way in which students learn and think

If we can reach some level of understanding of the above, then perhaps it will inform how we best engage our learners in attempting to produce the most holistically trained learners.

If we wish to consider how best to engage our learners in the most holistic, whole-brained, way, then we need to understand and consider advances in understanding how the brain works. Note that this research is not about neuroscience but it is merely an attempt to consider the impact that advances in our understanding of how the brain works have impacted on how we engage learners. This research, while exploring notions of learning styles theory and models and also the impact of exogenous and endogenous impacts on learning, is limited to attempting to understand learner preferences with a view of informing instructional approaches within the Multimedia Technology programme.

This chapter begins by exploring the term "Multimedia" in greater depth; the purpose of which is so that we may understand its interpretation by CPUT and other institutions. The range of in- and out-of-classroom factors that potentially affect learning are also briefly discussed.

Since it is the intention to arrive at potential declarative statements that relate to the improvement of how best to engage learners in Multimedia at CPUT, the study includes the potential skills that Multimedia practitioners are required to be exposed to and those that need to be developed in order to improve the academic offering.

In attempting to understand how learners engage in an environment that requires functioning in both the aesthetic/design as well as the technical/coding space, some understanding of the functioning of the brain as relates to historical and current knowledge about which regions of the brain deal with various cognitive functions are briefly explored to provide a baseline for exploring the impacts of advances in the understanding of these on education.

Theories about learning and how students learn have been debated in the literature for a great deal of time. Though it is not the focus of this study, some of the more popular theories, models and instruments are presented as evidence that this challenge is not new and also to provide a basis for reference for the rest of the study.

Whole-brain learning is explored in greater depth in the latter part of the chapter; the intention of which is to understand whether this has bearing on the intent of this study which is to try and understand if and why preferences exist and if they do, what impact this has on future engagement in the programme.

This, then, represents the contextual background against which this study was conducted.

2.2 REVISITING THE TERM

In Chapter 1 we explored what the perceptions of what Multimedia means and how it is understood by various people and industries was covered. In this section the term itself is explored in greater detail to understand how the term came into existence. This section explores how the term evolved.

Multimedia was first used by Bob Goldstein in 1966 in promoting his show, “LightWorks at L`Oursin” which combined the visual effects of light, sound and other elements for his show. (Soman, 2015:1-4). “Intermedia” was introduced a few years later by Dick Higgins to describe the notion of an all-encompassing term to describe the overlapping and, in some cases, merging of different representations of media, performance, art, events, text and other elements. (Higgins, 2001:49-54). Multimedia was understood to be any presentation in a form involving more than one media element. So, even a magazine could strictly be considered to be multimedia because it contains both text and images but eventually, the term was used to represent many different forms of presentation until Tay Vaughan proposed the following definition in 1993: “Multimedia is any combination of text, graphic art, sound, animation, and video that is delivered by computer.” (Vaughan, 1993:3).

Multimedia can be presented such that a user perceives the elements in a passive way, such as when viewing a presentation involving video and audio elements. A presentation may also be designed such that a user may interact with it, such as in engaging in an online game. This is referred to as Interactive Multimedia (Florence & Povey, 2014:5). Hypermedia, on the other hand, extends the user’s experience in that the user is able to navigate from one point in the presentation to another by interacting with a structured linked system of elements (Vaughan, 2014).

The term has convolved to become the current understanding of the term as defined as: “Multimedia is any combination of text, art, sound, animation, and video delivered to you by computer or other electronic or digitally manipulated means. It is richly presented sensation. When you weave together the sensual elements of multimedia—dazzling pictures and animations, engaging sounds, compelling video clips, and raw textual information—you can electrify the thought and action centres of people's minds. When you give them interactive control of the process, they can be enchanted.” (Vaughan, 2014).

With the advancement of technology, new means of representing data have evolved. Video, sound, graphics, motion graphics, animation and text creating, capturing, editing and presentation platforms rapidly evolved such that new means of representing media and content are now easily accessible. This makes for a rich media experience between the producer and the audience. The initial sensorial interaction has been auditory and visual. More recent advances in technology have included touch and even taste. These go beyond virtual reality and augmented reality to include gyroscopes, accelerometers, pressure sensors, and motion sensors. Multimedia has also been employed in remote sensing and monitoring of medical patients through smart, wearable body sensors. (Xsens, 2015), (Heinz et al., 2006:98-102), (Antifakos & Schiele, 2002:139-140) and (Appelboom et al., 2014).

2.3 FACTORS AFFECTING LEARNING

“[T]he learner brings an accumulation of assumptions, motives, intentions, and previous knowledge that envelopes every teaching/learning situation and determines the course and quality of learning that may take place” (Biggs, 1996:348, cited in Steenkamp et al., 2009:113).

Along with learning styles, learning preferences and personality types as discussed briefly in the previous section, there is a range of varying factors that have been explored as having the potential to impact on the learning experience of students.

It is not the intention of this study to explore these in any great depth here but they are presented here since it is acknowledged that various studies have been undertaken to understand potential factors that affect student learning in order to ultimately inform pedagogy.

While in- and out-of-classroom factors, as briefly discussed below, and explored by many researchers, appear to be significant in their effects on student academic performance, these, while introduced here, are not covered extensively in this study.

Central to the focus of tertiary institutions is the success of its learners. The measurement of students' performance has received much attention recently (Mushtaq & Khan, 2012). They also suggest that the performance of students is affected by social, psychological, economic, environmental and personal factors but these vary on an individual basis and also appear to vary according to location. Their study was limited to exploring the effects of students' abilities to communicate effectively, the facilities available to learners, suitable guidance and family stress. These were all found to play a role in how students perform.

Various exogenous and endogenous factors appear to affect student success. Steenkamp et al. (2009:113-140) found that poor class attendance, inadequate preparation, poor time management, proficiency in the language of instruction and whether students had prior exposure to the subject were statistically significant factors that affected the population under study.

Swanepoel et al. (2011:171-188) found in their particular study of distance learning students, that it was the status of employment, the language of instruction, where they lived, technology accessibility and prior and current academic performance which proved to be statistically relevant

In a different study, Rovai et al. (2005:359-370) explore the influences of cultural differences on student performance. They explore the under-performance of African-American students at predominantly White universities. They identified a few factors which contribute to the minority achievement gap. Factors which were identified include: "…the transmission of knowledge by schools in cultural codes, mismatches between teaching styles and the African American learning style preference, weak institutional support for minority students, a fragile racial climate on predominantly White campuses, racial stereotyping, peer influences, low expectations, and weak study habits."

Khanna et al. (2018), in their study, distributed 1000 psychometric evaluations to 14 institutions of higher education to both undergraduate and postgraduate students in an attempt to evaluate the psychological factors affecting students' performance. They employed various instruments to evaluate: Achievement motivation, study habits, extraversion, conscientiousness, social anxiety, emotional competence, and self-efficiency. They conclude that the aforementioned psychological factors do impact on student performance. They also conclude that there are multiple factors to be considered in student performance and they suggest that the most important factors have yet to be identified.

Other studies explored other variables and found relevance in the data relating to factors such as motivation, gender, age, location within a particular faculty, socio-economic status of the parents, housing and number of hours spent studying (Kusurkar et al., 2013; Ali et al., 2013).

2.4 COMPETENCIES AND SKILLS REQUIRED BY MULTIMEDIA PRACTITIONERS

MMTECH, as an academic discipline, draws mainly from Design, Video Technology, Audio Technology and the Software Development aspect of Information Technology but is also strongly underpinned by Communication Science. The MMTECH programme, as a multidisciplinary or hybrid offering at CPUT, has always been challenged with finding the right curriculum balances. Furthermore, it has always been difficult to select students into the MMTECH programme because students, by popular consensus, more often than not appear to have either a preference for aesthetics and design (being concerned with how things look) or the technical functionality (how things work). The issue of preference, often comes to the fore when dealing with "whole brain" activity, such as, a capstone website development project where a student is required to demonstrate competency in both the frontend and backend development while including other multimedia elements that are more design and aesthetically-based. MMTECH's right to exist as a separate discipline is probably best argued on the basis of its practitioners being able to function across the technology/aesthetics divide, which would necessitate whole brain engagement.

Since this course supposedly requires an ability to function to some degree across hemispheres, how do we design our curriculum to enable this?

Perhaps the initial question that needs to be answered is: Do we have to select or only allow potential learners with particular attributes onto the course?

In order to answer this, perhaps the following needs to be answered:

- If there is a functional asymmetry to the functioning of the brain, does this imply a cognitive asymmetry
- What are the implications of this research for a hybrid programme like Multimedia Technology?
- Does hemispherical dominance exist and should the programme be designed to cater for this?
- Do our students gravitate towards certain subjects because of a dominant thinking profile?
- What is the impact of thinking profile on learning?

In this study, we do not explore the selection but rather the training of Multimedia Practitioners once they have entered the programme

2.4.1 CONCEPTIONS OF LEFT- AND RIGHT- BRAIN DOMINANCE AND WHOLE-BRAIN ACTIVITY

Learning, behaviour, the senses, emotions, memory, personality and many other human traits all have one common denominator: The brain. It appears that in order to continue to improve the learning experience, it would be prudent for trainers and educators to carefully consider studies and advances in the understanding of the functioning of the brain and neuroscience and its application in education. The evidence would need to be "carefully" considered since misconceptions about the evidence or existence of neuromyths that are loosely based scientific evidence would negatively impact on education (Broca, cited in Hugdahl 2000:212). Note that the focus of this study is not to explore neuroscience in any great depth. An attempt is being made to merely understand what advances have been made in understanding how our cognitive abilities function so that we may better inform pedagogy.

The history of studies into the brain and suggestions about the existence about dominance is discussed as a bases for providing context for the evolution of the some ot the learning theories and models which subsequently evolved out of this earlier work.

Specifically, as pertains to this study, the study of brain laterality and hemispherical functional segregation has a long history. Broca (1861, cited in Hugdahl 2000:212) mid-1800's studies and suggestion of locality of the language centres of the brain and Wernicke's (1874, cited in Hugdahl 2000:212) studies on language deficits indicated that various aspects of human functionality could be localised in an area or areas of the brain. The often-cited split-brain experiments by Sperry (1961:57) and Gazzaniga (2000: 1293-1326) involved investigations into various cognitive and perceptual processes as located in, and contributed by, each hemisphere. The left hemisphere is associated with speech and appears to be dominant in activities involving language, arithmetic, logic, and analytical processing while the right hemisphere is associated with spatial recognition and comprehension, facial and form recognition, sense perception, emotions, and aesthetic and artistic appreciation. Sperry's depiction of the location of these functional areas can be depicted graphically in Figure 2.1.

Left brain		Right brain
Reason		Emotions
Logic		Intuition
Objective		Subjective
Language		Creativity
Detail		Holistic perception

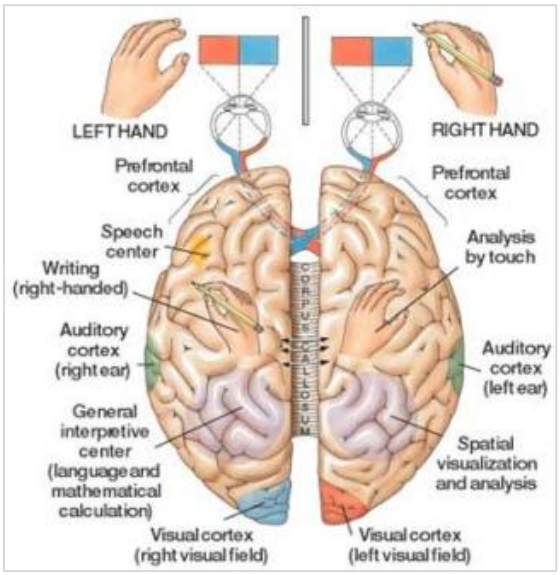


Figure 2.1: Brain hemispherical lateralisation (Source: http://www.rightleftrightwrong.com/images/brain.jpg**)**

Subsequent studies even suggested a relationship between handedness (left or right) and a contralateral hemispheric dominance (Knecht et al., 2000:2512-2518).

Paul Maclean proposed the evolutionary model of the triune brain; suggesting that the brain is composed of three parts: The reptilian brain (or primitive brain), the intermediate brain (limbic system) and the neocortex (rational brain) (Pearce, 2008) (see Figure 2)

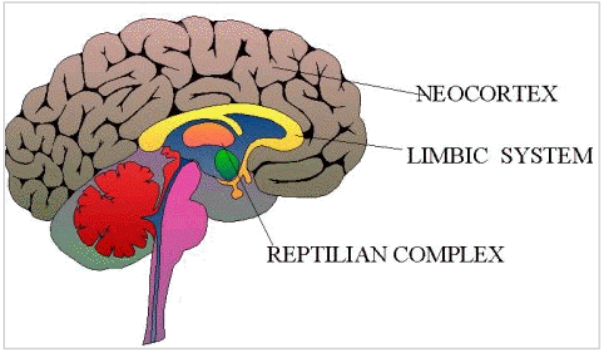


Figure 2.2: The triune brain (Source: http://www.rightleftrightwrong.com/images/brain.jpg**)**

The functions associated with these areas are shown in Table 2.1

Table 2.1: Functions associated with the triune brain sections

Section	Functions
Reptilian	Always alert, controls basal functions for survival like breathing, circulation, blood pressure, pain response, Instinctual responses, aggression, dominance, territory defence, self-preservation and ritual
Limbic	Motivation, emotions, reproductive behaviour, and parenting, bonding, memory function, smell,
Neocortex	Intellectual, rational, academic learning and cognitive processes, logical and formal operations, abstract thought

These earlier studies generally suggested a locality of physiological functionality but also spawned terms like “left-brain dominant” and “right-brain dominant” and even views that thinking profiles and cognitive styles were associated with how “dominant” the one hemisphere is over the other. These grew out of the interpretation of the findings.

Brain dominance or hemisphericity is considered to be the inclination to employ mostly either left or right or both sides of the brain in processing information.

2.4.2 MIND OVER (GREY) MATTER

A question arises out of the exploration of the literature: If there is an indication of some functional asymmetry to the functioning of the brain, does this imply a cognitive asymmetry as well? Also, what are the implications for learning, educating and selection strategies?

While evidence exists that certain functions are predominantly located in a hemisphere, and indeed some have suggested that hemisphericity might be instrumental in indicating differences between individuals, others (SeokHoon & Yep, 2000) have explored the possible link between learning styles and hemispheric preference and hemispheric preference and academic achievement (Yeap, 1989:225). Suggestions are that hemisphericity and learning styles are

linked and that academic achievement is linked to cerebral dominance (Gadzella, 1995:153). This is of interest to us as educators. If there is a link between how students learn and a thinking preference, then it would be instructive to consider this in possibly how we train potential practitioners and therefore how we select learners for training programmes, set the pre-requisites for the course or how we facilitate the learning experience.

Kim and Michael (1995:60) suggested that there is a link between the learners' cognitive style and academic achievement. Zhang (2002:331-348) found that thinking preferences (liberal, global, conservative) and modes of thinking are similar to some degree and he, too suggested that they contribute to academic achievement.

2.4.2.1 Brain plasticity

The research, as described in the previous paragraphs, covers studies done on the functioning of the brain and possible hemisphericity and also that thinking preferences and modes of thinking appear to be linked to academic achievement. This suggests that understanding more about how the brain functions could have clues for how we engage students. A few questions arise out of this. Essentially:

> Can new approaches or different approaches effect change in learners' abilities to process information?
>
> Are there ways to improve this?
>
> Can we retrain our brains and thinking ability is it fixed for life?

For a time, it was widely accepted that our neural makeup and brain functioning was determined at birth and remained that way throughout adulthood. (Slate, 2007).

However, later studies suggest that the brain can be trained to introduce new neural pathways and also improve in areas that people were thought to not have an aptitude for.

Neuroplasticity, an area of neuroscience, suggests that by employing certain training approaches, new skills can be learned, memory improved, creative thought improved and analytical and creative thought processes improved. Paul Bach-y-Rita was able to create a device that allowed congenitally blind people, with training and over time, to detect shadows, the outlines of words and depth perception by using a by placing and electrically stimulated sensor on the tongue and connected to a camera. (Bach-y-Rita et al., 1998:427) Sheperd Ivory Franz was able to show that stroke victims that were previously paralysed could recover (in some cases completely) by using exercises to stimulate the brain (Colotla & Bach-Y-Rita, 2002:141). Michael Merzenich, a

neuroscientist with decades of research into neuroplasticity suggests that neuroplasticity exists throughout our lives and by employing certain exercises, can improve cognitive abilities and also our learning and thinking and memory. He also developed the FastForWord brain exercises that assist with learning and language difficulties (Marshall, 2004:136). Norman Doidge further explored how stroke victims are able to recover to normal levels due to neuroplasticity (Doidge, 2007:45).

If the advances in studies in neuroplasticity suggest that that brain, and therefore cognitive, thinking and other abilities can be re-trained, recovered and even trained, could we also train thinking abilities? Edward de Bono, the originator of the term 'lateral thinking' and author of many books and articles around thinking and how thinking and creativity can be taught suggests that through exercise, thinking and creativity can be improved (De Bono, 1969). So, if the brain is able to constantly adapt and change, depending on the stimuli provided, and if thinking and creativity can be trained, is it possible that learners with a preference for design-type work can be trained to be better at technology-type efforts and vice versa? Could a person, typically exposed primarily to programming and technology-type content be taught to draw skilfully? Dr Betty Edwards pioneered an intensive five-day course in drawing where any individual is taken from no, or very little, skill in drawing to a point where sketches rendered by the participants show remarkable improvement over the five-day period. She authored "The new drawing on the right side of the brain" (Edwards & Edwards, 2012)

New terms like 'brain-based learning' have evolved out of the recognition of the connection to the advances made and understanding of how the brain functions in neuroscience and education. Bonomo (2017:27) suggests that: "Brain-based learning is a comprehensive approach to instruction using current research from neuroscience." She further says that: "In recent years, educators have explored links between classroom teaching and emerging theories about how people learn. Brain research provides us with many possibilities for education, and there is much discussion among educational professionals about how this research should be considered when developing programs and curriculum." Brain-based learning aims to accommodate individual characteristics and styles, keeping the brain in mind (Jensen, 2005).

Jensen (2008) suggests that evidence exists to support that "brain-based" models are significant as an educational concept in our current century.

2.5 LEARNING STYLES, PERSONALITY TYPES AND LEARNING PREFERENCES

No study about students' learning would be complete without recognising that educators have been grappling with how students learn for a long time.

This section touches on some of the research that has been performed in an effort to improve pedagogy without exploring each of the theories in any great depth.

There are differences in viewpoints and opinions by various authors in the literature is as discussed further in this section and these are acknowledged and presented here to provide a basis and contextual reference for the study. It is acknowledged, too, that while some authors argue that learning-styles models are not a predictor of performance, this study is concerned with preferences and the choices students make and not with the prediction of success.

It should be noted here that while a detailed exploration of each of the models and constructs available would be too exhaustive for this study and would best be done as a separate study, reference is made to some of these, as mentioned, to provide a basis for providing a contextual framework for the study.

Out of the interrogation into student learning and retention have emanated many models, constructs, instruments, and measures. It appears that how students learn is still not clearly understood if one explores the many theories and models in existence today. To name only a few, these include: Allinson and Hayes' Cognitive Styles Index (CSI), Apter's Motivational Style Profile (MSP), Dunn and Dunn model and instruments of learning styles, Entwistle's Approaches and Study Skills Inventory for Students (ASSIST), Gregorc's Mind Styles Model and Style Delineator (GSD), Herrmann's Brain Dominance Instrument (HBDI), Honey and Mumford's Learning Styles Questionnaire (LSQ), Jackson's Learning Styles Profiler (LSP), Kolb's Learning Style Inventory (LSI), Myers-Briggs Type Indicator (MBTI), Riding's Cognitive Styles Analysis (CSA), Sternberg's Thinking Styles Inventory (TSI), Vermunt's Inventory of Learning Styles (ILS) to name only a few (Coffield et al., 2004). They identified 71 models of learning styles and categorised 13 as major that were analysed and its implications for pedagogy explored.

Each of the theories and models that currently exist attempt to arrive at a propositional stance as to either profile a learner for their inherent style or to measure via some form of instrument, learners' abilities, strengths, and weaknesses. These are used in an attempt to arrive at pedagogical approaches to improve learning. Coffield et al. (2004) further posits that: "It is important to note that not all theorists who claim a biochemical or other constitutional basis for

their models of cognitive or learning style take the view that styles are fixed for life. Two notable examples are Herrmann (1989) and Jackson (2002), both of whom stress the importance of modifying and strengthening styles so as not to rely on only one or two approaches."

The focus of this study is not to delve comprehensively into these but they are acknowledged as having had, and still do, have an impact on our pedagogical approaches. However, of the models and theories referred to in this section, the Hermann metaphorical model appears to align well with the study's focus on whole brain learning and the potential for learners to have a hemispheric preference. This model, therefore, will be explored in more detail in subsequent sections.

2.6 WHOLE BRAIN LEARNING

2.6.1 Brain-based learning

In the earlier sections of this chapter, an attempt was made to provide evidence for the interrogation of how the brain functions through citing some of the research that has been carried out in neuroscience. These studies largely interrogated the biological processes and activities in the brain using diagnostic tools such as functional magnetic resonance imaging (FMRI) and other methods in an effort to understand how the brain works and how we think.

Terms like 'Neuroplasticity' and 'Neurogenis' evolved out of the earlier research. Ming and Song (2011: 687) suggest that "The past decade has witnessed tremendous progress in addressing questions related to almost every aspect of adult neurogenesis". They further claim that: "Building upon the recent progress and aided by new technologies, the adult neurogenesis field is poised to leap forward in the next decade". Studies relating to neuroscience and learning have impacted on the way we view and approach our pedagogy to some extent but it seems that it would be prudent to find ways in which we may employ the findings from this research in the classroom.

As mentioned, this study is concerned with a perceived bias for either left- or right- or whole-brain engagement by our learners and if this bias exists, how this could inform future training of multimedia practitioners.

Caine and Caine (1990:66-70) suggested back then that the role of other factors such as emotions, experiencing stress and threat and concepts such as memory and motivation and how these affect learning were only beginning to be understood. They state further that the growing understanding of this is impacting on the way we view learning and our pedagogical approaches. They offered principles or a theoretical foundation for brain-based learning based on advances in our understanding of neuroscience. They suggest that these principals should be considered in

assisting us to rethink our approaches when selecting and designing programmes. The summarised principles that they propose are:

1. **Principle one: The brain is a parallel processor**
   They suggest that the brain is constantly involved in a myriad of functions simultaneously and that since no one approach can cater for the individual variations in the brain, we require a selection of a number of strategies to cater for the variations

2. **Principle two: Learning engages the entire physiology**
   The brain, they suggest, is a complex organ and learning is as natural and occurs as the functioning of the other physiological processes. Like other physiological processes, experiences of stress and the perception of threat affect the learning process. A brain-based approach to learning requires that factors that affect other physiological processes stress, nutrition and exercise be considered and incorporated in the holistic engagement of the learner.

3. **Principle three: The search for meaning is innate**
   The authors argue that the search for meaning is innate and natural to the brain and that we respond to things we recognise while searching for new stimuli. They also suggest that these processes occur at the same time. They believe that learning environments should provide “stability and familiarity” but also cater for the brain’s need for “novelty, discover and challenge”. They further state that stable but stimulating environments are already made available to ‘gifted’ learner but that these should be available to all learners.

4. **Principle four: The search for meaning occurs through patterning**
   Here, the authors propose that the brain seeks meaning through patterns; acknowledging related pieces of information while rejecting isolated, meaningless information. They suggest that learners should be permitted time to create these meaningful patterns during learning engagement.

5. **Principle five: Emotions are critical to Patterning**
   According to the authors, the learning experienced is affected by the state of mind, personal preferences and bias as well as self-esteem. These also affect memory according to them. This is in alignment with suggestions by other authors as discussed in section 2.3 of this chapter

6. **Principle six: Every brain simultaneously perceives**

   This principle speaks directly to the nature of this study. According to the authors: "…although there is evidence of brain laterality…left brain-right brain is not the whole story". The functioning of the hemispheres is inseparably linked and "people have enormous difficulty learning when either parts or wholes are neglected", they additionally add.

7. **Principal seven: Learning involves both focused attention and peripheral perception**

   The authors propose that the brain constantly interacts with both stimuli that are being focused on as well as peripheral information.

8. **Principle eight: Learning always involves conscious and unconscious processes**

   This principle relates to principle seven in that, as the authors suggest, learning occurs at a greater rate than we are consciously aware of and that we recall what we experienced, not exclusively what is told to us. They say, too, that "A great deal of effort is wasted because students do not adequately process their experiences. 'Active processing' allows students to review how and what they learned so that they can begin to take charge of their learning…".

9. **Principle nine: We have two types of memory: A special memory system and set of systems for rote learning**

   The authors contend that we have a memory system that they refer to as "a natural special memory system" which does not require repetition but is based on experience. It "is always engaged and inexhaustible". Dealing with facts and rote learning is dealt with differently and solely focussing on this kind of memory results in an unenriched learning experience and challenges understanding.

10. **Principle ten: The brain understands and remembers best when facts and skills are embedded in natural spatial memory**

    The learning experience is improved If content to be learned is embedded in ordinary experiences, according to the authors. They further suggest that: "Embedding is the single most important element that the new brain-based theories of learning have in

common". They suggest the embedding concepts in an experiential way and that is more sensorial and interactive enhances the learning experience of the student.

11. **Principle eleven: Learning is enhanced by challenge and inhibited by threat**
    Caine and Caine (1990:66-70) say that to optimise learning, the learning environment should be free from perceived threats and provide stimulating challenges. They refer to physiological processes that are diverted to certain parts of the brain that perceives threat such that other cognitive functions are affected.

12. **Principle twelve: Each brain is unique**
    With this principle, the authors mention that although we each have the same systems, senses, and emotions, these interact differently in each individual. They also say that learning ultimately alters the brain and therefore, as learning increases, the more distinctive we become. Learning, they contend, should cater for the uniqueness of the individuals by means of offering variety and teaching approaches should not be homogenous in its approach.

Other researchers have also explored a brain-centred approach to understanding how we learn. In his book: Teaching with the Brain in Mind, Jensen (2005) approaches the topic by first discussing the neuroscientific research that has been carried out until now (Jensen, 2005: 1-5). He further proposes a classification system for interpreting brain research and proposes, too, that at the lowest level of confidence is simple theory (Jensen, 2005:5). Simple theory is not problematic in his view provided it is recognised as such: Theory. The next level of classification (Level 2) is where some form of experiment and other exploration supports the theory. Level 3, on the confidence scale, is reached when there has been more interrogation via documented and reviewed clinical trials, usually at institutions of higher learning. Level 4 confidence is where the research evolves into various situations and environments in real-world situations.

His suggestions are tabulated in Table 2.2 below:

Table 2.2: Classification system for interpreting brain research. Table data sourced and modified from Jensen (2005:5)

Confidence level	Classification of confidence
Level 1: Brain/Learning theory	Any theory about learning and the brain that explains recurring behaviours
Level 2: Laboratory discovery	Could come from autopsies, experiments, fMRI, PET, or EEG scans.
Level 3: Clinical studies	Usually university-supported, these studies are best with multiple experimenters, large, diverse, multi-age, multicultural populations (double-blind is preferable)
Level 4: In-context applications	Done in schools or businesses, this documented action research gives us testing results under actual, real-life conditions.

Jensen (2005:6) also cautions that research into the brain might not lead to conclusive evidence but rather, that it might suggest areas of exploration that might have a greater probability of success. This study appears to be located within the Level 4 confidence level.

He proceeds to discuss some of the influencers of learning with specific reference to nutrition stating that: “Most kids eat to get rid of their hunger and lack sufficient information to eat for optimal learning. This is a concern because the essential myelination and maturation of the brain is going full speed up to 25 years of age”.

He further discusses how important enriched environments are for learning (for all students and not just ‘gifted’ students) and what role challenge and feedback play in creating improved learning environments. He states, specifically that: “The critical ingredients in any purposeful program to enrich the learner’s brain are that first the learning is challenging, with new information or experiences. Often novelty will do it, but it must be challenging. Second, there must be some way to learn from the experience through interactive feedback”.

The author continues to discuss the negative influences of stress and threat on optimal learning. He suggests that physical environments that are physically stressful affect the way the brain processes information and can lead to failure. Caine and Caine (1990:66-70), according to Principle 11, cite stress as a major antagonist to learning as well.

The author further advances that in order to create optimal and stimulating learning environments that involve the whole brain, consideration should be given to the impact that emotions, sleep, exercise and other factors have on the functioning of the brain (Jensen, 2005:25-27;32-37;54-58).

Have these brain-based learning approaches been implemented in the classroom environment?

In their study, Ozden and Gultekin (2008:1-17) investigate the effects of brain-based learning on learning and retention for two groups of learners, 22 in total, over a period of 11 days and a total of 18 hours of class time. The one group was taught using conventional methods while the other employed brain-based approaches as the teaching approach. The groups were pre- and post-tested and also equal in terms of gender. The post-test was administered again three weeks later to determine the retention levels were tested again. They found that there were statistically significant differences between the control and experimental group with respect to achievement and retention with the experimental group performing better than the control group.

In another study, Tüfekçi and Demirel (2009:1782-1791) explored the effects of brain-based learning on achievement, retention, attitude and learning on a group of third-year students. “Control grouped pre-test and post-test experimental design” was employed in the research over a period of 14 weeks. What they found is that there were significant differences in the retention, achievement, high-level learning and attitude between the control and experimental results.

That brain-based learning approaches appear to produce significant results in varied environments from school to university learners and across disciplines compared to conventional methods of teaching is evident in other studies as well (Caulfield & Kidd, 2000; Saleh, 2012; Duman, 2010; Bowman, 2003)

What do these explorations in brain-based learning mean for educators?

Attempts are made in this study to determine if students have a perceived preference for some subjects over others and if so, how do we best engage them in a more holistic way. To this effect, we explore preference-based models thinking preferences in an effort to determine if these could provide a basis for future curriculum design for the Multimedia Programme at CPUT.

2.6.2 Revisiting thinking models, instruments and theories

In section 2.5, mention was made of the various theories, models, and instruments that exist that attempt to assist educators in understanding how learners engage. Some instruments like the Myers–Briggs Type Indicator (MBTI)® emphasise personality traits in their measurement of a person's personality type, strengths, and preferences. It is linked to personality type instruments that measure personality traits such as “extraversion, openness, agreeableness,

conscientiousness and neuroticism" (Coffield, et al., 2004:46-49). The authors further suggest that: "The MBTI, while it focuses on the personality type of the individual, has a well-established role in locating and understanding interpersonal and community dynamics". However, they further caution that: "Despite the enormous commercial success of the MBTI, the research evidence to support it – both as a valid measurement of style and as an aid to pedagogy – is inconclusive, at best."

Another model of learning styles, the Kolb Learning Style Inventory (LSI), was developed by David Kolb in the earlier part of the 1970s and has subsequently initiated considerable research.

According to this model, Kolb (1984, cited in Coffield, et al., 2004:62) suggests that: 'learning is the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping experience and transforming it."

Kolb proposed the following learning styles (Coffield, et al., 2004:60-70):

Type 1: The converging style (abstract, active)

> Is concerned with abstract concept engagement and active experimentation. Has a preference for problem-solving rather than interpersonal interaction.

Type 2: The diverging style (concrete, reflective)

> Prefers actual experience and reflection, is imaginative and takes an interest in people and veers towards being feeling-oriented.

Type 3: The assimilating style (abstract, reflective)

> Prioritises abstract conceptualisation and reflection; is reason and inductive in their approach and more slanted towards ideas and abstraction than with people; values logic over practical ideas.

Type 4: The accommodating style (concrete, active)

> Prefers concrete experience and active experimentation; is adaptive to changing circumstances; is plan and goal-oriented and a problem solver but often considered impatient.

The two models discussed above, while popular in the literature, refer specifically to personality traits, experiential learning, imagination, experimentation, and emotions, they do not speak directly to the idea of potentially hemispheric biases in their approaches.

Some authors have differed with the proposition of 'Learning Styles' and have asserted that these are myths. Kirschner (2017: 166-171), for example, asserts that most learning-styles-based models and theories rely on classifying individuals into group types. He argues that there is minimal support or evidence from objective interrogation to support this. He further suggests that research that reports evidence of a particular style falls short of satisfying important aspects of scientific validity. He further asserts that learning styles actually box people into a specific and exclusive group. He also expresses concern about the validity, reliability and predictive abilities of the tests often used with styles classification and posits that test-retest reliability is low for these classification tests.

Another author, Brown (2003), believes that:" When students' learning preferences match their instructor's teaching styles, student motivation and achievement usually improve, but some students may do better with a learning/teaching style mismatch. Learners need to become better all-around learners by adapting their learning style to non-preferred teaching styles."

This study is concerned with exploring why students prefer some (more technical) subjects over say, visual aesthetic design subjects and also attempts to determine if there is a hemispheric bias in engagement with the subjects. If this is true, how then do we proceed to engage our learners in the best possible way?

2.6.3 The Herrmann Four Quadrant Whole Brain Model

The model that probably aligns best with the earlier research by Sperry (1996:1749-1757), Ornstein (1997) and MacLean (1952) where a more hemispherical preference approach is the basis for the model would be the Herrmann Four Quadrant Whole Brain Model.

Ned Herrmann developed the Whole Brain® model and the Herrmann Brain Dominance Instrument (HBDI) which has been employed in various contexts including business and management, personal growth, education and counselling (Coffield, et al., 2004:76). The HBDI proposes a four-category classification system of mental preferences. Herrmann attempted, at first employing electroencephalographic (EEG) exploration, to identify the correlation between Sperry (1961:1749-1757) and MacLean's (1952:407-18) earlier work and the EEG patterns to identify specialised left- and right brain activity but achieved limited success. Herrmann did subsequently incorporate the proposed functions of the limbic system as hypothesized by MacLean into his model. The four categories of his model are summarised as follows (Coffield, et al., 2004:77):

A Theorists (cerebral, left: the rational self)

Theorists find it challenging to allow for their feelings and the humanitarian approach.

B Organisers (limbic, left: the safe-keeping self)

Organisers find it trying to allow for their experimental part and innovation.

D Innovators (cerebral, right: the experimental self)

Innovators find safe-keeping and the organising challenging

C Humanitarians (limbic, right: the feeling self)

Humanitarians find allowing for the rational self and the theoretical style challenging.

The earlier research performed by Sperry (1961:1749-1757), Ornstein (1997) and MacLean (1952) gave rise to the Herrmann Whole Brain Model. They emphasised the specialised functions associated with the left and right hemispheres of the brain. They proposed that the left hemisphere deals with logic, analytical, quantitative, rational and verbal processes. The right hemisphere, they proposed, deals with concepts, is more holistic, intuitive and imaginative and non-verbal. (Du Toit, et al., 2001:186). The authors tabulate the functions associated with each hemisphere as shown in Table 2.3 below.

Table 2.3: Specialised functions associated with each brain hemisphere. Adapted from Trotter 1976:219, cited in Du Toit, et al., 2001:186)

Left hemisphere	Right hemisphere
Speech / verbal	Spatial / music
Logical, mathematical	Holistic
Linear, detailed	Artistic, symbolic
Sequential	Simultaneous
Controlled	Emotional
Intellectual	Intuitive, creative
Dominant	Minor (quiet)
Wordly	Spiritual
Active	Receptive
Analytical	Synthetic, gestalt
Reading, writing, naming	Facial recognition
Sequential ordering	Simultaneous comprehension
Perception of significant order	Perception of abstract patterns
Complex motor sequences	Recognition of complex figures

It is important to note that even though the individual hemispheres have specialised functions, there is integration in their activity that is ensured by physical connections Herrmann (1996:42, cited in Du Toit, et al., 2001:186). It is important to note, too, that: “Although Herrmann began with a brain-based theory of hemisphere dominance, he later accepted that this was an oversimplification with inadequate empirical support and recommended (1989, 63) that A, B, C, D quadrant terminology be used instead: ‘The whole-brain model, although originally thought of as a physiological map, is today entirely a metaphor.’” (Coffield, et al., 2004:77).

Coffield, et al. (2004:77) further point out that: “The quadrant model and the concept of ‘dominance’ is not meant to imply that most people have a strong preference for one quadrant only. In fact, Herrmann states that this is true of only 7% of the population studied. The most common pattern (for 60%) is to have strong preferences in two quadrants, followed by strong preferences in three quadrants (30%). Only about 3% of those assessed have what is termed a ‘quadruple dominant’ or ‘whole brain’ profile.” They further cite Herrmann as saying that these individuals have an exceptionally balanced perception of any situation and can communicate easily with others who do not share the same profile and even be ‘translators’ among people with different profiles.

The four quadrant model is depicted in Figure 2.3 below.

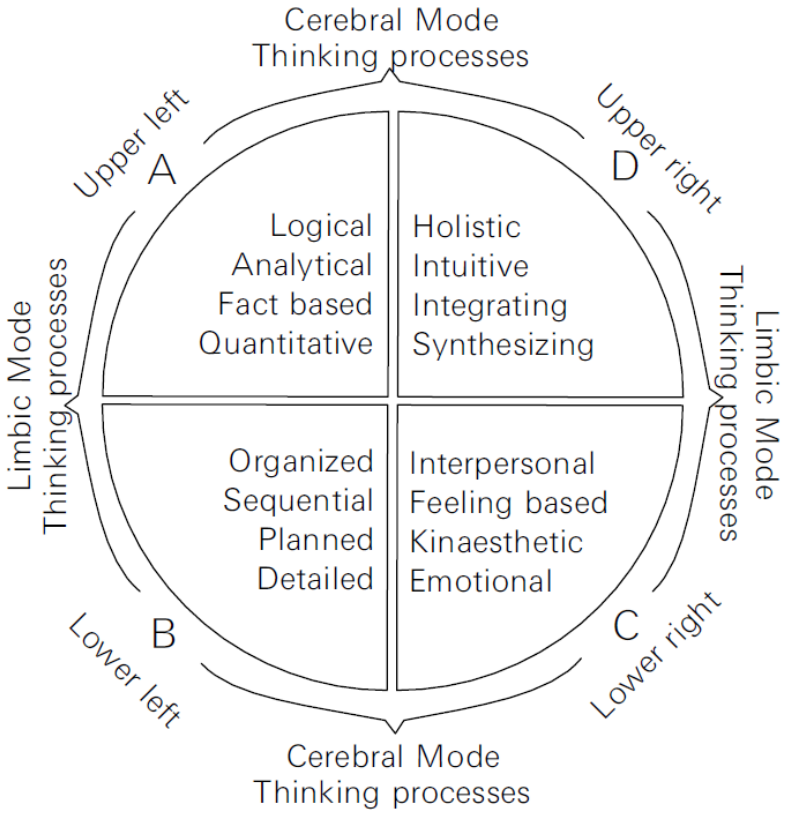


Figure 2.3: Brain hemispherical lateralisation (Herrmann 1995:411)

There are four modes to the model. These are the left and right which originate from the work done by Sperry. MacLean's triune brain model influenced Herrmann's work in producing the proposed cerebral and limbic modes where the cerebral is more cognitive and intellectual while the limbic mode is thought to be structured, visceral and more emotional (Herrmann, 1995).

Note that these modes depend on the particular situation and are interactive in their functioning contributing to a complete brain where one or more parts naturally become dominant. "The dominance between the paired structures of the brain provides the basis for measuring the level of dominance. The Herrmann Brain Dominance Instrument (HBDI) is an assessment tool that quantifies the degree of a person's preference for specific thinking mode". The HBDI is a self-assessment tool composed of 120 questions to be completed by the individual. This tool emanates from 20 years of research on brain dominance (Du Toit, et al., 2001:187).

The authors further explain that out of the self-assessment exercise, a thinking preference profile is produced which is displayed on a grid with four quadrants and scored. These scores can range from below 10 to above 150. It is further proposed that the higher the score in a particular quadrant

is, the more, it is thought, is the preference for thinking in that quadrant. A preference code is assigned which is determined by the size of the score in each quadrant. These are summarised in Table 2.4 below.

Table 2.4: Preference scores and codes used in the HBDI. (Adapted from Du Toit, et al., 2001:187)

Preference code	Label	Score	Preference level
1	Primary	>100 67-100	Very strong Strong
2	Secondary	34-66	Intermediate – representing modes that are comfortable and easily available
3	Tertiary	<34	Low – suggesting low interest or even avoidance

An example of a profile showing how this particular individual scores and what their particular preference appears to be is shown in Figure 2.4 below.

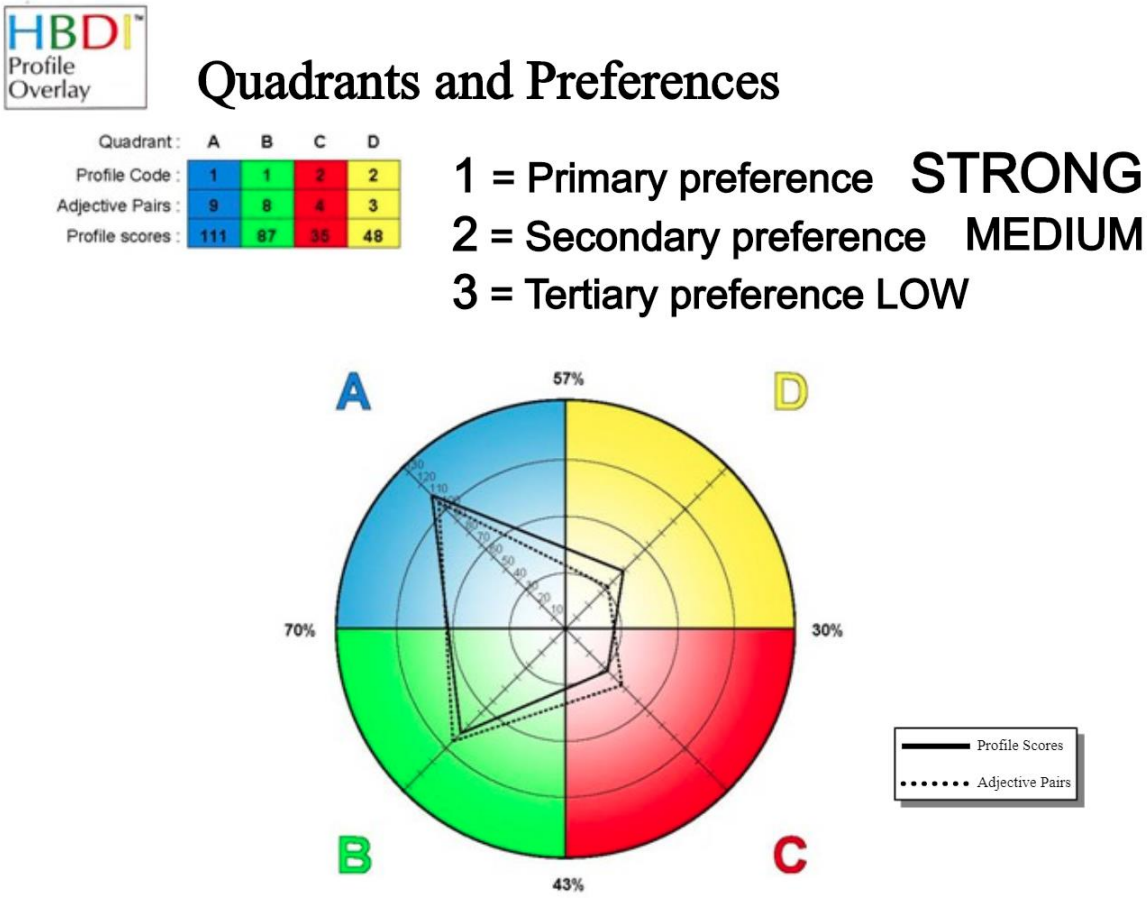


Figure 2.4: Thinking profile of a single individual (Herrmann International, 2007)

Based on the preference scoring scale in Table 2.4, this individual shows a very strong preference for quadrant A thinking and a strong preference for quadrant B thinking but intermediate and low preferences for quadrant D and C thinking.

An example of the resulting thinking profile that results after the assessment of a husband and wife is shown in Figure 2.5 below

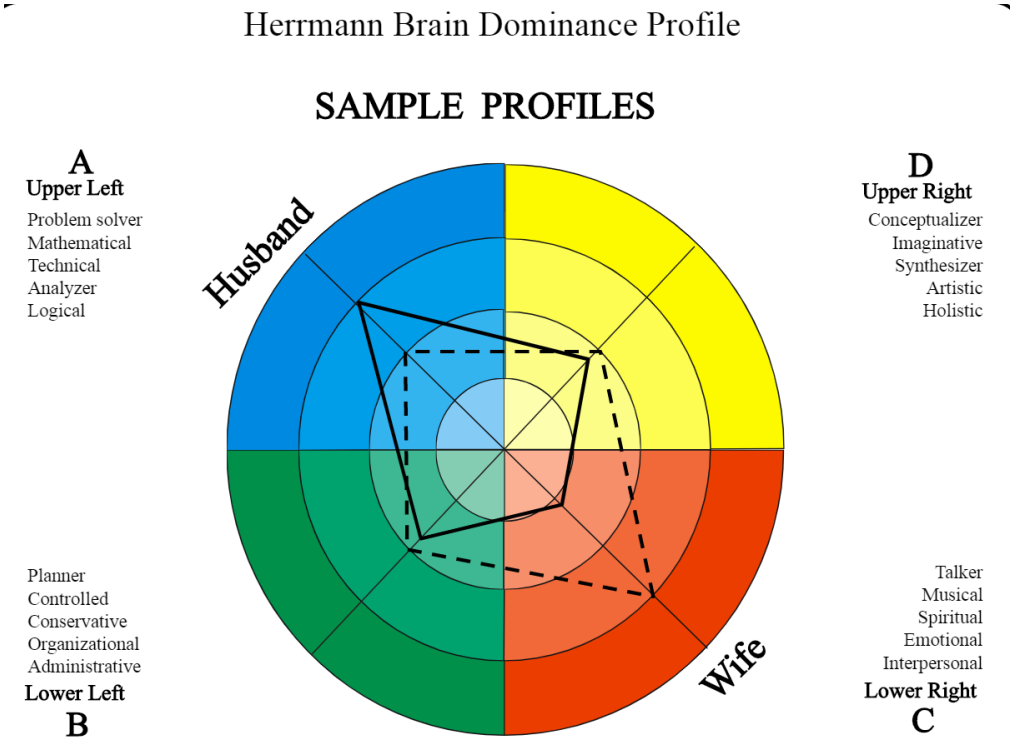


Figure 2.5: Thinking profile of two people (Herrmann International, 2007)

Herrmann (2007) argues that preferences or choices could draw us to particular occupations. He uses the example of sample occupations in a hospital setting to show the potential for alignment with thinking profiles and the types of occupations individuals might be drawn to. An example of this is shown in Figure 2.6.

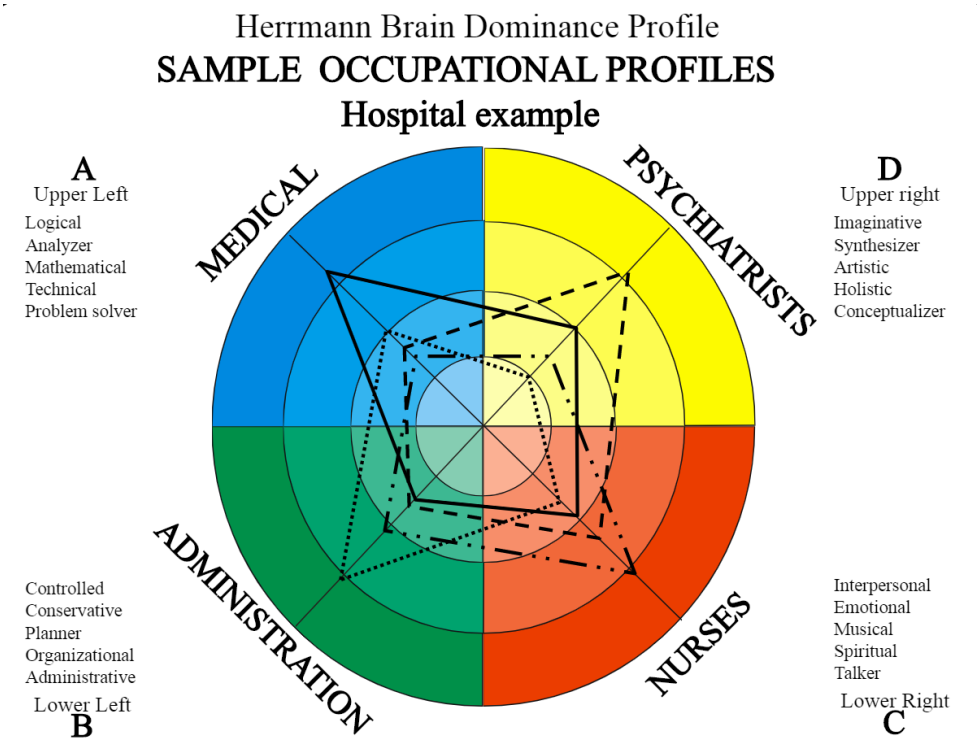


Figure 2.6: Occupational profiles in a hospital setting (Herrmann International, 2007)

According to Herrmann (2007): "The 'mentality' of the universe of occupations is distributed across all of the quadrants and modes of the whole brain model. This mentality and occupational norms can be displayed in the form of a profile." He suggests, too, that since the world is made up of a composite of profiles, we could potentially create a universe of categories for various occupations. He mentions that this is what 'could' typically be seen but various combinations are possible and are situational. This is shown in Figure 2.7.

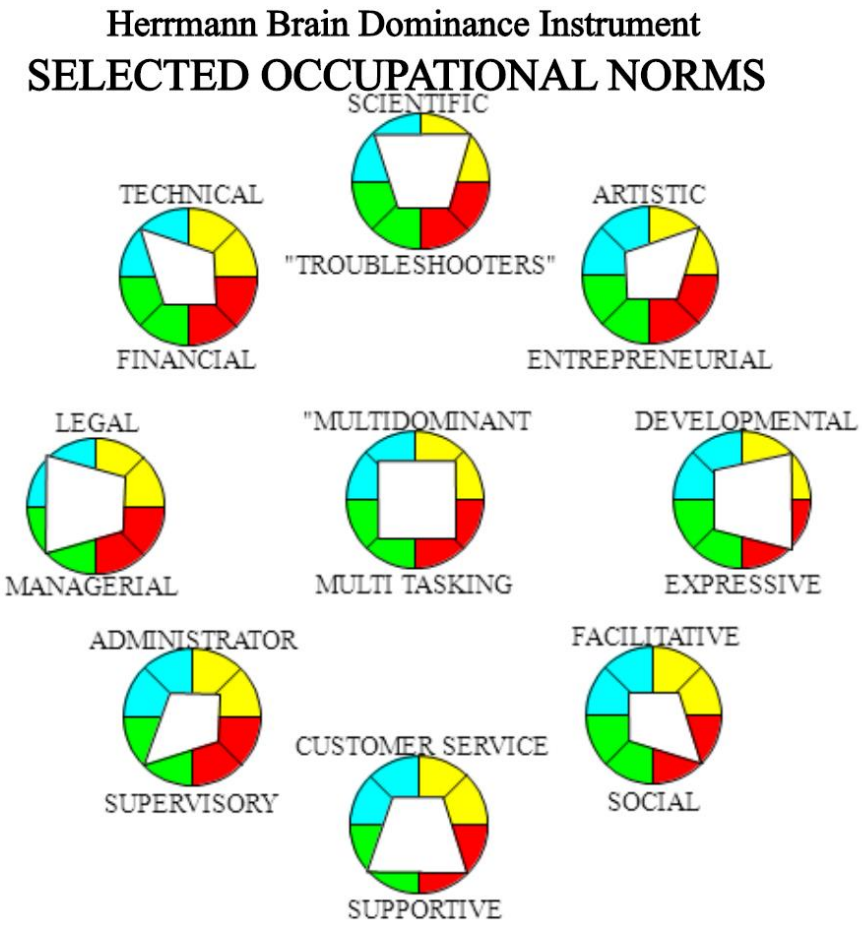


Figure 2.7: Universal thinking profiles (Herrmann International, 2007)

An in-depth, comprehensive exploration of the Herrmann model and all of its permutations are beyond the scope of this study. It does present, it appears, a point of departure for considering the types and levels of engagements we practice in the classroom.

What are the implications for teaching and learning of the Whole Brain® model?

2.6.4 Implications for teaching and learning of the HBDI

Coffield, et al. (2004:138) suggest that Herrmann's 'whole brain' model is well suited for learners, teachers and in business in that it illuminates interpersonal dynamics as well improves awareness and understanding of the individual and others. To this effect, Herrmann and others have developed approaches based on this model to effect personal and institutional change. The authors further contend that "Herrmann's model may prove especially valuable in education and training since its raison d'être is to foster creative thinking and problem solving". The Herrmann model shows that people have different thinking profiles so the authors further argue that it is improbable that effectual change will occur in the continued learning experience until it is acknowledged that not all learners function optimally when given precise rules to follow.

The authors also cautioned in 2004, though, that the Herrmann approach to teaching and learning required further interrogation and independent scrutiny insofar as education is concerned. They further posit that despite this advice, “it is grounded in values which are inclusive, open, optimistic and systematic. More than any other model we have reviewed, it encourages flexibility, adaptation and change, rather than an avoidance of less preferred activities”.

Herrmann did evolve a model particularly aimed at teaching and learning. This is encapsulated in Figure 2.8.

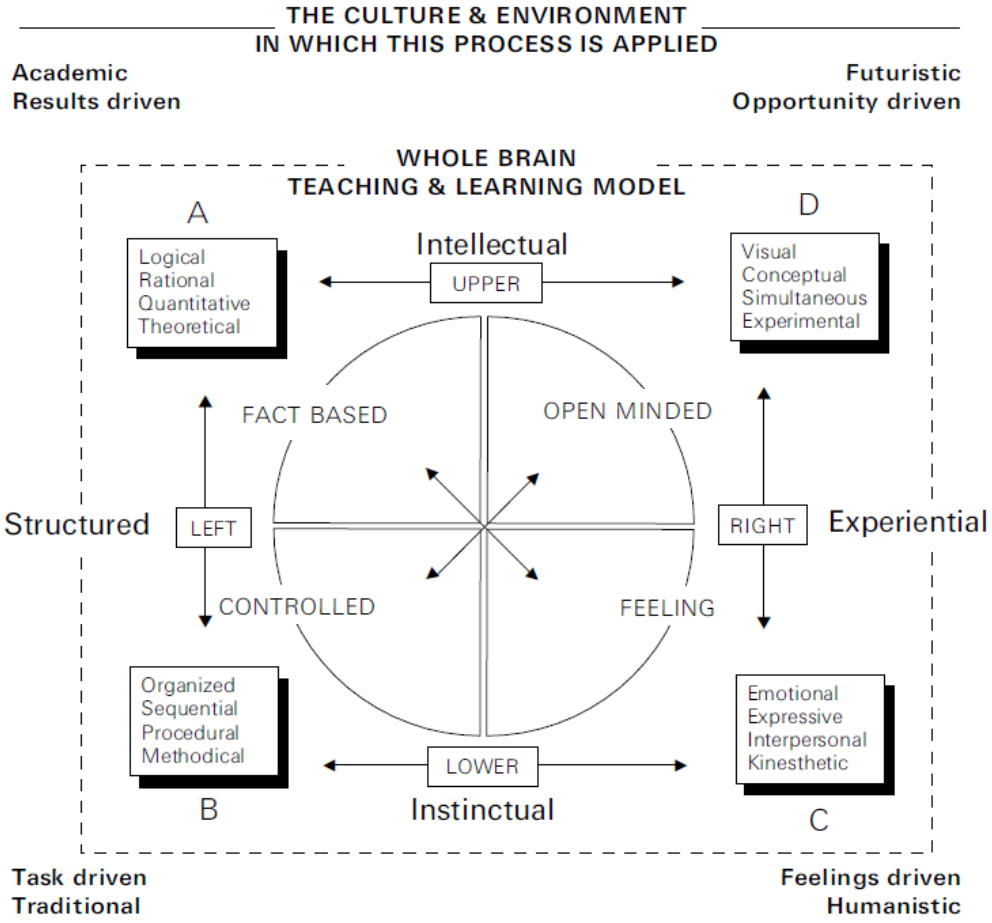


Figure 2.8: A whole brain teaching and learning model (Herrmann 1995:155, cited in Du Toit, et al., 2001:188)

Du Toit, et al. (2001:189) say that for Figure 2.8, the learner and facilitator are placed at the centre (as the preferred position in a whole-brain ecosystem – including the endogenous and exogenous factors such as culture and society). The arrows indicate the inherent features of activities as they relate to the interconnected physiological parts of the brain. The left, more structured, mode is associated with logic, rational thought, critical thinking and quantitative processes and it is where

the systematic, sequential and organised activities are focused. The right mode, on the other hand, deals with visual, conceptual, emotional and interpersonal activities. They contend that: “The inclusion of all these modes in learning/teaching activities comprises a full range of activities”.

How has the evolution of the whole brain teaching using the HBDI approach been perceived and explored by researches subsequently?

Publications have emerged where researches have employed the Herrmann Whole Brain Teaching Method (HWBTM) teaching approach and claim statistically relevant deviations from the control and the test group. Bawaneh, et al. (2012:3-22), for example, used the Herrmann Whole Brain Teaching Method to investigate how effectual the method would be in improving learners’ motivation to learn science. They randomly selected 357 students of which 183 (constituted of 98 males and 85 females) were given instruction using the Herrmann Whole Brain Teaching Method while the balance (constituted of 82 males and 92 females) were instructed using a Conventional Teaching Method. Their study concludes that the HWBTM exceeded conventional methods in improving students’ motivation to learn science.

In another study, Horak, et al. (2001:202-209) set out to demonstrate how the four quadrant approach could be applied in facilitating the learning of non-technical skills for engineering students. Fifty first-year engineering students were measured using the HBDI to understand their thinking preferences. They found that when the 50 profiles were superimposed, it indicated thinking preferences in all four quadrants as was expected according to Herrmann’s theory. The average student, however, demonstrated a preference for left hemisphere thinking modes, which, according to them, is typical of engineering students. They suggested, subsequently, that: “In order to develop their full potential, engineering students and teaching staff alike should become aware of and develop cognitive skills associated with the four quadrant whole brain model”. They also contended that: “For the engineering students, as well as the lecturers involved in this project, it became apparent that traditional approaches to educational design and delivery could fall short of desired results when dealing with a composite group of learners with thinking style preferences distributed across all four quadrants of the whole brain model.” Also, that: “Teaching activities should ideally be designed to dynamically move back and forth incorporating all four quadrants of the whole brain model.”

2.7 CONCLUSION

The objective of this chapter was to introduce the theoretical and conceptual framework for the research. In order to do this, the term ‘Multimedia’ was explored in order to form the reference against which this research was required to be contextualised.

Since the focus of this study was to understand how learners arrive at particular preferences, it was necessary to also briefly explore and acknowledge that there are many factors which affect students' learning. It was also necessary to understand what cognitive skills were required, particularly for Multimedia students since this was the focus of the study. In order to do this, attempts were made to provide some history and advances made in neuroscience and its implications for education.

Though not the focus of the study, the literature regarding learning styles, personality types and learning preferences were also explored since these have long been considered important in providing theoretical underpinnings for education research.

Brain-based learning approaches were explored, subsequently, as this is the point of departure for further exploration in the study.

In the following chapter, the research approach, methodology and methods employed in this study are discussed.

CHAPTER 3: RESEARCH METHODOLOGY AND DESIGN

3.1 INTRODUCTION

Chapter 1 attempted to offer justification and motivation for the study. In it, the tension that exists within Multimedia in its current dispensation was discussed as relates to there being a perceived bias or preference by students to either concentrate on the more design-related aspects of the course or on the more technical and coding aspects of the course.

This chapter details the research methodology followed during this study. The research paradigm adopted is also discussed. It attempts to build on from the information covered in Chapter 2 where the literature was explored and discussed with a view of deriving the findings covered in later chapters.

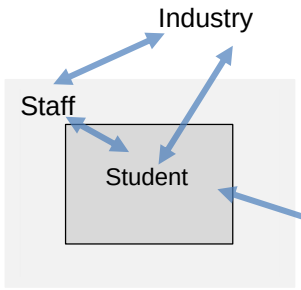
3.2 RESEARCH APPROACH

The research involves an interpretive approach whereby an attempt to observe and understand the qualitative data collected is central to the study. The research process logic diagram is depicted in graphical form on the next two pages.

RESEARCH PROCESS LOGIC

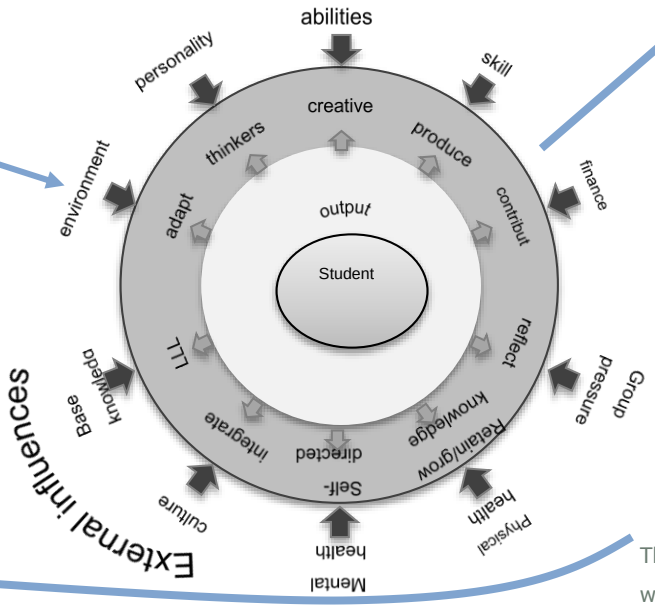
Problem environment and context

The multimedia academic engagement and practice environment



Learner's environment – macro view

Learner affected by in and out of classroom influences before arriving, and during their stay at university



Narrowing the area of interest: The challenge of disciplines like Multimedia

Amongst all the influences, the focus narrows to: How do we best engage learners in disciplines like Multimedia to achieve the right balances where they are expected to function across the Technical-Aesthetic Continuum?

Technical-Aesthetic continuum

Technical	Aesthetic

Questions

- Do we focus on selection and training?
- Do we focus on selection?
- Do we **focus on training?**

Focus of the research

The research will focus on the **training** aspect of Multimedia learners working towards an Instructional approaches to support holistic training across the technical-aesthetic continuum

Problem statement

There is a lack of understanding within the training programme of Multimedia Technology students how it is that learners appear to prefer working anywhere within the range of the technical-aesthetic design continuum. This is important since MMTECH, as an academic discipline, and certainly multimedia practice, draws mainly from Aesthetic Design, Audio and Video Technology and the Programming aspect of Information Technology. MMTECH students within the current curriculum dispensation migrate to either being more Design-orientated or more IT/Technology-orientated; only a relatively small number of students become truly specialist MMTECH graduates that can function in a whole brained way.

Aim of the research

The aim of the research is to explore the dimensions of instructional approaches that inform training to improve whole brain engagement in academic engagement and therefore to inform multimedia practice.

Research philosophy and paradigm:

We seek to understand and explain how students behave in a certain way with a view that it informs an improved general approach to realising a more holistic learning environment, the study is thus grounded within interpretivism (anti-positivist) philosophy. This paradigm falls within the interpretive domain and makes the assumption that reality is multifaceted and subjective and informed by experience and human social context and is best understood within the context of the subjective experience.

Ontological position: (construction of reality)

Multimedia Ecosystems

- Making sense of the complex environment
- Understanding the classroom environment
- Exploring the SME Multimedia industry (Focus)
- Exploring Teaching and Learning approaches

Epistomological position: (pursuit of truth)

Unit of Analysis

Focus: Interpret perceptions

- Student experience
- Lecturer experience
- Industry experience

Continue to next page

Figure 3.1: Graphic depicting the research process logic (Source: Author's own construct)

Questions, Methods and Objectives

Continued from previous page

Research Question	How do we develop instructional design approaches to be employed within the Multimedia Technology academic programme in order to promote whole-brain engagement that defines multimedia practice?

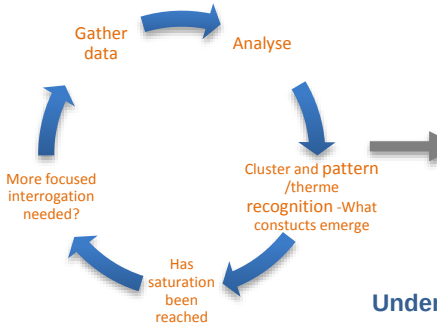
Methodological approach and design:

Within the context of the interpretivist paradigm, the methodological approach will be subjective and qualitative and the approach to be followed will include: Structured and semi-structured Interviews (face-to-face), formalised literature analysis and surveys. The research design assumes a phenomenological stance since we seek to study the individual's lived experiences

Research Sub-Questions	Method(s)	Objectives
1. How does Multimedia discipline present globally?	Formalised literature analysis.	Establish the current nature of the Multimedia discipline so as to determine the parameters to be explored and reach a consensus in understanding what is required for the development of Multimedia professionals
2. How do learners engage within the range of cognitive skills within Multimedia training?	Interviews	Determine the range of skills and type of engagement requirement for the development of Multimedia professionals
3. Why is it that there appear to be academic engagement preferences within the multimedia programme at CPUT?	Interviews	Determine the preferences of learners within the Multimedia Programme at CPUT

Data analysis:

Aim is to seek meaningful and symbolic content in the qualitative data. An inductive approach will be employed, clustering and identifying relationships and recurrent themes. Questions will initially be open ended but becoming more precise as information/patterns/themes emerge – adopting a circular, iterative and progressive approach



Derive information

Underpinning theories and models

Synthesis and validation

Propositional knowledge:

Arrive at declarative statements which purport to describe the nature of a holistic technical-aesthetic instructional design

Proposed contribution:

- Knowledge
- Theory/praxis

Instructional approaches

The following is an explanation of the graphic depicts. The explanations which ensue attempts to unpack each section of the graphic

The problem environment includes the students and staff at CPUT and industry which is referred to as the Multimedia academic engagement and practice ecosystem.

From, the graphic, if a macro view is assumed of the learner's environment, it was mentioned (in Chapter 2) that learners are affected by many factors before arriving at university and during their stay here. These include but are not limited to:

External influences

The physical learning environment, innate abilities and skills, finances, physical and mental health, university culture, group pressure etc.

They are expected to perform in a certain way and possess certain attributes which include, but are not limited to:

Expected outcomes

Thinkers, be creative, produce artefacts, contribute in groups and class, be adaptive, be self-directed, retain and grow knowledge, be reflective, be life-long learners etc.

Within this framework of all the challenges faced by learners in disciplines such as Multimedia, the focus of the study is to explore what the right balances are relative to the apparent technical-aesthetic continuum by first understanding their preferences. The questions that arrive out of this focussed exploration are:

Do we focus on selection and training?

Do we focus on selection only?

Do we focus on training?

The focus of this research was to focus on the training aspect of Multimedia learners with a view of understanding their preferences an so that it would better inform future instructional approaches to support a holistic training ecosystem to cater for all learners across the technical-aesthetic continuum.

Figure 3.1 attempts to describe the entire research process, methodology, paradigms, data analysis and proposed outcomes. These are discussed further below.

3.3 Research paradigm

Since, through this study, we seek to **understand** and **explain** why students have a perceived preference with a view that it informs an improved approach to realising a more holistic learning environment, the study is interpretivist in nature (Cronje, 2011) and Burrell & Morgan (1979:21-39). This paradigm makes the assumption that reality is multifaceted and subjective and informed by experience and human social context and is best understood within the context of the subjective experience (Bhattacherjee, 2012:103) and (Roode, 1993). Interpretivist research also implies that the researcher is observing social phenomena, embedding within the research in the observation of the data, interpreting the data from the perspective of the subjective participants (Interpretive analysis) and immersive in nature (Bhattacherjee, 2012:105-106). Walsham's (1993:5) suggests that "interpretive methods of research start from the position that our knowledge of reality, including the domain of human action, is a social construction by human actors and that this applies equally to researchers. Thus there is no objective reality which can be discovered by researchers and replicated by others, in contrast to the assumptions of positivist science."

Since, as mentioned, we seek to observe and understand learner behaviour in the particular contextual location of the Multimedia Technology programme, it appears that the research aligns well with the proposed paradigm of choice

3.4 Research methodology

Within the context of the interpretivist paradigm, the methodological approach is subjective and qualitative and the approach that was followed included: Semi-structured Interviews (face-to-face), formalised literature analysis (documentation - institutional and other documents were used). The research design assumes a phenomenological stance since we seek to study the individual's lived experiences. (Bhattacherjee, 2012:106.) According to (Bhattacherjee, 2012:73.) "…the method can be used for descriptive, exploratory, or explanatory research. This method is best suited for studies that have individual people as the unit of analysis."

The data analysis is qualitative since: "Qualitative researchers are interested in understanding the meaning people have constructed, that is, how people make sense of their world. (Merriam, 2009:13)

3.4.1 Qualitative data types

Given the possible range of qualitative data types that could emerge from the research, it becomes necessary to describe the types and approaches that were employed

Ryan and Bernard's (2010:769-802) posits a typology of qualitative research which surrounds the idea that qualitative data is comprised of text, images, and sounds. They also propose that text is further subdivided into two primary components: Text as an object of analysis and text as a proxy for experience..

Since this research's methodological approach encompassed the employment of semi-structured interviews producing transcripts of text and also the institutional documents that were analysed, it seemed appropriate to follow the routes as indicated below in Figure 3.2.

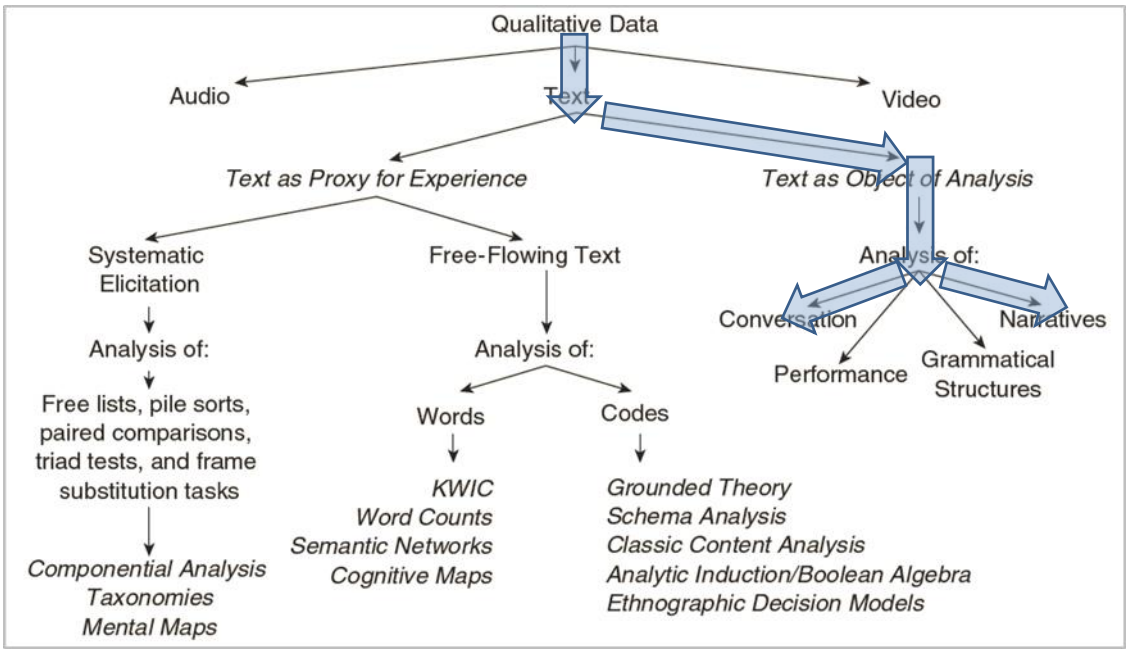


Figure 3.2: Adapted typology of qualitative analysis techniques (Adapted from Ryan & Bernard, 2000:771)

3.5 RESEARCH APPROACH AND IMPLICATIONS FOR DATA COLLECTION

Smith et al (2009:11) define phenomenology as "a philosophical approach to the study of experience shares a particular interest in thinking about what the experience of being human is like, in all of its various aspects, but especially in terms of the things that matter to us, and which constitute our lived world."

Since the aim was to seek meaningful and symbolic content in the qualitative data an inductive approach was employed, clustering and identifying relationships and recurrent themes. Questions were initially open-ended but becoming more precise as information/patterns/themes emerge – adopting a circular, iterative and progressive approach

Since the aim was to use questions to arrive at an understanding of our students' and other interviewee's individual experiences this research approach could be described as phenomenological with features and implications as described in Table 3.1 below.

Table 3.1: Research approach and implications for data collection. Adapted from Guest et al. (2013:8)

Type of Approach	Defining Features	Data Collection Implications
Phenomenology	• Focuses on individual experiences, beliefs, and perceptions. • Text used as a proxy for human experience.	• Questions and observations are aimed at drawing out individual experiences and perceptions. • In-depth interviews are ideal methods for collecting phenomenological data

The approach that was employed involved the following (as tabulated in Table 3.2):

Table 3.2: Area of exploration, methods, research participants and expected outcomes

Area of Exploration	Method	Potential participants or sources	Outcome
Understanding student experience	Face-to-face interviews	7 x Level 3 and BTech Students	Student perceptions of the Multimedia programme
Understanding Industry perceptions	Face-to-face interviews	3 x Industry representatives	Industry perceptions of what Multimedia skills need to be in place
Understanding academic experience	Face-to-face interviews	3 x Staff members	Staff perceptions of the Multimedia programme
Curriculum documents	Sourcing and analysing documents	Institutional archives	How the Multimedia course is taught

3.6 UNIT OF ANALYSIS

The unit of analysis in scientific research refers to the “what” of the study, for example,

the “object, phenomenon, entity, process, or event” that is being investigated (Babbie & Mouton, 2001:84). Within the unit of analysis, the exact part or identity, quantity and detail of the phenomenon on which the actual observation will be conducted (the unit of observation) needs to be identified. The units of analysis and of observation are present” or as Guest et al. (2013:26) put it:” The unit of analysis in a study is the level of abstraction at which you look for variability.The most commonly used unit in social-behavioral research is the individual.”

It became important to identify the unit of analysis within this study because as Ryan & Bernard (2010:129) suggests; it could range from an event (are we exploring a single episode) to an entire country or larger population. They graphically depict this as in Figure 3.4 below.

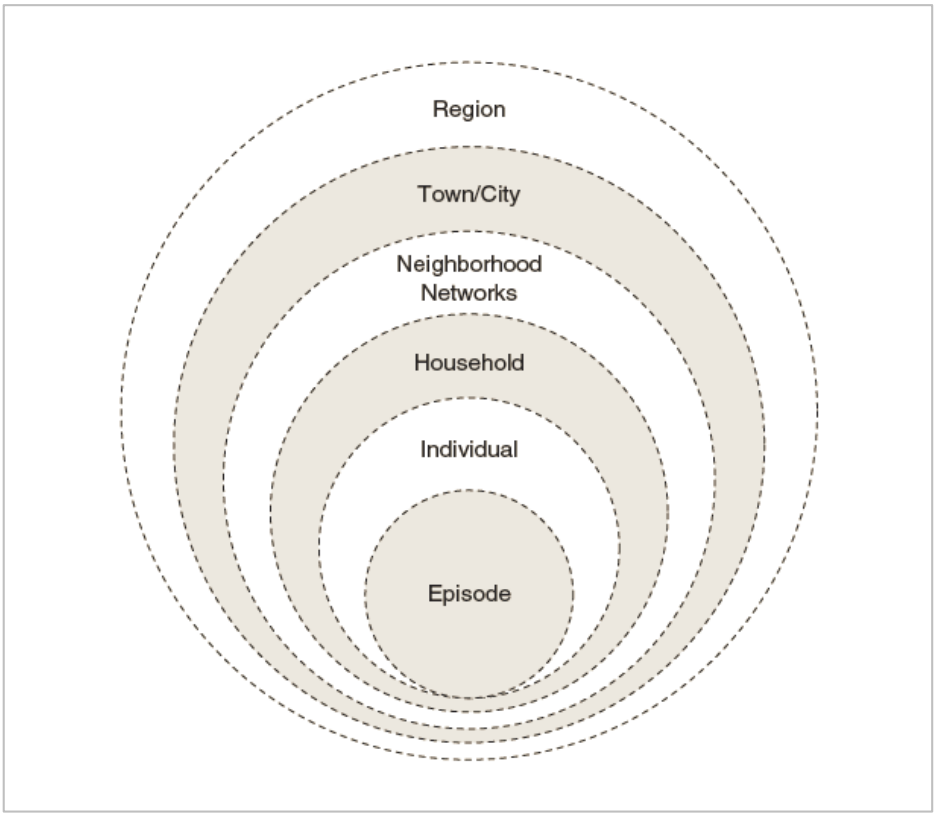


Figure 3.3: Levels of analysis techniques (Ryan & Bernard, 2000:129)

The units of investigation, analysis, and observation are depicted in Table 3.3.

Table 3.3: Units of analysis and units of observation. Adapted from Mlitwa (2011:104)

	Group	Individual Actor	Activity
Unit of Investigation	Research Population: Higher Education Institutions and Industry	Research Population: Learners, Educators, Industry Practitioners	Research Population: Teaching & Learning Practices
Unit of Analysis	Universities Offering Multimedia and Industries Engaged In Multimedia Practice	South African and International Learners, Educators, Industry Practitioners	Student and Practitioner Activity Preference
Unit of Observation	Specific Departments within Universities and Industry Involved With Multimedia	Sample South African and International Learners, Educators Within Departments Offering Multimedia and Industry Practitioners Engaged in Multimedia Practice	Factors Affecting Student and Practitioner Activity Preference

3.7 DATA COLLECTION METHODS

Bhattacherjee (2012:69) suggests that: “Sampling is the statistical process of selecting a subset (called a “sample”) of a population of interest for purposes of making observations and statistical inferences about that population. Social science research is generally about inferring patterns of behaviors within specific populations.”

3.7.1 SAMPLING TECHNIQUE

Since this is qualitative research, a non-probability sampling approach was adopted. This did not result in statistically representative data. The technique employed was purposive sampling where a non-random sample was drawn from the target group. The characteristics of individuals are used as the basis of selection and chosen to reflect the diversity and breadth of the sample population (Bhattacherjee, 2012:69-72).

3.7.2 THE SAMPLING PROCESS

The sampling process involved: Defining the target population (linked to the unit of analysis), choose a sampling frame, or section of the target population, and choosing a sample from the frame using a sampling technique as described earlier (Research Methodology, 2015). The population under exploration, the sampling frame as well as the sample description is described in Table 3.4.

Table 3.4: Population, sample frame and sample selection

Population	Sampling Frame	Sample
Students and Staff at CPUT Multimedia graduates in Industry CPUT	Students at CPUT Local Industry Local Industry	Purposive sample selection of students from third-year level and BTech from the programme and Multimedia teaching staff Purposive sample selection of graduates in industry

The industry interviewees were chosen because they had either been students of the programme before and have been active in the industry for at least five years or because they had taught on the programme at some point. This was purposely done since it was assumed that they would have unique insights into how their learning influenced their adjustment to industry and whether their years of experience could guide the study further in understanding the necessary skills that our graduates required.

The students were chosen after careful discussion with their lecturers. Since this was purposive sampling, the lecturers were engaged about typical students that exhibit notable differences in engagement and performance in the technical or design subjects and whether there were students who engaged and performed well across-the-board meaning, the students showed strong or significant performance in either or both. The lecturers were approached separately (without each

other's knowledge) and asked to nominate candidates based on the criteria above. These nominated names were then compared after and where there were overlaps, these were the students who were chosen.

3.7.3 SAMPLE SIZE CONSIDERATIONS

The concept *data saturation* (developed originally for grounded theory studies but applicable to all qualitative research that employs interviews as the primary data source) "entails bringing new participants continually into the study until the data set is complete, as indicated by data replication or redundancy. In other words, saturation is reached when the researcher gathers data to the point of diminishing returns, when nothing new is being added" (Bowen, 2008, cited in Marshall et al., 2013:11).

For the interviews, saturation was reached early. What ensued thereafter was more detailed and profound questioning to attempt to understand the student and industry practitioners' perceptions more comprehensively.

Nastasi (n.d.) suggests that there are no hard and fast rules when it comes to the selection of the ideal sample size when it comes to qualitative research but that one should consider:

1. *The sample size required to reach saturation or redundancy* – i.e. how large a sample needs to be in order for consistent patterns to emerge or where there is nothing new left to learn
2. *The sample size needed to display variation in the population* – i.e. the size needed to assess variation or diversity in the population under study

Nastasi (n.d.) further suggests that a rule of thumb to use is that, for phenomenological research approaches, the sample size should be 10 but if saturation is reached earlier, then no more should be used. Further suggestions by Nastasi (n.d.) were that for interviews, an average session timing of 20 – 40 minutes would be adequate.

It is with this view in mind that the sample sizes were chosen and the average timing for the interviews was 35 to 55 minutes long.

3.7.4 EXAMINING THE DOCUMENTS

It was important to understand the current academic engagement within CPUT so an examination of the relevant documentation relating to the entrance requirements and course documents. The subject guides or learner guides, as they often referred to, were all collected and three samples

are attached in Appendix II. These documents give clues to the nature of the topics and the types of engagement.

The topics and outcomes were extracted out of the learner guides and interrogated determine the nature of the topic with a view of determining if they dealt with design, technical and coding aspects or somewhere in between. These are presented in Chapter 4.

3.8 DATA ANALYSIS

Since we are attempting to understand people's lived experience and perceptions through interaction and interviewing them, the perceived reality of the people under study is reported. The perception of the researcher of the reported experience is part of this process so an observer-independent approach is not possible in this research. In fact, many of the world's scientists, in many fields of study agree that an observer-independent view of the world is not achievable. (Guest et al., 2013:8). The notable physicists, Stephen Hawkin and Stephen Hawking and Leonard Mlodinow, suggest that:

"Model-dependent realism is based on the idea that our brains interpret the input from our sensory organs by making a model of the world. When such a model is successful at explaining events, we tend to attribute to it, and to the elements and concepts that constitute it, the quality of reality or absolute truth. According to model-dependent realism, it is **pointless to ask whether a model is real, only whether it agrees with observation**. **If there are two models that both agree with observation then one cannot say that one is more real than another**" (Hawking & Mlodinow, 2010, cited in Guest et al. 2013:7).

With this in mind, the inference for qualitative data analysis is that the interpretation of the data becomes important. According to Guest et al. (2013:13), an inductive thematic analysis approach is probably the most appropriate for qualitative data analysis in this research. The process consists of reading through textual data, identifying themes in the data then interpreting the structure and content of the themes.

The focus of this study was to try and understand a perceived phenomenon. In order to arrive at a comprehensive understanding of this phenomenon, triangulation was employed. "Triangulation refers to the use of multiple methods or data sources in qualitative research to develop a comprehensive understanding of phenomena" (Patton, 1999, cited in Carter et al., 2014:545-547).

Two types of triangulation are employed here: Method triangulation and data source triangulation.

Method triangulation involves the use of different methods of collecting data. These could include interviews, observation and notes. Data source triangulation uses data from different types of people “to gain multiple perspectives and validation of the data” (Carter et al., 2014:545-547).

During the interview stage of data collection, semi-structured in-depth interviews were used (IDIs).

“Fontana and Frey (2000) described the IDI interview as one of the most powerful tools for gaining an understanding of human beings and exploring topics in depth. IDI interviews, ranging from the structured and controlled to the unstructured and fluid, can elicit rich information about personal experiences and perspectives (Russell, Gregory, Ploeg, DiCenso, & Guyatt, 2005). IDI interviews allow for spontaneity, flexibility, and responsiveness to individuals…” (cited in Carter et al., 2014:545-547).

The approach to data analysis for this study involved identifying themes, patterns and relationships in the data by employing techniques involving: primary and secondary data comparisons, searching for metaphors and analogues (Research Methodology, 2015).

A discourse analytical approach was used in that the attempt was to analyse the semi-structured interviews and the written text (Research Methodology, 2015).

The institutional documents were studied and compared to check for patterns and relationships. These were clustered under common descriptors in an attempt to locate them somewhere along the aesthetic-technical continuum.

Thematic analysis was also the approach used for the interview data analysis. As the semi-structured interviews were being conducted, certain keywords started emerging as the interview process continued. This was noted and as subsequent interviews were conducted, these keywords were referenced to test for emergent patterns and confirmation of suspected themes. The process was iterative until no new information became obvious.

The analysis of the interview data was done in stages. The first stage involved making notes during and after the interview to serve as potential points-of-departure for subsequent interviews or as potential recurring codes. The second stage involved reading the transcripts and sometimes listening to the recordings to re-familiarise myself with the content. The third stage involved re-reading where headings and broad categories were identified (open coding). Stage four was where the broad categories were reduced into main themes followed by stage 5 where similarities were identified and removed. The next stage involved checking the themes generated against the transcripts and ‘fine-tuning’ where necessary. The following stages involved checking the themes and codes generated against the transcripts and marking these in the transcripts. These were

then grouped under common theme headings and commentary offered on the interpretation (Burnard, 1991:461-466).

3.9 RELIABILITY, VALIDITY AND BIAS

Reliability measures the consistency and dependability of a construct meaning that if we take a measurement of a sample using some scale, we expect to get close to identical values each time if there are no causal changes to that which is producing the data. While with reliability, we expect consistency, this does not imply accuracy. Challenges to reliability might include the observer's subjectivity and also, in the case of surveys, interviews and questionnaires, the use of unclear and ambiguous questions. Yet another challenge is choosing or asking questions where the participants have no interest in the topic. Strategies that could reduce researcher bias would be questions not relying on observations but rather on responses, only employing questions that participants can answer and care about and reducing the ambiguity in questions (Bhattacherjee, 2012:56). These strategies were employed in developing the interview questions for the study and during the questioning.

Validity, or called construct validity, refers to how much correlation there is between that being measured and how representative it is of the underlying construct. Face validity, particularly, refers to the extent of perception of the reasonableness of the measure with respect to the underlying construct "on its face". For the type of questions that were asked, face validity appeared to be the appropriate approach to employ (Bhattacherjee, 2012:58).

3.10 DELINEATION OF THE RESEARCH

This study was limited to learners within the Multimedia Programme at CPUT and industry practitioners working in environments where multimedia practitioners were employed.

3.11 CONTRIBUTION OF THE RESEARCH

The aim of this research was to explore how it is that our learners have a perceived preference for 'Right- or Left- or Whole-Brained' engagement and to investigate a whole-brain paradigm for the training of multimedia practitioners. We hoped to arrive at declarative statements which purport to describe the nature of a holistic whole-brain instruction approach such that it may inform future curriculum development efforts and praxis.

3.12 ETHICAL CONSIDERATIONS

Ethics is defined by that which is considered acceptable behaviour and which supports important social and cultural values of a society. This behaviour may be communicated via the preferred medium by society who subscribe to them, which is then converted into rules (Castellano, 2004:98-114)

According to Bhattacherjee (2012:139-142), ethics is important "…because, science has often been manipulated in unethical ways by people and organizations to advance their private agenda and engaging in activities that are contrary to the norms of scientific conduct."

Particularly, when educators engage their own students as participants in their research, methodological and ethical problems required additional consideration since ethical concerns required addressing due to the fiduciary relationship between staff and their students, and violations of that relationship occur when the educator assumes a dual role as researcher with those students (Ferguson et al., 2004:56-58).

Since the researcher is the Programme Co-ordinator for the programme under study, it was possible that the participants might have felt that there was a need to respond in a particular way because of the fiduciary relationship between the researcher and participants. Though the researcher does not teach the students directly, it was of concern that participants might still experience pressure, regardless of whether the pressure is only perceived. It was understood that simply asking participants if they wish to volunteer might place them under pressure to comply (Bell & Nutt, 1999; Edwards & Chalmers, 2002; TCPS, 2003, cited in Ferguson et al., 2004:56-58).

To address this, the researcher invited participation in writing, anonymously, via an intermediary and also advised the participants about the following:

- Voluntary and harmless participation - Subjects in this research were made aware that their participation in the study was voluntary and that they have the freedom to withdraw from the study at any time with no consequence and that no harm would come to them
- Anonymity and confidentiality – Participants personal details will not be reported and they will not be identified in any way
- Informed consent: The participants were informed of the nature of the research and they can then decide if they agree to participate. The study will not proceed unless this is obtained

- Full disclosure – Full disclosure about the research and the context of the questions were provided ahead of time. The invitation letter and context of the questions are included in Appendix III

Other strategies that were employed included:

- Ensuring that the written transcripts or any direct quotations from transcripts do not contain personally identifiable information so as to not compromise the anonymity of the participants
- Another faculty researcher was sourced and requested for assistance to act as intermediaries to source the volunteers – The process was anonymous such that of the pool of students available for the study, only those agreeing to partake will be recruited by the assistant. Those not agreeing was not made known to the researcher. This way, students had an option to opt-out at the start without feeling the need comply (without the researcher's knowledge) – Students that choose not to participate would have been advised by the intermediary that their decisions will be kept confidential from the researcher. However, all students that were sourced by the intermediary voluntarily agreed to partake in the study and had no reservations about being involved once they were informed of the context and the types of questions that would be asked.

The questions were designed to gain insight into participants' perceptions. Participants were advised that there was no correct answer and that we simply seek to understand how they view and prefer to operate within the programme. Since I was dealing with people, particularly students, it was important to ensure that the environment was least threatening to them. Students were initially asked to sit where they feel comfortable and informal strategies involving asking them about their day and other non-academic matters were employed. An informal discussion using a light-hearted chat about various matters ensued often leading to discussions about family and other interests. These assisted in setting the tone for the interview. Interviewees had agency throughout the entire process and reminded that they could choose not to answer a question if they chose to.

The researcher agreed to comply with the ethical principles of the Faculty of Informatics and Design of CPUT as well to principals, acceptable approaches and strategies employed in social science research and that all data, results and recording thereof will be the researcher's own, unmanipulated work. Permission and consent were sought from Head of Department of the programme and supervisors of respective units.

The research also required the approval of the Cape Peninsula University's Ethics Committee. This was obtained (See Appendix IV).

3.12.1 VOLUNTARY PARTICIPATION AND INFORMED CONSENT

Participants for this research were sourced and requested to participate in a voluntary basis via an intermediary such that the researcher would not have knowledge of who chose not to participate. They were informed ahead of time what the purpose and nature of the study will be. They also had the option to withdraw at any point. An acknowledgement of their consent and that they volunteered for the study as well as that no identifiable information would be used in the research was recorded. Examples of the transcripts derived from the interviews are attached (Appendix V)

3.14 CONCLUSION

This chapter dealt with discussing the research approach and methodology that was employed for this study. The methods, paradigm, phenomenological standpoint and ontological basis for the data analysis were presented.

The chapter also described the data collection methods employed and qualitative data collection principles that underpinned them. Exploration of the institutional documents and the reason for this was discussed as these formed the basis for the evidence and the understanding of the curriculum engagement within CPUT.

This chapter and chapter 2 attempts to provide a platform and context for the data presentation and analysis chapter which follows.

CHAPTER 4: PRESENTATION AND ANALYSIS OF THE DATA

4.1 INTRODUCTION

The aim of this study, as stated earlier, is to understand why there is a perceived bias by students enrolled for the Multimedia Technology Programme towards either 'Design' or 'Technology' or in some cases why some learners appear to work equally well in both spaces.

In the previous chapter, the methodological approach in gathering the data was discussed. This chapter deals with the presentation and interpretation of the data.

Three sets of data are explored in this chapter: Institutional documents (course learner guides) with a view of understanding the topics covered; the educational landscape insofar as Multimedia instructional engagement is concerned elsewhere and textual data derived from interviews with learners, staff and industry practitioners.

The chapter begins by exploring the educational landscape with a view of understanding how Multimedia instructional engagement is carried out nationally and abroad and also where (in which faculties) they are placed to understand the focus of these programmes. The purpose of this is to understand how the term is interpreted because, based on this interpretation, it is assumed that the discourse within the academic engagement is informed by this interpretation. The results of this are tabulated in Appendix I. Then, institutional data is covered – examining the current dispensation of Multimedia training at CPUT. Samples of the Multimedia Learner Guides (or Subject Guides) are included in Appendix II.

The next section deals with attempting to understand the perceptions of the key players in the field. These include the students (interchangeably referred to as learners), staff responsible for teaching the students in the Multimedia programme and industry practitioners. The interrogation of these perceptions was enabled via semi-structured interviews that were transcribed. A sample of a student, staff and industry interview transcription is included in Appendix V.

4.2 THE DATA SET

Because the aim of this study was to attempt to understand why there appears to be a perceived bias towards some subjects over others and, potentially, a 'left-brained' or 'right-brained' or, in some cases, a 'whole-brained' engagement it was necessary to establish the context clearly. In chapter 1, the delineation and units of analysis were discussed. The problem environment and context places this research clearly in education, specifically, our academic engagement leading

to the practice of Multimedia students. The data sets that required interrogation were: Students' perceptions, Staff perceptions and Industry perceptions, curriculum documents as well as exploration of educational landscape to understand how Multimedia is taught and where it is positioned inside and outside of CPUT. These are represented graphically in Figure 4.1.

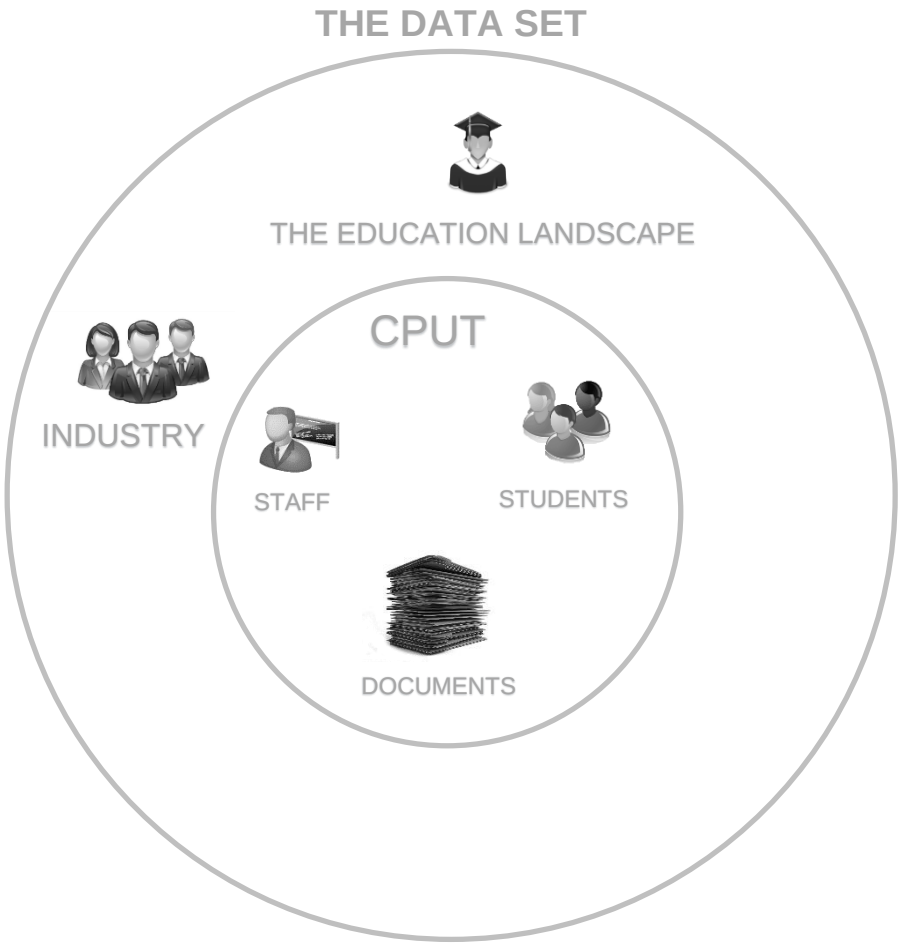


Figure 4.1: Graphic depicting the set of data investigated

(Source: Author's own construct)

We examine the institutional documents as these constitute a data set from which we attempt to draw a meaningful understanding of the discourse within the programme. Flick (2009:257) suggests that"…documents are not just a simple representation of facts or reality. Someone (or an institution) produces them for some (practical) purpose and for some form of use (which also includes a definition of who is meant to have access to them). When you decide to use documents

in your study, you should always see them as a means for communication." The learner guides (curriculum or subject guide is thus important in this study as we try to understand the focus of the Multimedia programme at CPUT. It is also used to reference or benchmark against other programmes that deal with similar or similarly-named programmes.

Flick (2009:261) also says "…that in analysing the documents, one should consider who the authors are and why the documents were produced and what the contexts of use of the documents are."

The learner guides, produced by the lecturers are the formal instructional guides for learners and are derived from the HEQC approved curriculum, thus, these documents have veracity with respect to this study and in referencing other programmes (also approved by the HEQC). It should be noted that while the learner guide details the topics covered and expected outcomes, amongst other things, it cannot reflect what transpires in the actual classroom, interactions with the facilitator and other learning dynamics unfolding in the interaction in the class. In this study, the learner guides are interrogated purely to understand the nature of the topics and how they relate to the study in terms of the emphasis on either design- or technology-type topics.

The wider audit of the education landscape serves as a baseline or benchmarking of our (CPUT's) and other local offerings. From the landscape exercise, it is hoped that we improve our comprehension of how international discourses in Multimedia engagement present.

The last set of data; the interviews, serve as aids to understand the lived experiences and perceptions of the key players: The learners, the staff teaching Multimedia, and the industry that employs our graduates. By understanding their perceptions and by analysing the data we attempt to use this understanding along with the other data sets to arrive at declarative statements towards whole-brain training at CPUT.

The study centred around our attempting to try and understand a perceived phenomenon which is the preferences of students. In order to arrive at a comprehensive understanding of this phenomenon, triangulation was employed. "Triangulation refers to the use of multiple methods or data sources in qualitative research to develop a comprehensive understanding of phenomena (Patton, 1999, cited in Carter et al., 2014:545-547).

Two types of triangulation are employed here: Method triangulation and data source triangulation. Method triangulation involves the use of different methods of collecting data. These could include

interviews, observation and notes. Data source triangulation uses data from different types of people "to gain multiple perspectives and validation of the data" (Carter et al., 2014:545-547).

During the interview stage of data collection, semi-structured in-depth interviews were used (IDIs). “Fontana and Frey (2000) described the IDI interview as one of the most powerful tools for gaining an understanding of human beings and exploring topics in depth. IDI interviews, ranging from the structured and controlled to the unstructured and fluid, can elicit rich information about personal experiences and perspectives (Russell, Gregory, Ploeg, DiCenso, & Guyatt, 2005). IDI interviews allow for spontaneity, flexibility, and responsiveness to individuals…” (cited in Carter et al.,2014:545-547).

4.3 THE EDUCATIONAL LANDSCAPE

As mentioned in the previous chapter 1, Multimedia-type offerings at eleven institutions in South Africa and twelve international programmes were investigated to determine:

Locality: Which faculty or school they are located in,

Naming: What the qualification is called,

The duration of the programme: The duration of the offering,

Career options: Typically what types of jobs graduates would potentially get

Entrance requirements: What made students eligible to study there

Learning outcomes and subject offerings: This aids us in understanding whether there is some fair overlap with what we do at CPUT or whether there are vast discrepancies

Career opportunities: Possible career options were also explored.

The findings and their sources are tabulated in Appendix I.

An extract from the comprehensive tabulation in Appendix I is shown below in Table 4.1. Here only the institution’s name, it’s location, which faculty and department the programme is located in and what the name of the qualification is, is shown. This begins to give the reader a sense of how diverse the offerings are and how the interpretation of Multimedia varies. An attempt is made to understand how the term, and thus the discourse in the curriculum, is interpreted.

Table 4.1: Extract of the education sector scan

	Institution	Location	Faculty/Department	Qualification Name
1	Tshwane University of Technology (TUT)	South Africa Pretoria	Faculty of The Arts Department of Visual Communication	National Diploma: Multimedia: Visual Arts-Biased
2	Tshwane University of Technology (TUT)	South Africa Pretoria	Faculty of Information and Communication Technology Department of Computer Science	National Diploma: Information Technology: Multimedia
3	Tshwane University of Technology (TUT)	South Africa Pretoria	Faculty of Information and Communication Technology Department of Computer Science	National Diploma: Information Technology: Web and Application Development
4	University of Johannesburg	South Africa Johannesburg	Faculty of Art, Design and Architecture Department of Multimedia	National Diploma: Multimedia
5	University of Johannesburg	South Africa Johannesburg	Faculty of Art, Design and Architecture Department of Multimedia	BA Design in Digital Media
6	University of South Africa	South Africa Johannesburg	College of Human Sciences School of Arts Department of Art History, Visual Arts and Musicology Multimedia Studies	Bachelor of Arts (Culture and Arts) Multimedia Studies: Audiovisual Multimedia
7	University of South Africa	Distance education institution South Africa	College of Human Sciences School of Arts	Bachelor of Arts (Culture and Arts) Multimedia Studies: Computer-Generated

		Pretoria	Department of Art History, Visual Arts and Musicology Multimedia Studies	Multimedia
8	University of South Africa	Distance education institution South Africa Pretoria	College of Human Sciences School of Arts Department of Art History, Visual Arts and Musicology Multimedia Studies	Bachelor of Arts (Culture and Arts) Multimedia Studies: Multimedia in Digital Visual Arts
9	University of South Africa	Distance education institution South Africa Pretoria	College of Human Sciences School of Arts Department of Art History, Visual Arts and Musicology Multimedia Studies	Bachelor of Arts (Culture and Arts) Multimedia Studies: Visual Multimedia
10	University of Cape Town	South Africa Cape Town	The Centre for Film and Media Studies	BA in Film and Media Production: Digital Media and Informatics Stream
11	City Varsity School of media and creative arts	South Africa Cape Town	Private Institution	Diploma / Advanced Diploma in Multimedia Design And Production
International				
12	The Hague University of Applied Sciences	Netherlands The Hague	Academy of ICT & Media	Bachelor Degree: Communication & Multimedia Design
13	The Hague University of Applied Sciences	Netherlands The Hague	Academy of ICT & Media	Bachelor Degree: Communication & Multimedia Design - User Experience
14	Saxion University of	Netherlands Enschede	The School of Creative Technology	Bachelor of Science Bachelor in Art & Technology

	Applied Sciences			
15	University of Greenwich	United Kingdom Greenwich	Science Department of Computing & Information Systems	Creative Digital Media, BSc Hons
16	University of Greenwich	United Kingdom Greenwich	Science Department of Computing & Information Systems	Digital Media Technologies, BSc Hons
17	University of Greenwich	United Kingdom Greenwich	Science Department of Computing & Information Systems	Games Design and Development, BSc Hons
18	University of Greenwich	United Kingdom Greenwich	Science Department of Computing & Information Systems	Web Technologies, BSc Hons
19	University of Greenwich	United Kingdom Greenwich	Bachelor of Arts Department of Creative Professions & Digital Arts	Digital Arts Practice, BA Hons
20	Brunel University, London	United Kingdom Middlesex	Department of Electronic and Computer Engineering	Digital Design BSc
21	University of Kent	United Kingdom Kent	School of Engineering and Digital Arts	Multimedia Technology and Design - BSc (Hons)
22	Queen Mary University of London	United Kingdom London	School of Electronic Engineering and Computer Science	BSc (Engineering) (Hons) Multimedia and Arts Technology
23	Queen Mary University of London	United Kingdom London	School of Electronic Engineering and Computer Science	BSc (Hons) Computer Science and Multimedia

What is evident from the table is that the interpretation of what Multimedia is and thus how it is presented varies. The offerings are also located across a span of faculties and departments and even the subject names vary and, when interrogating the outcomes of the programmes it appears as if there is a perceptible bias. It is challenging to exactly quantify the trend in where the programmes are located due to the diverse nature of the naming conventions used by the various institutions. A larger sample would be required to more clearly understand whether there is a generic bias in terms of the perception of what Multimedia is and where to locate the discipline.

Table 4.2 below is presented to merely indicate the variance in offerings and in which discipline they reside and is suggestive of a possible continuum of potential offerings.

Table 4.2: Number of programmes located per discipline

Number of Programmes Located Per Discipline					
ICT/Computer Science	Arts	Art and Technology	Engineering and Computer Science	Engineering and Digital Arts	ICT and Media
7	9	1	3	1	2

It seems, then, that some institutions offer the programme with a perceptible bias towards technology, science, computer science or engineering while others have a more visual arts bias. It seems, too, that it may also be located somewhere between the extremes. Indeed, some institutions offer variations of Multimedia to expose learners to different potential focus areas

For example, The University of Greenwich offers five media-related courses housed in two disciplines. These are:

Department: Computing & Information Systems

Creative Digital Media, BSc Hons

Digital Media Technologies, BSc Hons

Games Design and Development, BSc Hons

Web Technologies, BSc Hons

Department: Creative Professions & Digital Arts

Digital Arts Practice, BA Hons

Media and Communication, BA Hons

Another example is Tshwane University of Technology

Faculty of Information and Communication Technology, Department of Computer Science

National Diploma: Information Technology: Multimedia

National Diploma: Information Technology: Web and Application Development

Faculty of The Arts, Department of Visual Communication

National Diploma: Multimedia: Visual Arts-Biased

As mentioned in Chapter 1, what these findings potentially suggest is that Multimedia as a discipline appears to be established by many universities locally and abroad. It seems, though, that there isn't any single place where it is considered to fit snugly. Rather, there appears to be a continuum of along which an institution will locate its offering. This would range from highly technical in nature to highly aesthetic and visual arts-based.

Multimedia as an academic offering appears to be located along a continuum as discussed above. Where it is located on that continuum is also suggestive of the groupings of course/module offerings. Certain topics, skills and other proficiencies appear to be grouped in a certain way depending on where they are located.

Why then is all of the above of interest to us in developing and improving our curriculum at CPUT?

4.3.1 ENTRANCE REQUIREMENTS, ADMISSION AND FOCUS

By exploring what criteria are used to select and admit students into a particular flavour of multimedia, we may gain an understanding of what proficiencies and skills are deemed required to succeed in the programme. This is helpful because it helps us to understand where the particular offering is tailored to fit across the spectrum of multimedia offerings available nationally and internationally.

4.3.1.1 Minimum admission requirements at CPUT

In order to gain entrance into CPUT, the following admission requirements are stipulated:

A National Senior Certificate (NSC), as certified by Umalusi, with an achievement rating of 3 (moderate achievement: 40 – 49%) or better in four recognised NSC 20-credit subjects,

and an achievement rating of 2 for Mathematics or Mathematical Literacy, and an achievement rating of 3 in the required official language at Home Language level, and an achievement rating of 2 in the other required language on at least First Additional Language level; one of these languages shall be English or Afrikaans (Cape Peninsula University of Technology, n.d.).

4.3.1.2 Specific programme requirements for Multimedia at CPUT

In order to be accepted into the Multimedia Programme the following minimum requirements must be met:

Required Senior Certificate subjects:

Home Language 4 (50% – 59%)

First Additional Language 3 (40% – 49%) (English or Afrikaans)

Mathematics 3 (40% – 49%)

Maths Literacy 5 (60% – 69%)

4.3.1.3 The varying focus of programmes at some institutions

Appendix I details the admission and selection criteria for the various programmes at different institutions. It also conveys what the subject and topic areas are for these particular programmes Earlier in this chapter we examined where (in which faculty and department) a programme was located in an attempt to understand the focus of the programme. As mentioned, selection and admission appear to be guided by where the programme is located. Emphasis and Mathematics and Languages if largely technically based and Languages and a creative portfolio if the programme has a strong visual arts base.

Appendix I attempts to present a comprehensive view of the educational landscape insofar as the Multimedia offerings are concerned by examining the offerings of 24 different offerings. If we simply extracted a few from this list we may arrive at a better sense of the degree of variation in the interpretation of what Multimedia is and, indeed, how the training should be curriculated.

Table 4.3 below is a short extract from the complete listing in Appendix I

Table 4.3: Sample of Multimedia offerings at various institutions

	Institution	Faculty/Department	Qualification	Year	Admission, Selection Criteria, Programme Outcomes and Subjects
1	CPUT	Informatics and Design: Department of Information and Communication Technology	National Diploma Multimedia Technology		Description: Multimedia technology is a career-focused ICT specialisation course that enables students who achieve the qualification to, with some supervision and as part of a general team and individually, engage in a process where a static, dynamic and interactive multimedia presentation (either web-based, dedicated console application, media-specific such as CDROM or DVD or portable technology, audio or video) will be conceptualised, designed, planned, developed and published or produced The practictioner: Plans, designs and develops the production of digitally delivered information, promotional content, instructional material and entertainment through online and recorded digital media using static and animated information, text, pictures, video and sound to produce information and entertainment tailored to an intended audience and purpose. Web and multimedia development professionals combine design and technical knowledge to research, analyze, evaluate, design, programme and modify websites, and applications that draw together text, graphics, animations, imaging, audio and video displays, and other interactive media. Tasks include: Analyzing, designing and developing Internet sites applying a mixture of artistry and creativity with software programming and scripting languages and interfacing with operating environments

					Assisting in analyzing, specifying and developing Internet strategies, web-based methodologies and development plans Communicating with network specialists regarding web-related issues, such as security and hosting web sites, to control and enforce Internet and web server security, space allocation, user access, business continuity, web site backup and disaster recovery planning Designing and developing digital animations, imaging, presentations, games, audio and video clips, and internet applications using multimedia software, tools and utilities, interactive graphics and programming languages Designing, developing and integrating computer code with other specialised inputs, such as image files, audio files and scripting languages, to produce, maintain and support web sites They also create and manipulates computer animation, audio, video and graphic image files into multimedia programs to produce data and content for information kiosks, multimedia presentations, web sites, mobile telephone resources, electronic gaming environments, e-commerce and e-security solutions, and entertainment and education products. The practitioner also plans, produces and maintains web sites using web programming languages, software applications, technologies and databases together with specifications of user needs, often in conjunction with other ICT professionals such as business analysts, web designers and network and usability specialists. Entrance requirements: At CPUT, candidates for the Multimedia programme are selected based on their Grade 12 scores and a minimum points system. Specifically:

					Minimum admission requirements: A National Senior Certificate (NSC), as certified by Umalusi, with an achievement rating of 3 (moderate achievement: 40 – 49%) or better in four recognised NSC 20-credit subjects, and an achievement rating of 2 for Mathematics or Mathematical Literacy, and an achievement rating of 3 in the required official language at Home Language level, and an achievement rating of 2 in the other required language on at least First Additional Language level; one of these languages shall be English or Afrikaans. Specific programme requirements Required Senior Certificate subjects: Home Language 4 (50% – 59%), First Additional Language 3 (40% – 49%), (English or Afrikaans), Mathematics 3 (40% – 49%), Maths Literacy 5 (60% – 69%) (get reference off CPUT site) Duration: 3 years Career options: Html Coder / Developer, Internet Developer, Web Editor / Designer, Web Programmer Web Publishing Advisor, Website Architect, Website Developer, Digital Media Designer Instructional Designer, Interactive Media Designer, Multimedia Artist, Web Designer Multimedia Designer, Computer Games Programmer, Digital Media Specialist, Graphical Programmer, Multimedia Developer, Multimedia Programmer, Web Developer, Html Coder / Developer, Internet Developer, Web Editor / Designer, Web Programmer, Web Publishing Advisor, Website Architect, Website Developer, Data Administrator, Database Administrator, Multimedia Technician, Web Editor, Webmaster, Website Administrator, Website TechnicianSound Editor / Mixer / Recordist / Operator / Specialist, Sound Recording/Capturing adn Editing and Mastering, Video Production and Editing and Exporting

					Because of the entrepreneurship module introduced in the final year, a number of students work freelance or have founded their own companies.
				1	Applications Development Foundations 1 Business Practice 1 Communications Networks Foundations 1 ICT Fundamentals 1 Multimedia Foundations 1 Professional Communications 1 Programming 1 Project 1
				2	Applications Development Fundamentals 2 Communication Networks Fundamentals 2 ICT Electives 2 Information Management 2 Multimedia Applications Fundamentals 2 Multimedia Design 2 Multimedia Practice 2 Multimedia Technology 2 Professional Communications 2 Project 2
				3	ICT Electives 3 Multimedia Design 3 Multimedia Practice 3 Multimedia Technology 3 Professional Practice 3 Project 3

					Project Management 3 Project Presentation 3
2	Tshwane University of Technology (TUT)	Faculty of Information and Communication Technology Department of Computer Science	National Diploma: Information Technology: Web and Application Development		National Senior Certificate (NSC) with a minimum of 40% in the language of learning and teaching of the higher education institution. Admission requirement(s): A National Senior Certificate with an endorsement of a bachelor's degree or a diploma or an equivalent qualification, with an achievement level of at least 3 for English (home language or first additional language) and 4 for Mathematics. Applicants with a 3 for Mathematics or at least 5 for Mathematical Literacy will be considered for admission to the extended programme. Programme outcomes: The purpose of this qualification is to equip students with the necessary skills to pursue careers in IT by creating, building, maintaining and managing web solutions. On completion of this qualification, students should be able to apply - • modern analytical and design techniques and methodologies in the development of IT software systems; • user-interface design principles; and • the appropriate software programming language and development environments to implement designed Internet solutions. This qualification focuses on website design and administration, and Internet programming by using various scripting languages and GUI programming environments.
				1	Computing Fundamentals Computing Systems Computing Skills Development Software
				2	Graphical User-Interface Design I Information Systems II

					Internet Programming II Technical Programming I Web Management II
				3	Industry Exposure III Internet Programming II I Web Management III
3	University of South Africa	College of Human Sciences School of Arts Department of Art History, Visual Arts and Musicology Multimedia Studies	Bachelor of Arts (Culture and Arts) Multimedia Studies: Audiovisual Multimedia		A National Senior Certificate (NSC) (Degree endorsement) with at least 50% in the language of teaching and learning, or A Senior Certificate (SC) with matriculation exemption or qualify for the exemption from the Matriculation Board with at least a D symbol on HG or a C symbol on SG in the language of teaching and learning. Permission letter from the Department of Art History, Visual Arts and Musicology is required. Prospective students are required to submit a portfolio of artworks consisting of 4 drawings and 4 paintings or photographic/digital documentation thereof together with a completed questionnaire and record of personal details.
				1	Visual Literacy Introduction to Art History Fundamentals of Communication Computer Systems: Fundamental Concepts End-User Computing (Practical) Form and Motion Music and Society Two Dimensional Imaging Options (maximum 2) English Studies: Approaching Literature and Writing English Studies: Explorations in Reading and Meaning

					Visual Programming 1
				2	Integrated Organisational Communication Music Technology 1: Midi Visual Programming II Musical Entrepreneurship Writing Skills for the Communication Industry Visual Arts 1 Visual Arts 2
				3	New media technology Music Technology 2: Digital Audio Music in South Africa Sociology of Music Professional Multimedia Practice Visual Arts 3 Optional subjects (max 1) Media Studies: Content, Audiences and Production Exploring Information User Studies Investigating Information Ethics in the Information Era The Political Economy of Information
11	City Varsity School of media and creative arts	Accredited private Institution			DIPLOMA IN MULTIMEDIA DESIGN AND PRODUCTION (2 years)
					The two-year Diploma Course in Multimedia Design involves work in many areas of graphic and new media design and equips students to become accomplished in the design and production of print media, web design and interactive media design. An optional and advanced third year affords the opportunity to pursue an Advanced Diploma

					in Multimedia where students gain industry experience, work in a simulated creative agency and specialize in either digital design for print and interactive media or web application development for desktop monitors and hand-held/mobile devices ADVANCED DIPLOMA IN MULTIMEDIA DESIGN AND PRODUCTION (1 year) An optional third year affords the opportunity to pursue an Advanced Diploma in Multimedia Design and Production specializing in advanced level Digital Design for print, web and interactive media for desktop, tablet and mobile devices. Students will develop a conceptual approach to working with an advertising brief and will experience a design environment similar to that of an agency. Students will gain knowledge of branding, art direction, client service and interactive design during the course.
				1	During the first year of the Multimedia Design course, students are given a strong foundation in the principles of design. The emphasis is on paper-based design training to establish the skills required to translate a design brief into an effective piece of visual communication. Subjects throughout the year are: Graphic Design 1 Illustration 1 Digital Design 1 Contextual Studies 1 - Media Studies and Visual Literacy
				2	During the second year, students hone their creative skills and produce projects that will form the basis of their digital CV and portfolio. Students work on interdepartmental projects learning to work with their colleagues as clients and also work on real industry projects where applicable. As part of the requirement for the completion of the course, students spend two weeks in an agency/studio environment. The time allocated for this

					falls within the vacation periods and students find their own unpaid placement in a workplace of their choice. Subjects throughout the year are: Graphic Design 2 Digital Design 2 Scripting for the Web 1 Contextual Studies – Visual Literacy 2, Media Law, Sound for MultiMedia, and Internship
				3	Projects undertaken during the third year of the Diploma course are of a recognized professional industry standard and where ever possible, incorporate real-world working experience. The year covers: Graphic Design 3 Digital Design3 Contextual Studies 3 Electives Web and Mobile App Development Interactive Media

What is evident from Table 4.3 is that the subject offerings and the course outcomes vary from one institution to another and even within the same institution depending on what the focus is. All of the programmes explored had some element of Media or Multimedia inherent in their naming but the focus, while some overlap exists between them, is different.

4.4 CPUT'S MULTIMEDIA PROGRAMME REVISITED

As discussed in Chapter 1, the Multimedia programme at CPUT is a hybrid programme that requires learners to perform adequately in various subjects. These subjects include, broadly, concepts that related to computer programming and technology but they are also expected to perform in media and design-related subjects. The skills required for the technology and programming as well as the design-related subjects require students to possess some skill in idea generation, the ability to problem-solve, creativity, visual aesthetic appreciation and design, sequential and logical thinking, analytical thinking and also other skills that relate to how they interact in groups, presentation skills as well as personal and time management. The ultimate aim of the programme is to develop learners holistically so that there is at least a fair level of performance across these subjects and their topics.

Learners are exposed to a number of subjects as shall be detailed below but the focus of this study is to examine the Design, Technology, Practice and Project 2 and Project 3 subjects as these relate directly to focus of this study.

The Multimedia Programme is located within the Department of Information Technology within the Faculty of Informatics and Design. The entrance requirements into the programme have already been explored earlier. The qualification is called: ND: Information & Communication Technology: Multimedia Technology. Once entering into the programme, all students within the department take the same subjects. All students are exposed to the same subjects in the first year. After completing the first year, students may then proceed into one of three streams: Application Development, Communications Networks or Multimedia technology. Entrance into the second year of Multimedia is subject to students passing Multimedia Foundations I with at least 60% and they are also required to submit a portfolio that showcases their skill and ability.

The subjects that students are expected to cover is shown below. (Cape Peninsula University of Technology, n.d) (The outcomes are contained in the comprehensive learner guides in Appendix II.

Table 4.4: Subject listing for Multimedia leaners

	Level 1- All subjects are compulsory
Subject Code	**Subject Name**
ADF152S	Applications Development Foundations 1
BPR152S	Business Practice 1
CNF152S	Communications Networks Foundations 1
ICF152S	ICT Fundamentals 1
MUF152S	Multimedia Foundations 1
PRC152S	Professional Communications 1
PRG152S	Programming 1
PRT152S	Project 1
	Level 2 – All subjects are compulsory
ADF260S	Applications Development Fundamentals 2
CNF260S	Communication Networks Fundamentals 2
ICE260S	ICT Electives 2
INM260S	Information Management 2
MAF260S	Multimedia Applications Fundamentals 2
MUD260S	Multimedia Design 2
MUP260S	Multimedia Practice 2
MUT260S	Multimedia Technology 2
PRC260S	Professional Communications 2
PRT260S	Project 2
	Level 3 – All subjects are compulsory
ICE360S	ICT Electives 3
MUD360S	Multimedia Design 3
MUP370S	Multimedia Practice 3
MUT370S	Multimedia Technology 3
PFP360S	Professional Practice 3
PRT360S	Project 3
PRM370S	Project Management 3
PRP370S	Project Presentation 3

The curriculum map for the entire ICT programme is shown below and the Multimedia stream is highlighted to show how it fits alongside the other streams

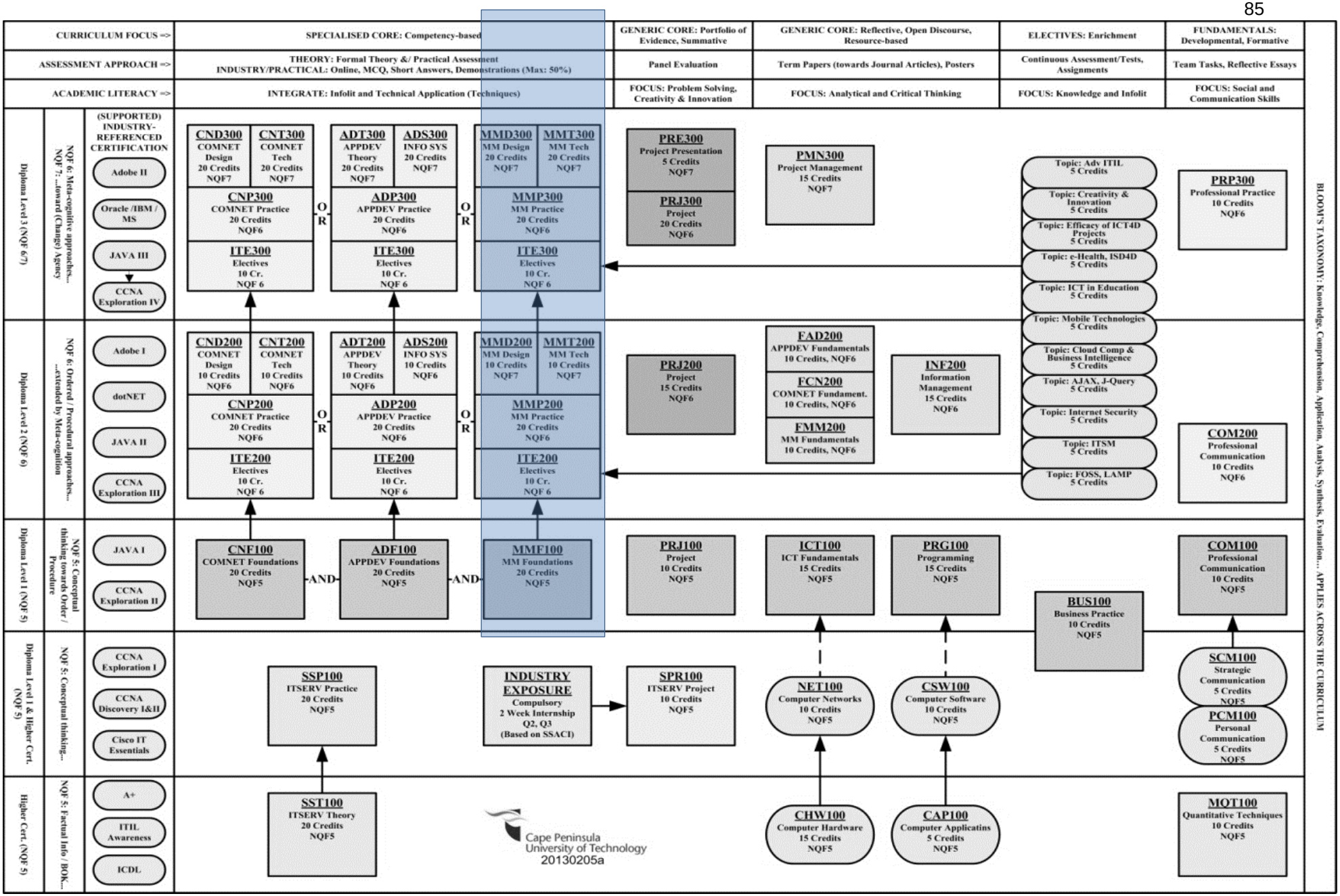


Figure 4.2: Curriculum map for the entire ICT programme at CPUT (Alexander, 2012:9)

Only the subjects and topics relevant to Multimedia are discussed below. Only topics that are covered in these subjects have been extracted from the complete learner guide and are tabulated below. A sample of the Multimedia Programme Learner Guides are included in Appendix II

4.4.1 MULTIMEDIA FOUNDATIONS: MUF152S

"The Multimedia Foundations 1 module provides an introduction to the various aspects of the multimedia field and industry. The module aims to inform the student on theoretical aspects as well as the practical implementation of each component and provide students with the ability to create evidence, including a brand pack, public service announcement video and website" (Cape Peninsula University of Technology, 2018).

Table 4.5: Multimedia Foundations topic list

THEME/TOPIC	SPECIFIC OUTCOMES
Introduction to Multimedia Introduction to Visual Literacy	Define multimedia and discuss web-based categories. Discover career opportunities in the multimedia domain. Define visual literacy and understand its significance in multimedia. Understand and analyse the subject matter and interpret the meaning of images.
Multimedia Elements: Typography	Learn about different font classifications and styles. Understand why it is important to use different fonts in different mediums. Analyse how different fonts create emotions toward the content and layout.
Multimedia Elements: Graphics | Colour | Composition	Understand the concepts and laws regarding copyright. Understanding the different colour models: RGB, CMYK, and HSB. Recognise colour theory terms and concepts. Understand the difference between painting and drawing programs. Identify different file types and analyse which graphic file types are used in various instances. Understanding how composition of photographs and materials communicate.
Introduction to Branding & Design	Understand the basic various principles of branding and graphic design.
Branding & Design	Discuss the differences and similarities between print and digital design. Understand the importance of adjusting the font size, spacing, colour, line length, and alignment of text.
	Apply the principles of design and layout for print by creating a poster/flyer/newsletter. Apply the principles of digital design and layout by creating a webpage/digital newsletter/
Storytelling: Video	Discover the principles of storytelling. Learn about the traditional three-act structure. Learn how to apply storytelling and the three-act structure. Create a script.
Storytelling: Video	Discover the principles of storytelling. Learn about the traditional three-act structure. Learn how to apply storytelling and the three-act structure. Create a script.
	Discover what a storyboard is and how it relates to the storytelling and video production process. Create a storyboard based on the script.
Storytelling: Video	Discover the video production processes. Learn how to apply the planning documents for each video production process in order to create a video.
	Edit the video content; add sound, animation, graphics and typography to the production.
Website Planning and Structural Design	Understand design strategy. Define and create planning documents.
	Understand and implement organisational structures within planning.
Web Design and Strategy: Concepts of UI & UX	Investigate and understand concepts of website navigational structures. Produce a persona based on the provided target market case study.

Web Design and Strategy: Concepts of UI & UX	Understand design guidelines for appearance and interactivity. Create wireframes, storyboards and site planning documents.
Web Design and Development: HTML5 & CSS3	Apply the rules and concepts of usability to create a fully functional professional portfolio website.

4.4.2 MULTIMEDIA APPLICATION FUNDAMENTALS 2: MAF260S

"The purpose of this subject is to analyse and engage in critical thinking involving design in digital space. The design concepts presented in this subject are centred around principles that cover the vast knowledge base of UX (User experience and UI (User interface) design. Throughout the year, topics that range from general colour theory, accessibility and universal principles of design will be covered. The bulk of the subject is theory but seminar-style discussions during in-class practicals will also take place. The goal is for student to understand the concepts and design implementation of UX and UI principles and to be able to apply them regardless of academic stream specialisation" (Cape Peninsula University of Technology, 2018).

Table 4.6: Multimedia Applications Fundamentals topic list

Introduction: Fundamentals and Application of Design Principles in a Digital Environment
INTRODUCTION TO THE BASIC DESIGN PRINCIPLES
Colour and Typography
Iconography and Accessibility
Cross platform design styles
INTRODUCTION TO UNIVERSAL PRINCIPLES OF DESIGN (UPD)
Universal Principles of Design 1 - 10
Introduction to UX (User Experience)
INTRODUCTION TO UX (overview)
Wireframing and Prototyping
Implementation of layout for websites and applications: Effectiveness of UX
Universal Principles of Design 11 - 21
Application of UX (User Experience) and UI (User Interface) design
INTRODUCTION TO UX and UI development (overview)
Wireframing and Prototyping: Tools and their use in industry
Good UX versus Bad UX: A practical study
Checklists of Criteria for UX and UI
Lean UX design
UI design implementation for multiple platforms: A Practical exploration
Universal Principles of Design 21 – 30
Social Media and UX
Social Media and User Experience
Social Media Networks: An overview of demographic and usage
Social Media: Evolution of User experience
Crowdfunding and Viral Marketing: Advantages and disadvantages of UX and UI
Universal Principles of Design 31 - 36

4.4.3 MULTIMEDIA DESIGN 2: MUD260S

"Multimedia Design 2 attempts to provide a strong introduction to the basics of graphic design principles and techniques to enhance your overall ability to design aesthetically pleasing multimedia interfaces and artefacts.

During the year your abilities to engage and communicate the conceptualisation of your designs will be developed. The subject discussions will also provide more detailed theoretical and practical exposure to logo, web and brand design approaches including the introduction of user interface and experience" (Cape Peninsula University of Technology, 2018).

Table 4.7: Multimedia Design 2 topic list

THEME/TOPIC	SPECIFIC OUTCOMES
Introduction to Multimedia Design	Discuss the functions of design in a theoretical context. Review the structures expected to be present throughout the year. Students to revisit lessons from the first year in preparation for the first term.
Basic Design Principles	Introduce the foundations of graphic design. Explore illustrating and idea conceptualisation. Start sketching, scamping and storyboarding in a visual diary. Understanding design and layout.
Using Colour in Graphic Design	Discuss the use of colour in graphic design. Explore colour in digital vs. print. Investigate illustrating and idea conceptualisation. Start sketching, scamping and storyboarding in a visual diary.
Digital vs. Print Design	Explore the principles of digital and print design.
Layout & Design	Understanding layout and design, applying the principles of design. Self-study assignments.
Typography	Take an in-depth look at typography and examine its use as a design tool in print and digital. Create typographic poster for print. Create a typography dominant HTML newsletter.
Logo and Icon Design	Conceptualise a logo and icon design. Produce a logo and icon design for print and digital use.
Branding and Identity	Investigate the principles of branding and corporate identity design. Discuss emotive branding and creating brand relationships. Discuss the evolution of branding.
Branding and Identity	Investigate the principles of branding and corporate identity design. Discuss emotive branding and creating brand relationships. Discuss the evolution of branding.
Marketing Material Design	Identify the different types of basic marketing material. Apply the digital and print design principles as well as the typography, logo and icon design skills to create print and digital marketing material.
Brand Strategy	Examine the principles of brand strategy and define the key elements to creating unique brand identities. Create a personal brand strategy.
Creating a Personal Brand	Define and create your personal brand that represents you as a Multimedia Specialist. Branding includes a brand strategy, logo, business card, newsletter layout, email signatures, etc.

4.4.4 MULTIMEDIA PRACTICE 2: MUP260S

“Welcome to the 2nd year of the Diploma in Information and Communication Technology. Multimedia Practice II is a major for Multimedia students.

The purpose of this subject is to analyse, conceptualise and produce narrative orientated design projects. Critical thinking and design implementation will centre on concepts and principles of narrative design, Artistic interpretation and creative direction” (Cape Peninsula University of Technology, 2018).

Table 4.8: Multimedia Practice 2 topic list

Introduction to narrative editing in a digital environment
Narrative design through image manipulation Retouching and digital image conceptualisation Production tools workflow and output Image manipulation for production and post-production
Introduction to audio production: A theoretical and practical approach
INTRODUCTION TO AUDIO (overview) Audio Theory: the science of sound Audio conceptualisation for production Implementation of audio in a production studio environment
Pre-production and post-production: Insight into the environment of motion
INTRODUCTION TO MOTION DESIGN (overview) Motion graphics and compositing Workflow of a production pipeline Principle of typography in motion Infographics and data visualisation
Creative direction and the production process
Creative direction and the production process Pre-production and script creation Vector design in a digital environment Pre-production and the storyboard process

4.4.5 MULTIMEDIA TECHNOLOGY 2: MUT260S

“Multimedia Technology 2 will provide you with technology theory and practice to complement your Multimedia skills. Tools and techniques will be introduced that will develop enhance your overall abilities…During the year your abilities to design, implement and debug software products will be assessed…On successful completion of this subject, you will be able to:

Design, construct and debug JavaScript applications. Specifically, your skills will be developed to successfully incorporate HTML5 CSS3 and JQuery code.

Comprehend and debug typically programming constructs these include variables, loops, and functions. Object-oriented programming techniques will be emphasised" (Cape Peninsula University of Technology, 2018).

Table 4.9: Multimedia Technology 2 topic list

Introduction to Internet Programming
Loading of scripts and style sheets
Review of HTML5
Visual Studio Code
JavaScript data types
Browser aids
JavaScript loops
Conditionals statements
Functions
Objects
HTML5 and JavaScript interaction
CSS functionality
Debugging scripts
Using Boolean flags
Intermediate Web Programming Techniques
Combining Html forms with JavaScript
Handling user inputs
JavaScript Timing functions
Random number generation
Script debugging
Introducing Typescript
Arrow functions
Asynchronous vs Synchronous code
Object oriented JavaScript class
Typical JavaScript Game Structure.
Introducing Bootstrap
Intermediate CSS3 techniques
Handling project code
Content Management Systems
Introduction to WordPress
Familiarization with the WordPress Database WordPress local installation
WordPress configuration and customization
Working with themes

Customizing WordPress themes
Compare and contrast alternate CMS
Evaluation of different themes
Implement custom JavaScript in WordPress.
Implement custom JavaScript in WordPress.
CSS3 Techniques
Responsive page design using Bootstrap
CSS Layouts using flex and grid
CSS Modal design
Simple Rest API Calls.
Responsive page design using Bootstrap
CSS Layouts using flex and grid
CSS Modal design
Simple Rest API Calls
Basic Internet Server Configuration
Domain registration, Producing live sites
Internet protocols and service providers
Highlight security issues.
Understand the issues around publishing code

4.4.6 MULTIMEDIA DESIGN 3: MUD360S

“The Multimedia Design 3 module provides a more in-depth investigation into the various aspects of the multimedia field and aims to prepare students for the working world. The module includes a basic introduction into the soft SEO practices and how it affects the design and implementation processes. Building on the skills gained in the second-year level, students are required to apply their design knowledge to create high-level projects as well as a professional brand and digital and print-ready portfolios that accurately showcase their skills in their chosen field. In addition, students will also be required to understand how to market themselves using online marketing and social networking platforms…The Multimedia Design 3 module provides students with an

introduction into website management and metrics while refining brand development and digital marketing skills with a keen focus on their professional portfolios” (Cape Peninsula University of Technology, 2018).

Table 4.10: Multimedia Design 3 topic list

THEME/TOPIC	SPECIFIC OUTCOMES
Round-up of MUD260S	Reflection on the previous year's work and the portfolio created at the end of year two. Discuss ways to fine-tune or redesign their branding. Create a database of artefacts for the portfolio.
Branding: Creating A Sustainable and Living Brand	Revisit the brand development process and understand its longevity and growth. Interrogate their brand's core identity and how that represents their skills in the industry. Understand and apply branding principles in creating a brand strategy and how that is translated into visual elements.
SEO Content Planning and Creation and Strategy Development	Discuss the basic principles of SEO content creation. Delve into the importance of creating SEO content. Experiment creating SEO content and doing keyword research. Analyse the differences between non- and -SEO optimised webpages. Investigate and prepare keywords for professional branding purposes and create content based on keyword research. Consider social media as part of this strategy process.
	The role of social media and SEO and how it relates to SEO and the branding journey. Create a professional brand strategy that aligns with the chosen career direction. Investigate the relevant social media channels to create and the type of content that will support the portfolio.
	Create strategies for the various channels of marketing your brand digitally. Create an SEO strategy on how to target particular keywords and create written content. Create a social media strategy for content created and future content.
Professional Portfolio	Understanding the purpose of a professional portfolio as a representation of their skills as well as their brand. Discussing the branding journey of the portfolio. Investigate portfolio inspiration and applying critical thought to creating support your portfolio items (information, motivations, and captions).
	Develop a portfolio based on the brand strategy.
	Create strategies for SEO, web design, print design and social media.
Professional Portfolio	Implement design and other strategies.
	Produce a digital and print portfolio with well-thought-out and easily implementable strategies for social media.

4.4.7 MULTIMEDIA PRACTICE 3: MUP370S

"The purpose of this subject is to analyse, conceptualise and produce narrative orientated design projects. Critical thinking and design implementation will centre on concepts of creative direction and narrative design… The purpose of this subject is to enhance the student's understanding of the digital world and the role that Multimedia plays in it. Students are to create visually engaging projects that showcase their understanding of; design concepts, social responsibility in a design environment and creative narrative design" (Cape Peninsula University of Technology, 2018).

Table 4.11: Multimedia Practice 3 topic list

Narrative retouching workflows and colour workspaces
Narrative image manipulation Lab colour: workflow in a digital environment Photography and the studio environment Narrative retouching Art direction and creative direction for narrative storytelling in the digital space
Design thinking for motion in a studio and postproduction environment
Production Workflow Documentary style motion graphics and editing Tools and production equipment (overview) Photography and photo manipulation workflow Demo reel creation

4.4.8 MULTIMEDIA TECHNOLOGY 3: MUT370S

"On successful completion of this subject, you will be able to: Design, construct and debug JavaScript applications. Specifically, your skills will be developed to successfully incorporate HTML5 CSS3 and JavaScript code. Comprehend and debug typically programming constructs. These include variables, loops, and functions. Object orientated programming techniques will be emphasised." (Cape Peninsula University of Technology, 2018).

Table 4.12: Multimedia Technology 3 topic list

Advanced Scripting Techniques
Exploration of Multimedia Projects
Why JavaScript has become THE essential language – Reorientation
Essential web technologies
JavaScript Revision
General debugging strategies
GitHub introduction
Visual Studio Code highlights
Basic CSS and CSS3 techniques
JavaScript Competency Licence
Compare and contrast IDE's
WordPress review
CSS3 animation
GitHub project hosting
Programming best practice

JavaScript Functions deep dive
GitHub hosting
XML vs JSON
Database Structure
Compare and contrast JS UI libraries
Server side technologies
Time sensitive coding – Promises vs Observables
Advanced debugging Techniques
Designing web services
Live hosting of projects
Handling project code

4.4.9 MULTIMEDIA INTEGRATED PROJECT 2: PRT260S

Multimedia, as a programme at CPUT aims to bring all of the leaning of students and to promote the integration of their skills via this subject, the Integrated Project. The aim of this subject is to urge learners to consider and exercise all that they've learned in the other subjects by producing a unified, single project containing all aspects of what they've learned. Learners are required to source their own 'clients' – an NGO or NPO and offer them services that would assist the organisation in furthering its aims.

Specifically: "The final integrated project is a culmination of all your subjects. The project compels you to use a combination of your skills and training gained over your academic career. Additionally, it will prepare you for industry and the harsh rigours and discipline that are expected once you are in the workplace… You will be assessed on your command of all design processes as well as your ability to apply these principles in real-world situations taking your clients' needs into consideration. The final products will need to exhibit a high level of design thinking and presented professionally. Technical outcomes that will be assessed will be the ability to deliver a product in the various formats while maintaining quality. Creative outcomes to be assessed will be the editing of footage to create a rich and engaging video that will include sound design and Mograph (motion graphics) design as elements for the production. This is a culmination of all your skills developed thus far and it is expected of you to develop a video production of noteworthy value that can be used to create awareness in a real-world setting. For the MUT260S course you will be assessed on how well you managed to solve the technical challenges. Key aspects include functionality, interoperability code, presentation, documentation and appropriate use of technology. You should be present during each of the three WIP (Work in Progress) presentations and a final presentation

and hand-in. Mark allocations will be made by means of rubrics after each presentation" (Cape Peninsula University of Technology, 2018).

4.4.10 Multimedia Integrated Project 3: PRT360S

Project 3, as with Project 2 requires that students work as a team to produce a final integrated multimedia package for a real client. Students are required to work with community organisations with a view of furthering the aims of the organisations. These are required to be NGOs and NPOs. The project brief states: "This project is group-based and students will be assessed on their ability to FOLLOW THE PROJECT GUIDELINES, the group's RELATIONSHIP WITH THE CLIENT and the ABILITY TO MEET DEADLINES, both internal and external. Your project group will act as a multimedia company, and you are tasked with creating or redesigning the NGO's branding with subsequent marketing material, a promotional video as well as an accompanying website.

The branding should align with the NGO's purpose and goals and be carried through all media and deliverables; the PSA or video should either assist in promoting the company's services or raise awareness about the NGO and the cause it supports, and the website should perform an informational and promotional role for the client. The group should meet with the client to determine what the purpose of the site should be, and how to best produce a website which will be beneficial to the company" (Cape Peninsula University of Technology, 2018).

4.5 Analysis of the Multimedia Programme at CPUT

The learner guides and curriculum map were examined to identify those subjects that relate only to the multimedia programme. The programme within the Department of Information Technology is structured such that all students in the department are exposed to the same subjects in the first year and subsequently select a stream they prefer for the subsequent years. They are able to choose Communications Networks (which deals largely with computer networks), Application Development (which deals largely with coding, databases and software applications), or Multimedia Technology.

As mentioned in Section 4.5, only the topics and outcomes from the learner guides were extracted to explore these in greater depth. The intent was to identify topics that involved an emphasis on either design or technology or both in order to group and cluster these into bands within which they fall.

For the first year, the only subject dealing only with topics relating purely to Multimedia is Multimedia Foundations 1. The Programming 1, Applications Development Foundations 1 and,

Communications Networks Foundations 1 and ICT Fundamentals 1 have bearing on the technical skills required by all ICT practitioners and for the Multimedia students' technical skills development as they progress through the subsequent levels. The subjects that relate specifically to Multimedia are shaded in the tables which follow.

An initial grouping resulted in the following:

Table 4.13: Subject grouping for level 1

Primary focus: Design	Has elements of both design and technical skills	Primary focus: Technology
	Multimedia Foundations 1	Applications Development Foundations 1
		Communications Networks Foundations 1
		ICT Fundamentals 1
		Programming 1
		Project 1

The other subjects (referred to as service subjects) deal with exposure to skills that support the broader skills the programme aims to grow. These include Business Practice 1 and Professional Communication 1.

If a student selects Multimedia as the stream of choice, the grouping presents as follows:

Table 4.14: Subject grouping for level 2

Primary focus: Design	Has elements of both design and technical skills	Primary focus: Technology
Multimedia Design 2	Multimedia Applications Fundamentals 2	Applications Development Fundamentals 2
	Project 2	Communications Networks Fundamentals 2
	Multimedia Practice 2	Multimedia Technology 2
		Information Management 2
ICT Electives 2	ICT Electives 2	ICT Electives 2

The ICT Electives subject could be any one of a range of offerings as an elective and could fall into any category. The service subject, in this case, is Professional Communications 2.

The subject grouping for level 3 is shown below.

Table 4.15: Subject Grouping for level 3

Primary focus: Design	Has elements of both design and technical skills	Primary focus: Technology
Multimedia Design 3	Multimedia Practice 3	Multimedia Technology 3
	Project 3	
ICT Electives 3	ICT Electives 3	ICT Electives 3

As before, the Electives subject could fall anywhere while the service subjects would be: Professional Practice 3, Project Management 3, and Project Presentation 3.

Now, on closer scrutiny of the subjects specifically related to Multimedia, and their topics and outcomes, attempts were made to group and classify topics according to themes – what their central focus and outcomes are and where they are positioned on the technical-aesthetic continuum. Each topic generally has a theory component and an application component. For the first year, all students (meaning all streams) are exposed to exactly the same subjects. From second year, there are common subjects for all streams but more stream-specific subjects (Tables 4.13 – 4.15).

In order to understand the level of focus across the technical-aesthetic divide, the topics are grouped and themed according to types of engagement and expected outcome and placed on the continuum. It should be noted that all the other, non-multimedia related subjects are not considered here.

The results of this are depicted in Figure 4.3 and Figure 4.4. The figure represents the breadth of focus on the continuum, so the narrower the bar is around the centre, the more narrowly balanced the offering is in terms of whole-brain engagement. The wider the bar is and centred – the wider the whole-brain offering is. Some slant slightly or greatly towards either side while some are squarely placed towards either extreme, while other topics, still, have small sections located in one hemisphere while extending more into the other. This is intended to show that while the focus would largely be on, say, design, that in the application, certain technical skills would be required.

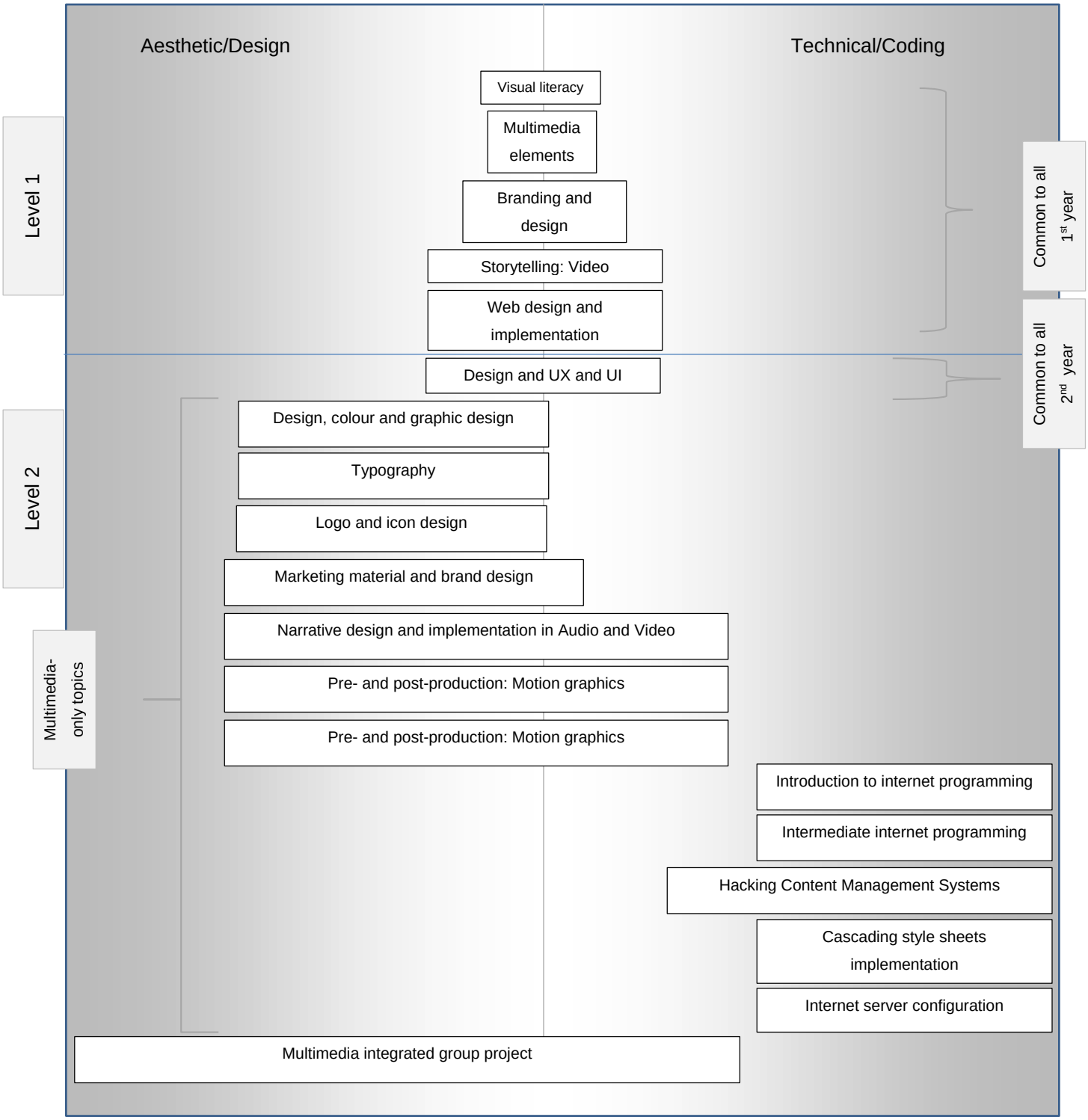


Figure 4.3: Topic focus of the Multimedia curriculum classified according to focus on design and/or technology – Levels 1 and 2

(Source: Author's own construct)

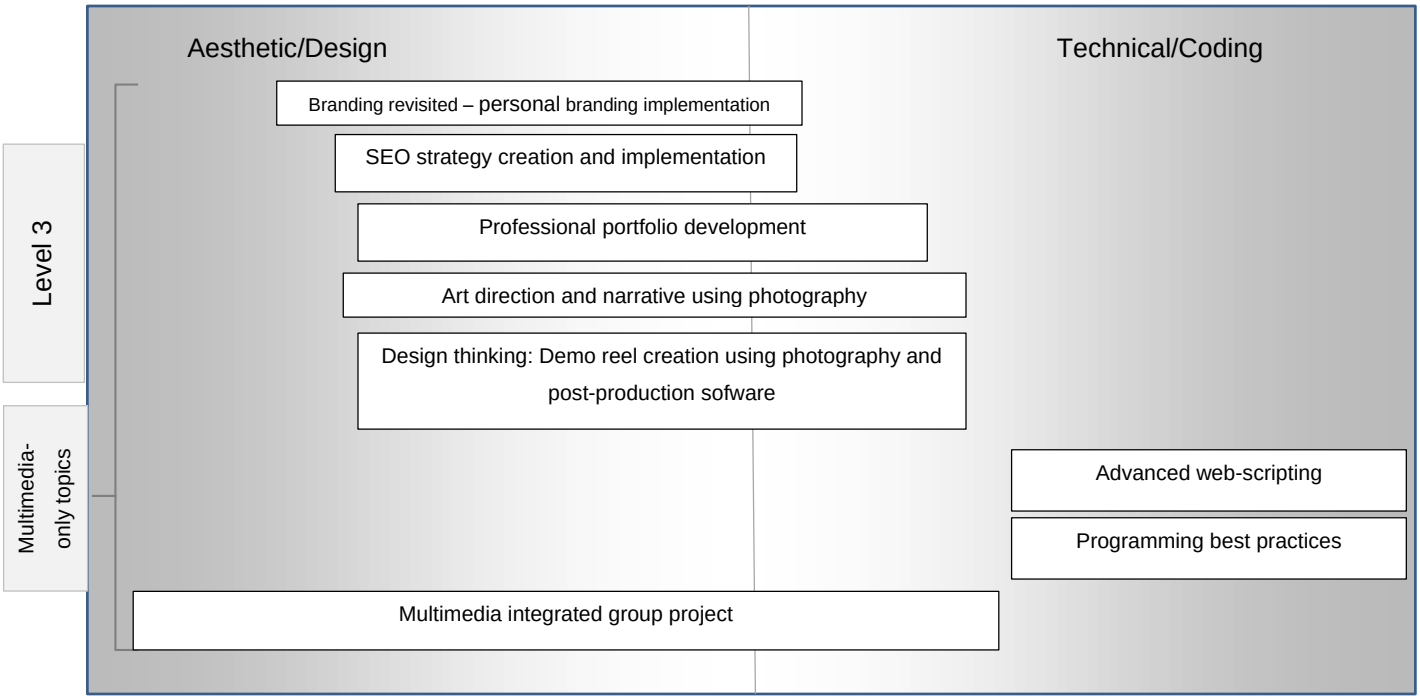


Figure 4.4: Topic focus of the Multimedia curriculum classified according to focus on design and/or technology – Levels 3

(Source: Author's own construct)

What is noticeable from Table 4.4 is that subjects which are specific to Multimedia would be the same for each stream. So, each stream would be represented equally at first-year. In Figure 4.3, therefore, it is evident that the subject offerings are designed to cater for all first-year students hence they appear to be centred around the middle of the continuum.

If one were to overlay the other subjects onto Figure 4.3, it starts to present differently. If we were to include the topics from Applications Development Foundations 1, Communications Networks Foundations, ICT Fundamentals, and Programming 1 it will start to skew the emphasis of the first-year programme more towards programming.

On scrutinising Table 4.14 for level 2 offerings, it becomes evident that only one subject (Multimedia Design 2) out of nine (1/9th) subjects has design as it's primary focus, while three of the subjects out of nine (Multimedia Applications Fundamentals 2, Multimedia Practice 2 and Project 2) i.e. (1/3rd) has elements of both. On the third year, it appears that two of the subjects deal with design and technology while only one deals with coding only (Table 4.15).

From the previous discussion, it would seem that as an ICT programme, the first year appears balanced in terms of its offering to all streams. The first year offering is not ONLY a Multimedia offering and learners are exposed to a range of topics to provide a good grounding in ICT.

For level 2, only one subject deals only with design and, equally so, only one with coding specifically for web developers. However, the subjects for level two that are located within the Multimedia stream appear to lean towards being 'whole-brained'.

The integrated projects for level 2 and 3 are aimed at bringing together the influences and exposure to all the subjects under one common project and are meant to be the most 'whole-brained' in their offering. However, it has been observed and learners and staff are reporting that the focus during the engagement with the project is more on frontend design than on back-end development and coding

Is this a problem for the learners who chose Multimedia as their stream of choice hoping to do animation, motion graphics, and other design and aesthetic-related subjects only and how do they perform in industry once graduating?

It was thought that the learner preferences and choices and staff and industry perceptions would best illuminate these queries so the interview questions attempted to address this as well.

4.6 ANALYSIS OF THE SEMI-STRUCTURED INTERVIEWS

Three sets of interviews were conducted, the aim of which was to gain a better understanding of the perceptions and preferences of students, staff members and industry practitioners. The invitation letter and the questions posed to the interviewees are included in Appendix III and the transcripts of one of each of the three sets are included in Appendix V as examples.

Each interviewee was given a code to protect their identity. The code matrix is tabulated below.

Table 4.16: Interviewee code matrix

Interviewer	Students	Staff	Industry practitioners
W	S = Student S1, S2, S3, S4, S5, S6, S7	L = Lecturer L1, L2, L3	P = Practitioner P1, P2, P3

4.6.1 STUDENT PERCEPTIONS

The following themes emerged out of interrogation of the interview transcripts of the students:

Engagement with the subjects

Perceptions about the curriculum

Personal attributes

Whole-brain attributes

The main themes are further sub-divided into the sub-themes as shown in Table 4.17.

Table 4.17: Themes emerging out of student interviews

	Main themes			
	Engagement with the subjects	Perceptions about the curriculum	Personal attributes	Whole-brain attributes
Sub-themes	Preferences and or comfort in engagement	Level and n of engagement	Self-awareness and personal growth	Perceptions
	Prior knowledge	Preparation for career	Gender	Nature vs Nurture
	Specialist vs generalist			
	Group interaction			

Engagement with the subjects

Preferences for and comfort in engagement

Within the context of the study, the students were questioned around their preferences; which subjects they prefer and why. This was done in an attempt to understand whether there was a preference and or comfort to start with and also potentially why this exists but also to get a sense of how many students indicate a particular preference or comfort.

[S1], when asked whether she prefers working with design compared to technology responded emphatically that she prefers design. She also indicated that she is both comfortable with and prefers design but if forced to do development, say for a project, that she would be able to do so.

[S2], too, indicated a preference for design but believes that this is because he did not have prior knowledge about technology at school. He also indicated that this was his third choice and not his first. His first choice to do nursing.

[S3] also expressed strong interest and preference for design though applied for IT because he wanted to be a network administrator. This raised an alert for the researcher because it indicated the potential for perhaps a widespread bias in the programme. It seemed that it would be necessary to probe this potential bias more with the subsequent interviewees.

Interviewing **[S4]** revealed something different from the previous three students. She indicated that, as a preference, she is leaning towards design but is comfortable working with both design and development. She mentioned that her leaning towards design was because she had not grown sufficiently in the technology but would like to be balanced and equally strong in both. She mentioned her concerns around the engagement with the technology subject which is dealt with later in another sub-theme.

It was interesting to note that **[S5]**, too, indicated that she is comfortable working in design and technology equally well but prefers, as with **[S4]** to work with design over technology.

It appeared, at this point that some rudimentary pattern was emerging. It seemed that some students were very clear in their indication of preference while others were comfortable with both but preferred one over the other.

Both **[S6]** and **[S7]** indicated a preference for design, though **[S6]** proposed prior bad experiences at a TVET college and earlier CPUT programming classes altered her initially preference for coding.

Prior knowledge

Students' prior experiences and knowledge emerged as a seemingly significant influencer during the interview process. Despite it not being one of the interview questions, it was soon realised that this was an area that required exploration.

[S5], for example, mentions that she attended a technical school and…

> ***[S5]**: "…then with regards to my subjects, I did civil technology as well as engineering graphics. So that's where my love for design actually started, so technical drawings and so forth"*

The experience for **[S6]** in terms of her prior experiences was concerning because she had initially wanted to study programming. She mentioned that she had taken CAT at school as a subject but subsequent experiences were not positive.

> ***[S6]**: "…I wanted to go into coding but we never had a great foundation when we started off coding, because I started with the higher certificate. So we were established at [TVET College Name] side. The first three months we only had a lecturer. After that we didn't, so that made it a bit wobbly for us. And then we came here and then we had a CNF lecturer teach us coding. So that also wasn't the greatest option to make."*
>
> ***[W]**: Okay. So in your opinion, if the coding was taught in a different way, you would be more inclined towards that? Or equally inclined to both areas?*
>
> ***[S6]**: I would say I'd be more inclined to coding.*

This represented an interesting observation in that it suggested that her negative experience with the facilitation of the coding nudged her towards the design-oriented subjects.

Specialisation vs generalisation

Multimedia as a discipline lends itself as providing the options for people to become specialists or generalists. This was of interest for the study since it was assumed that if some or other indication for preference was given, it might give some indication of the preferred thinking approaches as well.

[S1] insisted that she wants to specialise in all aspects of design and holds no interest to be a generalist. **[S2]**, **[S6]** and **[S7]** also indicated that they wished to specialise rather than be a generalist in the field. **[S3]** suggested that he would like a general understanding of the range of exposure available in the Multimedia field but would prefer to specialise since focusing on only the general understanding would make you a "master of nothing"

[S4]: Prefers to grow as a specialist in design – she also mentioned that she has a registered business and doing work related to logo design and branding and also some development of websites but would hand the coding part over to someone else only because design is easier for her right now.

[S5]: Was the only one who responded emphatically that she wanted to do all aspects of Multimedia.

> ***[S5]****: "I definitely want to do everything myself, because obviously, I'm capable. I have the basics. I'm taught how to do these things. So if I do have the skills, like why not just do everything? I know how to, just let me do it myself."*

Group interaction

Gaining a sense of how students interacted and participated in groups was considered to be an important indicator of what their preferences were. Students were asked about the nature of their involvement in groups insofar as whether they felt forced into a particular role, were these roles pre-determined or whether they chose what they considered to be the area they are strong in.

Students **[S1], [S2], [S3], [S5]** expressed similar responses to this question in that they agreed in group projects like the integrated project that each person would do what they were strong at. It was thought, therefore that a different questioning approach was needed to probe this aspect more.

[S4] indicated that this is her approach in group work as well. She would pair up with someone who would make up for where she considers herself to be weak in (audio and video production). However, she was able to slot in with branding and web development if needed.

[S6] responded differently to the other interviewees in that she felt they were forced to work on all areas, which she considered good. She added that the 'forcing' was not imposed externally but the nature of the project required it.

> ***[W]****: The pushing, is it coming from the nature of the project or is it coming from someone?*

> ***[S6]****: It's more the nature of the project, yes, because you actually don't have a choice at the end of the day. You can make a choice but then you're going to fail. So, you don't have a choice at the end of the day, and it also shows you that's how it's going to be in the industry. If you don't do the work that the boss has required from you, you're not going to get the job or you're going to lose your job like that. It makes us find a balance in design as well as the coding part.*

[S7] when presented with the question in a different way, responded as follows:

> ***[W]****: Alright. So, when you work with the projects, say for example, the integrated project, do you think that there's a bias in the project to one area or another? Let me put it this way; in your group, do you feel that you are forced to do one thing over another, or do you feel that there's a choice that you have?*

> ***[S7]**: No, that's a choice that I make personally. I stick to the design side of things. If I was in a group, I would prefer to do designing rather than the coding.*
>
> ***[W]**: So if you had a group, and I know this might sound like a weird question, but I'm just trying to understand how people arrange the responsibilities, so say you get together in a group where everyone had a preference for design, what would you do then? I know I'm throwing you curveballs now, but...*
>
> ***[S7]**: I would then do admin work, or... If I'm forced to do development I will do it, but it's not something that I prefer.*

[S7] was emphatic in her preference for design but also indicated that if that was all that was left to do, she would apply herself.

When questioned about whether they need or prefer to work in groups or alone, all students agreed that they would need to be able to be comfortable with both individual and group work.

Perceptions about the curriculum

It was construed that perceptions about the curriculum would have bearing on the study since the student perceptions and interaction with the curriculum could be an indicator as to why there may be a perceived preference for the design over the coding/development/technical subjects.

Level and type of engagement

[S1] felt that the programme was well presented in terms of balance but that there was more emphasis on Applications Development within the department. She also felt that the presentation and facilitation of the subject have much to do with student success.

[S2], too, felt that within the department, the feeling is that more emphasis is placed on Applications Development. He differed with **[S1]** though in that he considered the development aspect of Multimedia to be insufficiently covered (not enough time) but that the other subjects were covered well enough. He said that it “makes me uncomfortable” but that the facilitator does his best given the little time he has.

[S3] expressed great concerns with the way backend development was facilitated. He emphasised that it was not the fault of the facilitator since the facilitator does his best to improve the understanding but that the curriculum did not allow enough time for its proper treatment. He was most emphatic in his suggestion that had the backend development been treated differently, more comprehensively, it would have resulted in him being interested across the board. He mentioned that he found the development very challenging but had not had issues with the lecturer.

This concern was supported by **[S4]** as well. She felt that the programme was well-supported on the design and practice subjects but not on the development and backend (for Multimedia) aspect of things. She also mentioned that the relatedness to the facilitators and comfort with the teaching style was important though not a major issue and further suggested that people can be better at concentrating and find knowledge to support themselves online and that it was not necessary to be spoon-fed. She alluded to student attitudes in class that are not conducive to their own learning. She added that more investigation was needed to relate curriculum to industry needs due to the changing needs of industry.

This was also shared by **[S5]** as well but she believed that people will succeed irrespective of the way something is taught. She felt that more emphasis should be placed on the areas where people lack, particularly the Technology subject. She emphasised the need to focus more on that subject. She insisted that this is a subject that needs careful teaching.

[S6] felt that for people who did not succeed in entering Multimedia, they would be forced to do Applications Development which leads to failure since it is not their preference. She also felt that the facilitator played a major role in student success.

[S7] echoed the others' sentiments that coding for Multimedia was not well supported by the curriculum and that there was a deficit in the range of technologies they were exposed to.

Preparation for career

Questions around career-preparedness were posed in an effort to determine if there was a perception that exposure and competence in both design and technical development skills were needed. This, it was thought, would give some insight into preferences vs requirements and how this would impact on the students' motivation

The questions posed were around whether learners should achieve a minimum competence level in both design and/or development.

All learners felt that exposure to both was necessary in terms of preparing adequately for industry. At least two of the learners mentioned reading adverts for jobs where skills across the board were advertised. **[S2]** mentioned the example of building a theme for a content management system and the need to have both design and development skills. **[S4]** stated that:

> ***[S4]:*** "Yes, both – if you only want to design then do something like graphic design."

[S6] used the term 'intertwine'. She mentioned that you can't do one without the other.

Personal attributes

Though the questions were not initially worded in an attempt to understand the students' personal attributes, it emerged that this was an important consideration when considering what students preferred to do. Students often volunteered information without being specifically asked about this.

Self-awareness and personal growth

Most of the learners attributed their growing sense of identity and self-awareness to being exposed to tertiary education. **[S1]** mentioned that being exposed to all the aspects assisted her to find her preference since she actually applied to do IT and mentioned that she was not clearly aware of what she wanted to do. She mentioned two family members who were programmers so it seemed like the best thing to do. **[S2]** also mentioned that the course assisted him to gain a better understanding of what he wanted to do even though IT was his third choice.

Some had many interests which made the choice difficult since they enjoyed practical, technical things but also the creative **[S4].**

[S5] mentioned that passion plays a key role in succeeding and that the nurturing she received at school fuelled her passion. She presented very confidently throughout the interview and when it was mentioned that she appears very confident and asked how it assists her, she mentioned that it helped her to express her difficulties in the class where other students might sit quietly and not complain.

[S6] describes her earlier bad experiences with coding as a barrier to her learning but if she is "self-motivated", she can engage with it. She further offered that:

> *"Lecturers helped a lot – we're still finding ourselves. Some people know what they want to be, know what they want to do, but there are others that still struggle. We don't have our lives set out for us. Like some people say some people are just born leaders and some people are just born followers. We're still finding ourselves."*

[S7] also alluded to not sure of her abilities before choosing multimedia. The course, she said, has helped her find herself. She also mentioned that she feels threatened and

> *"might not be successful in the industry because I'm only competent in one area, design and not development – Once I run into an error I sort of give up."*

These statements are relevant in that they speak to the personal (internal) barriers to learning alluded to in Chapter 2. Though it was not the focus of the study, it is included here since it appears to play a significant role in how students engage and perform in the course.

Gender

It was not the intent of this study to consider the impact of gender on student experiences but it emerged during the interviews without prompting. It is included here since it speaks to personal motivation and potentially the impact on student preferences in the course.

[S6] recounted some of her experiences which became emotional at one point.

> ***[W]****: Okay, thank you. In your estimation, these three years now, or going into the third year, what has been most important for you in terms of your growth?*
>
> ***[S6]****: I must say personally, my confidence. In the IT industry, for a woman to be studying this, it's so hard. It's difficult because in my second year I've been broken down by men so much [crying]. Sorry.*
>
> ***[W]****: It's fine.*
>
> ***[S6]****: They would tell me I'm not good enough. They would tell me I would fail. So that didn't work out for me much. It's very emotional.*
>
> ***[W]****: Fellow students?*
>
> ***[S6]****: Fellow students in my class. So that broke me down. That broke me down, but with your lecturers, they actually feel and they know what you're going through.*
>
> ***[W]****: So would you say that while going through this experience, that you had enough support in terms of lecturers helping you through?*
>
> ***[S6]****: Yes, my lecturers, definitely [Name] and [Name] they helped a lot. It's like, we're still finding ourselves. Some people know what they want to be, know what they want to do, but there are others that still struggle...We're still finding ourselves, but the people around you that influence you, they actually have a great impact on you. It can either be negative or positive.*

It was evident from the interview with **[S5]** that students' experiences vary and their responses vary too. She mentioned that being in a largely male technical school (she mentions almost 90% male) and being in IT where there appears to still be more males than females pushes her to do better.

Perceptions about whole-brain

The focus of this study relates to the concept of whole brain engagement. It was crucial to determine student perceptions about this concept. The interviews were aimed at attempting to

understand if there was a preference for working in one space over another so questions were aimed at this.

Students mostly indicated a preference for working with design. It was evident from the interviews that the majority preferred and was comfortable working with design but when asked about whether other areas can be stimulated, they responded in various ways.

[S1] has a very strong preference for design but indicated that whole-brain people can be nurtured but alluded to it largely depending on own preferences and passions. She refers to herself as right-brained. At this point, I went off-script and asked if she thought someone like Leonardo da Vinci, with all his abilities and skills, could be grown or whether were born that way. She believed that these people can be grown. She also mentioned that the class split in terms of interest in design versus technology was about 70/30 in design's favour. She continued to mention that the 70% don't find the design subjects challenging but find the technology subject to be a big challenge. When probed further on this she responded as follows:

> **[S1]: "***I am going to phrase this. A mathematical problem and a design problem is not the same. With design your only challenge really is once you get a brief, developing exactly what that brief requires, that is your kind of challenge because how you interpret things and how your client, for example, wants to see something is very different. So you get a brief, you need to do something and so your creativity is what you really struggle within design. It is the limitations that you put upon yourself. I do not know how to explain that better.*
>
> *But then in terms of a coding problem solving I view that as more analytical, structured, you confined because there is only a specific solution. I do not know if I am explaining that the best way"*

She also mentioned that she thought **[S4]** is one she would best describe as whole-brained

[S2] also thought that whole-brain individuals can be grown provided there is interest and passion but there are some people that are more 'talented' than others in something. He believes that hard will only further your progress to a certain point but that talent would take you further and that the environment plays a huge part in the process.

[S3] felt it was a case of nature versus nurture. He believes that all aspects of the brain are needed on the whole but if there's interest or desire for some direction, say design, then this is what is nurtured and if you wish to solve problems then you tend to move in that direction. He also believes

that da Vincis are born with an innate ability but it can be taught though he feels that people gravitate towards a preference.

[S4] stated as:

> **[S4]:** *"It's all about what is being harnessed. So if you're only going to feed one thing, then only that one thing will grow, you see, but if you're trying to feed both sides then maybe both will grow. It's like a plant, if you water both then it will grow. Da Vinci's can be grown."*

[S4] is the student that most people in the interviewee group (students and staff) felt was a good example of a whole-brained person

[S5] who refers to herself as whole-brained believes that people naturally move in the direction that interests them and even become self-taught and that some are just 'naturals' at it. She believes, though that it can also be trained.

[S6] believes that some people are born with it but also that it can be trained but might take longer.

[S7] believes that people aren't born with any special skill and that all traits can be trained.

4.6.2 FACILITATING STAFF PERSPECTIVES

The perspectives of the facilitators are key to this study. What they perceive to be important in terms of their engagement and translation of the learning outcomes into classroom practice has an impact on the students' learning experience and potential preferences. The facilitators were asked similar questions to the students but from the view of the facilitator. It helps to sketch a brief profile of each of the Multimedia facilitators.

[L1] Facilitates the design-related subjects. She is a graduate of CPUT's Multimedia programme. Has 14 years of experience in related industries.

[L2] Facilitates two subjects on the programme that deals with a variety of subject matter that relates to design, creativity and application of these using equipment and software. He has 17 years of experience in the creative industries both locally and abroad and has an advanced qualification in Multimedia Design and Production

[L3] Facilitates all the technology subjects – topics dealing with programming, backend development and coding. He has been facilitating these subjects since 2001 so has 19 years of facilitation in the subject area. He has vast experience in many programming languages and describes himself as a "techno-nerd".

The following themes emerged out of interrogation of the interview transcripts of the staff:

Engagement with the subjects

Perceptions about the curriculum

Whole-brain attributes Whole-brain attributes

The main themes are further sub-divided into the sub-themes as shown in Table 4.18.

Table 4.18: Themes emerging out of the staff interviews

	Main themes			
	Engagement with the subjects	Perceptions about the curriculum	Whole-brain attributes	Other considerations/ recommendations
Sub-themes	Perceived preferences and or comfort in engagement of students	The need for core competency development	Perceptions about whole-brain attributes and training	
	Preference for being a specialist or generalist	Adequate support for the curriculum		

Engagement with the subjects

Perceived preferences and or comfort in engagement of students

[L2] Checks on students interests at the start of each year to get a sense of what they like and dislike and their motivation for applying for the course. He reports the tendency for students to gravitate towards what they have been exposed to or what inspired them in their lives.

According to him, they respond negatively to any talk about 'backend' – "when you look at their faces and their body language and you hear how they speak about it, it's always very closed off". He also says that students find programming restrictive in their ability to be creative with a lack of flexibility to express themselves. **[L3]** believes students tend towards their preference as well. Even the 'bright' students prefer working more in one area than another. He does mention that he observes that there is a small group of students that prefer a blended experience. **[L1]** believes that students can function to a reasonable extent across the divide but she notices a tendency of

students to move towards that which they prefer. She recounted her own experiences as a Multimedia student where she preferred the design and creative side of the programme. She also mentioned that she had one exceptional student in the previous year who graduated with a Cum Laude (**[S4]** in the student interviews) who excelled in all areas. She also mentioned that in group-work, some groups would focus almost entirely on the technical aspects while others would be more design-oriented. She mentions a particular student who carried the whole group by doing all the work on her own because the rest of the group did not contribute along the way.

Preference for being a specialist or generalist

[L1] believes that students who have a clear idea of what they want to do will find a speciality soon, but those students who are still unsure will tend towards being a generalist. She encourages students to try different things and potentially start small businesses to aid them to make a decision.

[L2] believes that it helps to start out as a generalist and then move to specialising. Smaller industries and start-ups appreciate the generalist as they have a range of skills that can be useful for the company.

[L3] is also of the view that students, even senior students, have not quite matured to know exactly what their niche areas are so he thinks that students would take a generalist view in their engagement with the subjects initially.

Perceptions about the curriculum

The need for core competency development

[L1] recounts her own experience again about how challenging she found coding but agreed that having a minimum competence in it has helped in certain instances. Her preference was for design but coding did provide insights into how things work. She further supported that students should be exposed at least to a minimum core competency of skills since the industry has evolved from when she was a student. **[L3]** agrees that all students should be exposed to both areas at least to some basic level of competency.

[L2] agrees that students should have some competence in both areas because they are intimately linked. In his words:

> ***[L2]**: "In today's world, just from being in the industry, there's no one hat that any designer wears…and employer values your ability to use both sides of your brain, left and right, the logical and the creative. And for students to be competent, or semi-competent, or*

somewhat competent in both the technology side and the design side only enhances their ability to thrive."

Adequate support for the curriculum

[L1] is of the opinion that the course is adequately supported insofar as its provision for the students' needs is concerned. She asserts that the curriculum needs to change as the technology and industry changes and she believes that currently, this is being done. She further re-affirms that:

> ***[L1]:**" Design concepts are driven by technology. And all of that is put into practice in the practice subject. And I think that without the one, the other, you know, could probably live on its own, but it is so much more because they have each other. It's basically like a nuclear family."*

In **[L2]**'s view, he contends that all the core competency exposure is in place. He expressed concern about the limited time that he has to cover what he considers to be essentials. He believes, too, that the type of engagement has led to students seeking answers and solutions themselves as a result of stimulated passion.

[L3]'s response to the question was quite interesting. He agrees with **[L1]** and **[L2]** that within the course, core competencies in design and technology are adequately supported. He continued to say, however that:

> ***[L3]:** "…just as I would, as a non-designer, looking at the programme I actually feel that even though lots of people look at technology as being the 'difficult subject' in inverted commas, I actually have a great appreciation for the design skills that our students end up having, because I know it's actually a lot more difficult to teach someone really good design, than teaching them how to code. Because in a way, design is almost an art, and I think it's easier learning coding skills because it is even a self-teachable endeavour, but whereas design, it's a lot more I've forgotten, I don't have the right words for it, but a lot more...*
>
> ***[W]**: Does it speak to natural ability?*
>
> ***[L3]**: Yes. You're either a natural designer, and you've got the flare and the colour sense, and all the aesthetic ability to be a good designer. So if a teacher or lecturer can actually bring all those subjects to the student, I would say it's quite a task. Whereas becoming a coder, there is a reasonably formal process, which can be taught and which can be followed to actually becoming a coder. Even though, yes it requires logic and all of those,*

but in my mind at least, it's an easier road to become a good coder, than to become a really good designer. I know… Ja."

This was probed a little further with **[L3]** who believes that anyone can be taught to code yet not anyone can learn to design because it requires a certain natural ability according to him.

When asked if he would be able to facilitate the design subjects if he were told that all coding subjects were covered, he responded by saying that it would be extremely difficult but that perhaps coding is easy because he finds it easy.

Whole-brain attributes

[L1] perceives whole-brained to mean the degree to which something is viewed from all perspectives and to make sense of it. She considers herself to be that way when asked but feels she leans more towards the creative than to the analytical side. She believes she can access all areas but has a preference for the creative. She does contend, too, that creativity is not constrained to being able to be artistic but is inherent in most of what we do.

In **[L2]**'s view, the general perception is that left-brain is associated with logic and right with creative processes but they do cross over and you can have a whole-brain approach since each situation requires a different approach. You can't function effectively in our environment without adopting a whole-brain approach, according to him. When asked whether people like da Vincis can be grown or whether this is an innate ability, he believes that people are born with innate abilities whether it leans to the logical or creative side but that nurturing is the key element. He also contends that there may be people that are born with 'natural' talent but this will only take you to a certain point. Innovators, according to him, move beyond natural talent. They are able to learn more and integrate learning from a variety of sources.

[L3] believes da Vincis of the world are born but also cautions that da Vinci would not have become known for his achievements had he not had very rich benefactors. So, the environment, according to him plays a huge part in the success. He believes that coding can be made more 'fun' given more resources and time and if coding is embedded in an artefact. So, coding a robot, for example, would improve motivation and therefore curiosity.

Other considerations and/or recommendations

[L1] Insists that the 'soft skills' like professional communication, project management and business skills be emphasised as these are important from a vocational perspective

[L2] feels that there needs to be more practical art direction which should balance the theoretical art direction. The application of principles of design such as composition and light and how you

incorporate that in a practical environment should be introduced. He affirms that the theory is important but should be paired with practice. He also mentioned introducing 3D modelling and rendering in addition to art direction. He added that the programme would benefit by including design analysis, from a theoretical and practical position. They should be given opportunities to increase their understanding of design itself, of media in a general environment. More collaboration, inter programme and inter departmental collaboration.

[L3] Mentions time as a major obstacle to success in the technology subject. He feels the curriculum is too congested and threatens the learning environment. There is little time for experimentation according to him.

4.6.3 INDUSTRY PRACTITIONER PERSPECTIVES

Since, as an institution of higher learning, part of our mandate is to prepare students to transition into industry, it was key to the study that the perspective of our industry practitioners who have employed our students was obtained. The questions that were posed were aimed at understanding whether they observed noticeable preferences for design or development by our interns and graduates and also what they consider to be important in terms of how we prepare students for industry. The interviewees were chosen because they were either graduates of the Multimedia programme with an excess of five years in industry or they had been connected with the programme in some way before or they were graduates and working in industry but had also facilitated the instruction of some programmes on the programme at some point in time.

This was done because it was thought that these individuals would have a unique understanding of their learning experience and, due to their years of experience in industry and having facilitated some of the training on the programme, would also understand the industry needs and provide a comparative perspective which might prove instructive.

[P1] Is a Senior Open Source Developer and Open Source Solution Designer with over eighteen years of experience in the industry. He also taught on the Multimedia Programme from 2003-2005 and has worked with Multimedia interns and graduates in his current work environment.

[P2] Is a Multimedia graduate from CPUT and has sixteen years of experience in the industry. She has worked as a Multimedia Designer, eLearning Instructional Design Manager, Senior Learning Specialist, and currently as Team Lead: Learning Experience Design. She has also facilitated the Multimedia Design level 2 and level 3 subjects from 2009 -2012

[P3] Is also a Multimedia graduate from CPUT and also has sixteen years of experience (a classmate of **[P2]**) which includes involvement in projects across e-Learning and e-Marketing. With his qualification in Multimedia Technology, he has an applied understanding of the editorial and technical requirements for creating and disseminating content to large online audiences. His experience in a wide range of Government-to-Citizen digital campaigns has made him a sought after talent for converting web traffic to business goals via detailed analysis and reporting. The areas of speciality include: digital platforms strategy, policy and implementation, digital team management, websites, social media and mobile applications management, stakeholder engagement and project management.

He was also named one of South Africa's Top 200 young South African's by the Mail and Guardian.

Important note: Since academic programmes evolve over the years, these practitioners were exposed to a curriculum which differs from that which the current cohort are exposed to. The earlier curriculum had more exposure to technology and programming than the current programme so reports from current students and staff may differ from what our older graduates report.

The themes and sub-themes that emerged out of the industry interviews are tabulated below.

Table 4.19: Themes emerging out of the industry practitioner interviews

	Main themes			
	Perceptions about industry needs	Perceptions about the CPUT's training	Personal preference/ experience	Whole-brain attributes
Sub-themes	Preferences and or comfort in engagement of graduates and interns	Preparation for industry	Comfort in either space	Perceptions about whole-brain
	Core competencies exposure		Personal journey	Nature vs Nurture
	Specialist vs generalist		Gender	
	Recommended additional skills			

Perceptions about industry needs

Preferences and or comfort in engagement of graduates and interns

[P1] believes that engagement across the design-development continuum is largely dependent on the individual. Some students excel in either space but even though we may expose students to all the tools and resources to operate across the divide, he is not convinced that it is possible for them to excel at everything.

[P2] says that what she truly enjoyed about the course was the exposure to the whole spectrum of potential skills but insists that most students choose one or other as a preference because of their individual affinities. She believes this occurs even before they step into the programme. Without asking her specifically about this, she offered that some students are able to function equally well across the divide but these make up a very small percentage.

[P3] shares similar views to **[P1]** and **[P2]**. He believes that people have strengths and comfort and enjoyment working in one of the areas. He sees people naturally lean towards the side they are comfortable working in particular in group projects. As with **[P2]**, the course offered them the opportunity to see the broader picture. He says:

> ***[P3]:*** *"I think that the thing I most appreciate about multimedia is that it gave us that broader view, and I think that's a strength that multimedia students from this programme have, that I've seen in industry."*

Core competencies exposure

[P1] agrees that it is necessary for Multimedia graduates to have been exposed to all aspects of the discipline since, with the current trend in technology, you can't complete frontend development without some form of coding.

[P2] insists that students must be exposed to all skills competencies at least at a basic level. The interesting comment that followed was:

> ***[P2]:*** *"…even the thing they do not like doing."*

She mentions a particular colleague (a former Multimedia student of hers) who claims to not be good at either design or development yet he is an amazing asset since he has a good understanding of both areas.

[P3] says that even students who have not been exposed to the Multimedia programme at CPUT, in his experience, will still gravitate towards their preferred areas. According to him, even the industry structures the workplace this way. You will have a design team, a development team and

so on. He does believe, though, that students should have a basic competency in all areas and shares that during interviews, even though the specification for the position might be specific, he finds that when a candidate exhibits some form of flexibility, he finds that appealing, even if they don't have to demonstrate complete practical ability.

Specialist versus generalist

[P1] thinks that graduates will start out as generalists but eventually find a preference. He says that there is great value in being exposed to all aspects of the curriculum since it gives one an understanding of the needs of a project but it does not imply that you have to specifically do it or be good at it.

[P2] suggests that if students started out with their own business, they would probably wish to do everything. She advises that they will probably end up doing that which they are most comfortable with ultimately as they progress. Some might wish to purely manage the project since they have an understanding of the needs. In this regard, she mentions a fellow graduate who is doing exactly that.

She also mentions that if she were interviewing someone, she would want people that can do a little of everything but have the ability to learn and develop more.

[P3] believes that it is strongly linked to personality. He suggests that people that tend to be more introverted would prefer to do much of what the job requires whereas people who enjoy working in teams, will enjoy being a specialist and hand over a job to another when their particular skill is required for the job but as mentioned in the previous section, would find it appealing if a candidate for a job interview demonstrated some form of flexibility.

He also says that the type of industry would somewhat dictate the kinds of skills required. Smaller concerns would want a more hybridised set of skills where larger organisations would specify a narrower set of skills.

Recommended additional skills

[P1] is of the opinion that we are doing well in our current dispensation of the curriculum but believes too, that we should be designing our curriculum in such a way that students remain adaptable due to the rapidly changing nature of the industry.

[P2] believes that the programme is adequately preparing students for industry in the approach that it adopts though students need to be reminded to take ownership of their own growth because the training does not stop at university. The learning continues beyond. The emphasis must be on continued learning.

[P3] suggests that we should be giving more attention to project management since all of the industry is based on distinct projects. Practitioners give much attention to their work without giving too much thought to time management, he says. He also mentions that sound communication skills and the ability to present well are important in the industry so professional communication and project management are definitely important skills to be exposed to.

Perceptions about the CPUT's training

Preparation for industry

When asked if, according to his perception of our training, and his experience with the students that have come from our programme into his industry, we are doing enough in terms of exposure so that they may find their strengths, **[P1]** responded with an affirmative.

[P2] agrees that having been exposed to many aspects of the discipline helped to identify the areas she is particularly interested in and further says:

> **[P2]:** *"Hundred percent. I know for a fact that it is like that for others as well who have come out of the course."*

[P3] suggests that particularly in smaller environments, as with freelancers, which he was at some point, having been multi-skilled was able to help him function. He also feels that even though some students ended up in film direction or purely in the audio or 3D space, the understanding of the whole spectrum of skills required by industry, even though they might not realise it, influenced their careers in some way.

Personal preference/experience

Comfort in either space

[P1] was emphatic about not being able to work in the design space. His experience has taught him that he can appreciate that his designs are not as good as others and he therefore not comfortable working in that space.

[P2] realised early on where her preference resided. She mentions that even though she could pass the programming aspects of the course and even do well in some instances, she did not prefer to continue to develop in that subject.

[P3] though he says he is comfortable working with both technology and design, he leans more toward the design space of the discipline. He would leave the heavy coding aspects for someone more proficient in the area to attend to.

Personal journey

[P1] recounts his own personal journey and mentions that he has always only been interested in certain things like tinkering and inventing but insists he could not draw. He observes the same things in his own children. Given the same musical instrument, the one will bang on it with no concern for what it sounds like while the other will try to make some sense of the experience and produce a meaningful tune.

[P2] recalls how she was working as an administrative person in sales and realised that in her circle of friends, all of them appeared to be working in professional spaces and this prompted the desire to want to do more for herself. Having access to go and study made the difference in her life.

She requested that the following part of the transcript be include because she felt that it was a very important point to be made:

> ***[P2]:****" But you know what, you know what, I think what the course did, I think up until that point I would not have considered myself a creative person. I mean I would not have, there was no avenue for me to feel that. I never, I cannot draw so I am well 'I am not creative,' and then I started that course got exposed to other ways of being creative and all of a sudden I am hey. I am creative now. So that is very important please put that somewhere."*

[P3] started out his journey with a small business where he was the only person completing the tasks. He relates that having had exposure and an interest in working both in the design and coding space helped him significantly

Gender

[P1] agrees that in his environment, from what we both observed, the development space is dominated by males. He could not venture a clear reason but suggests that it could be the way the genders were socialised as children. He also recounts that as an engineering student, there were comparatively very few females.

[P2] offers, without prompting, that learning the practical aspects of cables and connectors and computer hardware helped a great deal when entering the workplace since:

> ***[P2]:"*** *You're now coming into a space where you are, especially as female, you are think of it? You're not really expected to know these things…But I think that with what is happening in the web development of the role of the now what is called frontend developer having emerged I think that opened up a lot of doors for females because it is coding but it is not deep in the code and it is still a level of, not design as such, but like design."*

Whole-brain attributes

Perceptions about whole-brain

[P1] is of the opinion that preferences are innate and that one is born with certain tendencies towards what you might be good at. He believes that people like da Vincis are born but required the right environment to flourish and freedom to explore all that they are born with.

[P2] suggests that there are some that born this way and are naturally inclined to be this way while others not. It does not mean that they cannot be trained, according to her, but it would not occur naturally.

[P3] does not believe that people are purely left- or right-brain dominant. He suggests that there may be cases like that but he has not observed it during his experience in industry. He believes he is a whole-brain person leaning towards design. He recounts how, as a child, he enjoyed drawing and art and how he was inspired by video games, where the graphics and technology interacted.

On reflection of his home environment, he has given this much thought with observing his own child. There appears to be an innate skill or range of skillsets that he thinks we are born with.

Nature versus nurture

[P1] says that though you are born with certain skills or affiliation for certain things, these will only develop if they are nurtured.

[P2] mentions her own child and her and others' interaction with her child and their attempts to box her into preconceived notions of the things girls should do. She has a problem with this and believes she should be nurturing different aspects of her child and the things she is interested in and that this might change to something else in future.

[P3] sketches a scenario of someone exposed to technology and one who is not. He says that, hypothetically, if he lived in a remote, rural area and was very artistic, but not exposed to technology, the art would have evolved differently; perhaps as a painter or some other form of artistic expression, but since he has had exposure to technology, he might utilise the opportunity to combine the two.

4.7 ANALYSIS OF THE INTERVIEW DATA

4.7.1 STUDENT PERCEPTIONS AND PREFERENCES

Seven senior students were interviewed using a semi-structured approach. The invite, context and contextual questions are included in Appendix III. The themes and sub-themes that emerged out of the examination of the transcripts are discussed in the previous section.

Student perceptions and preferences

All but two of the seven students indicated strong preferences for working in the design space. Some indicated that they had applied for other programmes but ended up in IT.

One of the students indicated a prior bad experience with programming which led her to move towards Multimedia even though she initially wanted to study coding.

What appears to have emerged, thus, is that there is a general strong preference for the design subjects and less for the technology subjects for all of the students. The two students who indicated that they are comfortable working in both spaces, though comfortable, preferred design.

This raised questions about whether it was because of the current curriculum arrangement or other factors affecting motivation or just general exposure to the technology aspects.

Prior knowledge

A possible influencer of student preferences emerged out of the interrogation of this sub-theme. It was not initially part of the semi-structured questions but emerged out of repeated references to prior knowledge by students themselves. Those who had been exposed to some form of programming or technical subjects at secondary school level appeared to believe that this would provide a strong basis for succeeding in IT. One student's prior experience in coding was actually a negative influencer, as mentioned thus affecting her preference.

Specialist vs generalist

Six of the seven students indicated that they ultimately wish to specialise in design with one student mentioning that he would like a general understanding but eventually would prefer to specialise in design.

Only one student indicated that she wants to be exposed to, and practice in all aspects of Multimedia.

Group interaction

All students indicated that when approaching the integrated project for the first time, they usually discuss the roles of each member and most preferred those aspects that relate directly to design. One student indicated that though she preferred design, she would attend to the development side of things but generally chose to pair up with students that she felt, provided for the deficit in her skills. Another of the interviewee's preference for design was so strong that when asked if all the design aspects of the project were attended to, what would be her choice, she responded by saying she would do the administrative work.

4.7.2 PERCEPTIONS ABOUT THE CURRICULUM

Level and type of engagement

There appeared to be a general perception by all of the interviewees that there is a departmental preference for Applications Development as a stream. They all agreed that the Technology subject was not well supported and felt that not enough time is afforded to developing the web development and scripting aspects of the programme with one student suggesting that had this been different, he would have been interested in all aspects of the programme but tended to avoid the technology due to the deficits.

This is in contrast to what past graduates are saying since they indicated that the programme, during their time was adequately supported and presented across the spectrum of offerings.

Note that mention has been made of the changes to the curriculum since these graduates have been in the industry.

Preparation for career

Despite having a preference for design subjects, all the learners felt that exposure to all aspects of the programme was needed to best prepare them for industry. Two of the learners recalled having seen adverts for jobs requiring a broader set of skills which suggested that a broad exposure was necessary.

4.7.3 PERSONAL ATTRIBUTES

Self-awareness and personal growth

Most of the learners indicated a lack of full understanding of their preferences and interests before entering the programme. One student indicated that she was clear on what she wanted to do and

what she is passionate about but the rest attributed the evolution of their self-awareness to being exposed to tertiary education.

This was not part of the focus of the study but students continued to allude to this that mention is made of it here since it refers to the personal attributes as potential influencers of student academic experience as mentioned in the literature review.

Gender

Gender, too, was not part of the original focus of the study but its influence was so impactful on the female students' experience to the point that an interviewee became emotional about her experiences in the traditionally male-dominated programme and how it affected her choices.

It was noted that the intervention of her lecturers played a huge role in her dealing with her experiences.

This lends itself for possible further inquiry in, potentially a different study in future

4.7.4 WHOLE-BRAIN ATTRIBUTES

Perceptions

There was a varied response to the questions surrounding whole-brain attributes.

Some of the learners believed that people that can function highly across the design-technical divide are born that way, where others felt that people can be trained to be more proficient at using the whole brain. Nature versus nurture was mentioned where students felt that the demonstration of skill in design or technology would be dependent on what people were exposed to and how they were nurtured. Though all believed that people can be trained in a whole-brained way, they mostly suggested that people will find their preference in some direction at some point.

One student was mentioned by other students and the staff as being an example of someone they would consider to be whole-brained where another student described herself as being able to function in all areas. Both these students did indicate a preference for design, though. One of the students mentioned that this is because she felt that the support for the technology subject was lacking and this would be the reason why many students tend to prefer design.

4.7.5 Staff perceptions about student engagement with the subjects

Perceived preferences and or comfort in engagement of students

The general feeling by the staff was that they all noticed a definite preference towards one or the other when one considers preference for either design or technical coding. They do believe, too that students can function to some degree across the continuum but will generally tend towards that which they prefer. One lecturer reports her own experiences with coding and her definite preference for design. The other two lecturers indicated their own preferences as being in either space for each of them. The facilitator for technology mentioned that he thought that design was significantly more difficult than coding which was interesting given that most of the learners and other staff held the opposing view.

The consensus appears to be that most of the class gravitate towards design rather than the technology subject. One of the lecturers suggested a 70/30 split with 70% having a high preference for design.

This raises key concerns for how the programme is facilitated since it appears that (as reported by most learners and the staff perceptions) the support and exposure to the technology subjects might be severely lacking.

Mention was made by two of the lecturers about **[S4]** who they describe as being whole-brained.

Preference for being a specialist or generalist

The general feeling was that students who have a clear understanding of who they are and what they prefer will tend towards specialising right away while those who have not matured enough yet, would and should approach the programme with a more generalist view and, once having had enough exposure, choose a speciality.

4.7.6 Staff perceptions about the curriculum

The need for core competency development

It appears that provisioning for competency development in all areas is supported by the staff as well as the students. The staff generally believe that with the trends in industry today, students would be disadvantaged if not exposed to all areas, even though they may choose a speciality. Having a core and at least minimum competency in all areas will assist them when entering industry, according to them. One of the lecturers, despite having a strong preference for design,

recounted how having been exposed to coding and technology provided her with much broader insight and understanding of how all aspects interlink.

Adequate support for the curriculum

The staff agreed that there is adequate support for the development of core competencies in the programme but proposed that there was not enough time allocated per subject to cover what they consider to be important.

This concern aligns with students' concerns that not enough exposure is given to the technology subject. This contrasts with what the graduates are saying since in their view there was adequate exposure to technology during their time. It is important to note, though, that during their time, they were exposed to two subjects (totalling 16 periods per week) that dealt with technology and one that dealt with design (totalling eight periods) whereas the current cohort have one subject that deals with technology (totalling 4 periods per week for the second year and 6 periods for the third year).

This may be significant since it aligns with the staff and students' claims that technology exposure is not adequately supported. This aligns with what Figure 4.2 and Figure 4.3 appears to suggest. Reviewing these two figures, there appears to be a significant exposure and slanting towards design and less exposure and emphasis on the technology subject.

The technology subject facilitator's comments support this apparent lack of support. He is concerned that the curriculum is too congested and there is not enough time to adequately expose students to the core skills that they require.

4.7.7 Staff perceptions about Whole-brain attributes

Perceptions about whole-brain attributes and training

The staff members generally felt that people that function highly across the continuum are born with these innate abilities but also contend that we all use all parts of the brain generally but have preferences for working more in some spaces than others. They believe that people can be nurtured in all aspects of brain development but generally, they will gravitate towards that which they are comfortable working with.

The staff and student perspectives on left- versus right-brain and whole-brain engagement appear to be similar.

Other considerations and recommendations

The lecturers made some suggestions for improvement which included mentioning the importance of skills in professional communication, project management and entrepreneurship. Other suggestions included improving art appreciation as well as inter-departmental collaboration.

4.7.8 INDUSTRY PERCEPTIONS ABOUT THE NEEDS OF INDUSTRY

Preferences and or comfort in engagement of graduates and interns

The industry practitioners (some including graduates from our programme) all agreed that students that have come from the programme at CPUT and others that work in their environment naturally tend towards an area of engagement that they feel comfortable in. This aligns well with what students and staff were saying about preferences and comfort as well.

Core competencies exposure

The consensus amongst the practitioners was that exposure to all areas was important in preparing students for industry. They might be uncomfortable working in some space but having the broad exposure allows them to be better practitioners, particularly since the product development that is required in industry today requires an understanding of design and technology even though students may excel at one over the other

Perceptions about specialising or being a generalist

Views were slightly different regarding this point. Some believed that students would start out having a generalist view while another mentioned that is depended on their personality.

This aligns with what the staff were saying in that students will start out as a generalist until they mature enough to make informed choices.

Two of the practitioners indicated that they would find someone with a spread of skills more preferable in what they would look for in a candidate for a job.

Recommended additional skills

The practitioners emphasised the importance of training for adaptability due to the rapidly changing nature of the industry. They also mentioned the importance of ownership of the learning process and continued learning. Attention to project management and communications skills was also mentioned as being important to focus on.

This aligns with what the lecturers were saying as well. The current dispensation of the curriculum is exposing students to the skills mentioned by the practitioners so it appears that there is provisioning for this.

4.7.9 Perceptions about the CPUT's training

Preparation for industry

All the practitioners were in agreement that the programme (i.e. the programme they were exposed to) is doing well in preparing students for the environment. This is in contrast to what our current learners and some staff are saying which suggests that the claims made of deficits in the technology provision might require further scrutiny.

4.7.10 Personal preferences and experiences

Comfort in either space

There were varied responses to this are of enquiry. One practitioner (a developer) was emphatic in his response that he prefers and is comfortable working in the coding space. The other practitioner indicated her preference for working largely in the design space while the third, though comfortable in marginal exposure to either space preferred to work more in the design space.

This was consistent with the observations made about staff and students alike.

Personal journey

Each practitioner's recount of their personal journeys reflected how they arrived at their current point in their careers. While one has only ever been interested in practical and technology-type activities, another mentions that accessibility to education made the difference in assisting her to find her strengths. The third practitioner relates how having his own business at the start of his career stimulated his interest and comfort in working in both spaces.

The same variance in preferences for working in different spaces and the life choices made by our staff and students appears to align with what our seasoned graduates are saying. Other factors have emerged as well, which include access to the learning environment, engagement in the class and also in- and out-of-classroom factors which impact on the preferences of students but this is consistent with what the literature has revealed.

Gender

Two of the practitioners touched on gender and mentioned that the development environment is still perceived to be a largely male-dominated environment while **[P2]** advised that the perception, on her arriving in industry was that she wasn't meant to know technical aspects of the industry. This is an important consideration for our facilitators in that we would need to find ways in which we adequately address the issue.

4.7.11 WHOLE-BRAIN ATTRIBUTES

Perceptions about whole-brain

The perception by the practitioners is that people are born with innate skills and strengths so people like da Vinci are born with those traits but that it also depends on the stimulation and nurturing just how far one will progress.

There is an alignment with what the staff were saying and somewhat of an alignment with what most of the students were saying

Nature versus nurture

There was generally consensus amongst the practitioners that irrespective of what innate skills you enter the world with unless these are nurtured, they will not flourish. They also mention the importance of the limitations of preconceived stereotypical exposure based on gender and that this should be considered during the educational nurturing of students.

4.8 CONCLUSION

In this chapter, the five sets of data were presented from a descriptive analysis viewpoint.

The presentation and analysis of the education landscape revealed that there is a huge variation in the perception of what multimedia is and thus where it is placed in academic programmes. The focus varies from one institution to the next.

The analysis of CPUT's academic programme revealed that when only considering the exclusively multimedia offerings the programme appears to be skewed in the direction of design in terms of the way the curriculum is currently presented. What also emerged is that the technology subject is perceived to be lacking in engagement due to time constraints by staff and students alike.

The interview data revealed consistencies in perceptions about preference and comfort with working with design or technology but also raised potential areas for further exploration like gender and in- and out-of-classroom aspects which impact on student learning.

The summary of the findings with recommendations is presented in Chapter 5.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The aim of this research was to explore and interrogate the Multimedia curriculum and its facilitation at CPUT, the practice of Multimedia as a discipline in industry and to understand how the offerings at other institutions are interpreted and how they facilitate their programs. It was hoped that this interrogation and exploration would aid in understanding why there appears to be a perceived bias for either a left-brain or right-brain or whole-brain engagement by the learners, facilitators and practitioners. Through this study, I hoped to arrive at declarative statements towards a more holistic, whole-brain treatment of the curriculum at CPUT.

In this chapter, the research objectives are summarised, the literature survey is summarised as well as the methodology. The findings and potential contributions of the study and possible further considerations are also presented.

5.2 OBJECTIVES AND OVERVIEW

5.2.1 THE RESEARCH PROBLEM

We failed to understand how it is that learners within the Multimedia Technology programme appear to work anywhere across the technical-aesthetic design continuum. Since the programme draws upon design, creative and aesthetic areas of focus as well as requiring competence in more technical skills it appeared as if some students functioned well in one area and not another while others were able to function equally well in all areas. This has implications for how the curriculum is designed and also how facilitation is carried out.

5.2.2 THE AIM OF THE RESEARCH

The aim of this study was to understand why there is a perceived bias by students enrolled for the Multimedia Technology Programme towards either 'Design' or 'Technology' or in some cases why some learners appear to work equally well in both spaces. This understanding could potentially inform future curriculum and instructional approaches and move towards improving whole-brain engagement in academic engagement and therefore to inform multimedia practice.

The Research Question

Why does there appear to be a perceived bias by students for some subjects over others in the Multimedia Technology programme?

The research aimed to answer the following sub-questions:

Research sub-questions

1. How does Multimedia discipline present globally?
2. How do learners engage within the range of required skills within Multimedia training?
3. Why is it that there appear to be academic engagement preferences within the multimedia programme at CPUT?
4. How do staff and industry perceive students' capability to perform across the multimedia technical-aesthetic design continuum?

5.3 RESEARCH APPROACH, PARADIGMS AND METHODOLOGY

An interpretive approach was adopted as I intended to observe and attempted to interpret and understand the qualitative data collected.

Since an attempt was made to understand and explain a particular phenomenon with the view that it informs an improved approach to realising a more holistic learning environment, the study was interpretivist in nature. This paradigm makes the assumption that reality is multifaceted and subjective and informed by experience and human social context and is best understood within the context of the subjective experience (Bhattacherjee, 2012:103) and (Roode, 1993).

This appeared to align well with the objectives of the study as the perceptions, opinions and lived experience of the participants were relevant to the study.

An inductive approach was employed in interpreting the qualitative data sets for meaningful themes, recurrent concepts and relationships between the themes where present. Semi-structured questions were employed for the interview questions and as patterns appeared to emerge, a circular, iterative approach was used to refine the questioning.

The approach to the data analysis was iterative in that as each interview was held, and certain constructs and themes started emerging, these informed the questioning style for the subsequent interviews. Interviews were held and continued to be held until a sense of saturation was achieved.

The first interview was analysed and an open coding approach was used to make sense of the initial raw data. This informed the subsequent semi-structured interviews which were further analysed to improve the understanding of the raw data and this along with the previous interviews assisted in formulating more pointed questions

The documentary data sets were examined to collect and cluster information into themes as well.

The previous considerations are encapsulated in the research process flow diagram depicted in Fig 3.1.

5.4 SUMMARY OF FINDINGS

5.4.1 SUMMARY OF GLOBAL EDUCATION SECTOR SCAN

Twenty-three programmes located locally and abroad were investigated to understand what their interpretation of Multimedia is and how they structure their programmes. It was very evident that institutions across the sample set interpreted and thus presented their offerings across various disciplines. This variation in interpretation and, indeed, in the offerings in these suggests that the term “Multimedia”, while perceived to be an established discipline, appears to be not as well-defined as some other disciplines which leads to the variation in the types of offerings.

While a fair number of programmes were explored, perhaps in a different study, a larger sample would be required to understand more clearly whether there is a quantifiable interpretation of what Multimedia (and it’s facilitation) is and where to locate it as a discipline.

The results of the interrogation into the programmes globally led to the table shown in Chapter 4; Table 4.2.

Table 4.2 indicates the variance in offerings and in which discipline they reside and is suggestive of a possible continuum of potential offerings.

The following graphic might best describe the findings in the Industry sector scan.

Representing these findings graphically resulted in Figure 5.1 below.

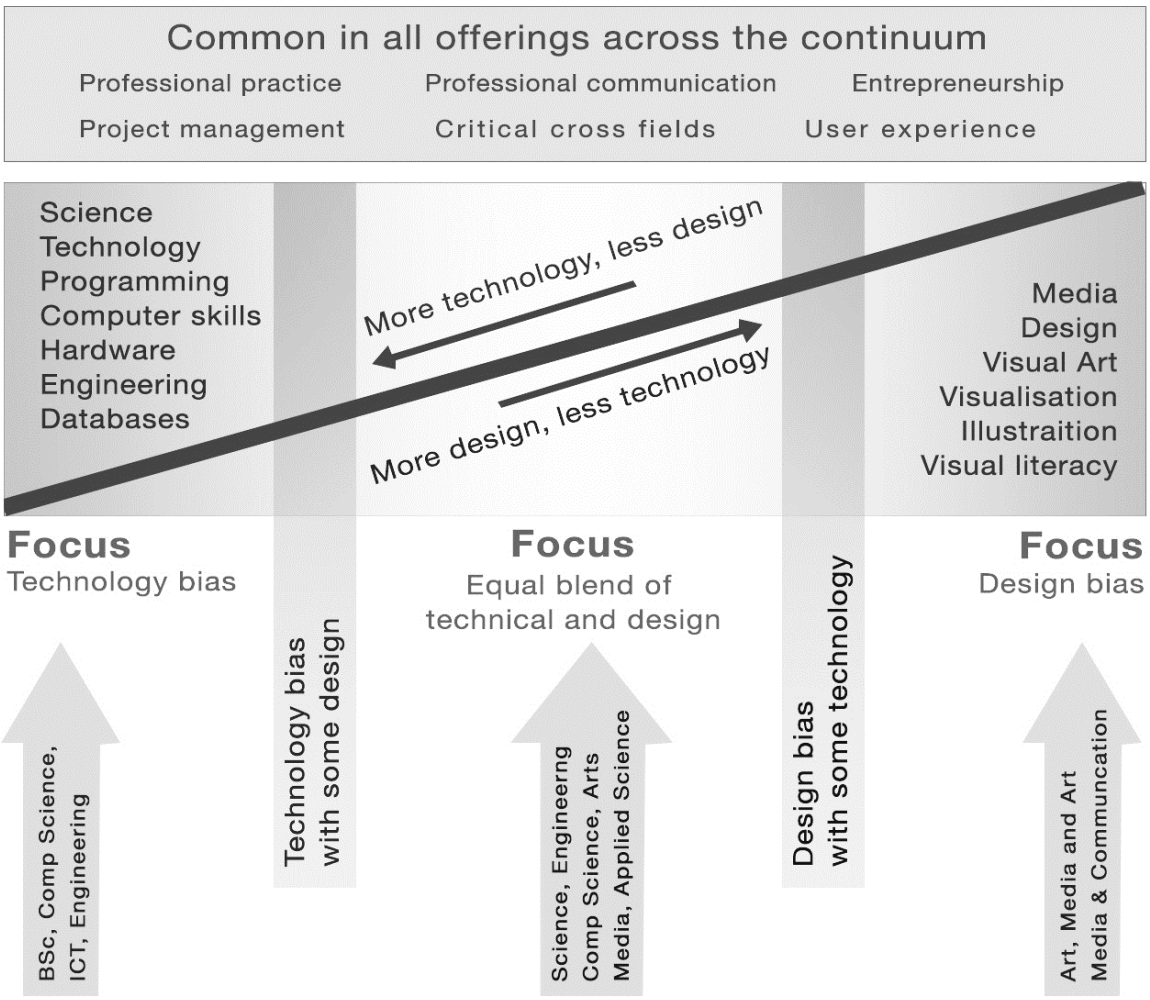


Figure 5.1: Graphic depicting continuum of academic offerings and focus of disciplines (Source: Author's own construct)

Figure 5.1 attempts to describe the location of programmes along a continuum where on one side (to the left), programmes that are strongly technical in their focus are located while on the opposite end of the continuum (to the right), programmes are focussed largely on design, art and aesthetics. The middle of the continuum represents an equal blend of technical and design elements.

What was observed is that there appeared to be a perceptible bias towards more technical and science-based disciplines in some cases and in other cases, the bias appeared to be leaning more towards the visual arts or arts in general. In some cases, too, programmes were located somewhere along the continuum between the two extremes. In some instances, even in the same institution, there were varying offerings of programmes in Multimedia – either located in purely science-based disciplines, art-based disciplines or somewhere between.

The study was not successful in identifying ‘why’ students have this preference but that the preferences exists is apparent from the study.

5.4.2 SUMMARY OF FINDINGS WITH THE MULTIMEDIA OFFERING AT CPUT

When the current academic offering at CPUT is examined (Table 4.4), it appears as if the focus is heavily technology-biased on the first year (Table 4.13) and so too for the second and third year.

However, when the current offering is examined to determine which are the multimedia-only subjects, the programme starts to present as if it is largely design-oriented with significantly less of the technology specifically related to multimedia being focussed on (Figure 4.3).

This apparent paradox emerged not only from examining the course documentation but also out of the interviews with the students and staff (discussed later). This is a cause for concern because, while the study aimed to consider potential preferences by learners to operate either in the design or technical space, the student responses and examination of the course documents revealed that perhaps, due to the lesser focus on the technology required for multimedia, this might have impacted on student preferences and comfort for either design or technology.

From examining the data extracted from the curriculum documents an attempt was made to represent the findings graphically. This is represented in Figure 5.2 below.

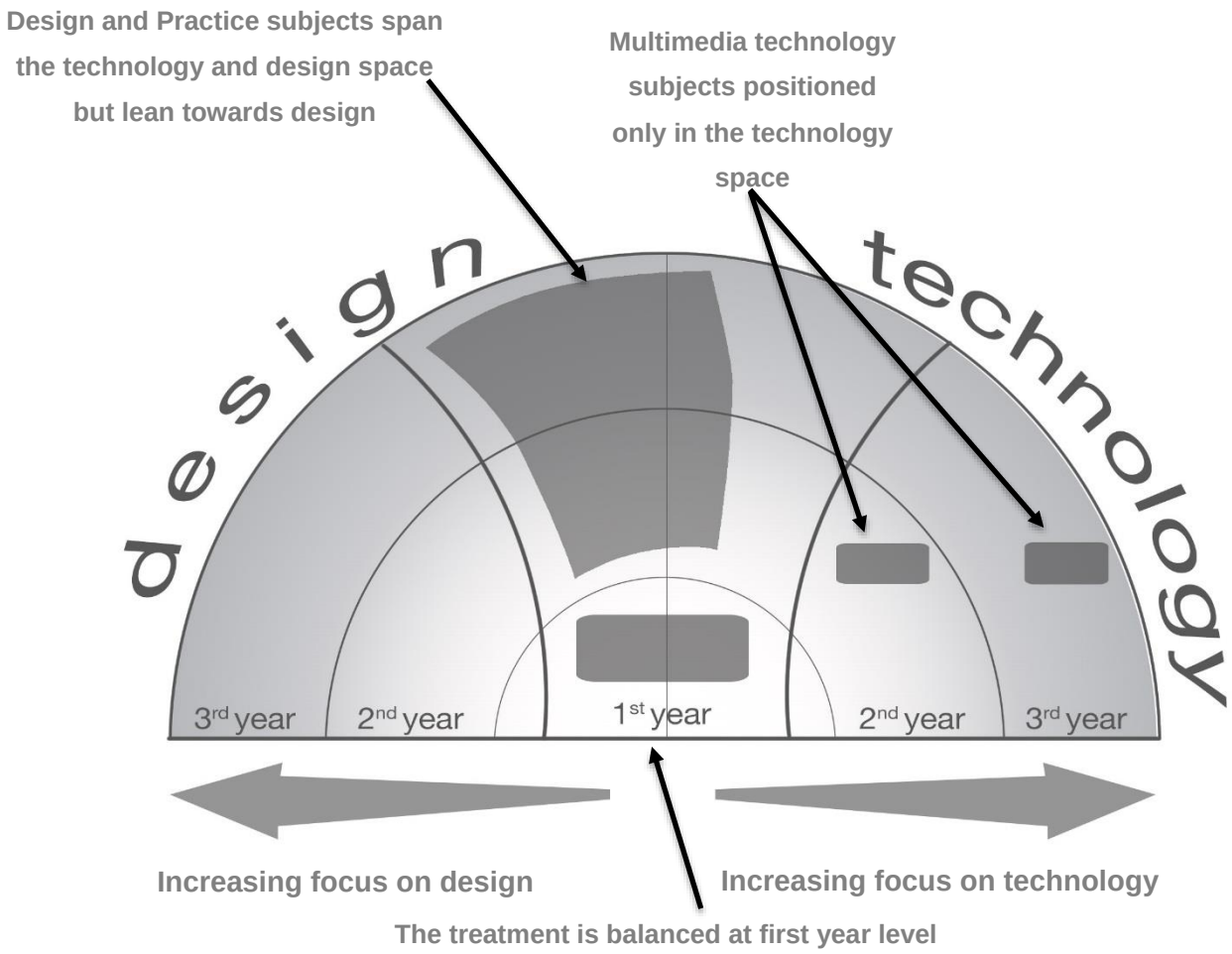


Figure 5.2: Graphic depicting the focus of the current curriculum for Multimedia Technology at CPUT (Source: Author's own construct)

What is being attempted via Figure 5.2 is to represent the preferences and, as discussed earlier, the subject focus in the current curriculum. The first year appears balanced across the design and technology spectrum but is narrowly positioned across the middle line. This is because the first year is common to all streams so excessive design or technology emphasis would not benefit the other streams. From second year onward, however, the technology subject is somewhat isolated and presented completely in the technology space. So too is the third year technology subject. The focus of the Design 2 and 3 and Practice 2 and 3 subjects as well as the Fundamentals 2 subject skews the focus more towards the design side of the spectrum. It does cross the midline somewhat to the technology side as some of the topics covered in these three subjects have elements of application where technology is required. It is important to note, too, that while the integrated project is meant to engage the learners in a manner such that they are exposed across

the spectrum, what has been observed is that there is more focus on the front-end design elements than there is on the backend and coding aspects.

5.4.3 SUMMARY OF FINDINGS FROM THE INTERVIEWS

Three sets of interview data were collected from students, staff and industry practitioners. Two of the industry practitioners are graduates of the Multimedia programme while the third had facilitated some of the offerings on the programme in 2001 and 2002.

The students and staff were presented with a typical scenario of a complete web design and development project (Appendix III). Given this typical scenario, questions were then posed in an effort to understand students' level of comfort with, and preferences for working in either the design space or the technical and coding space. Additional questions surrounded being exposed to the core competencies in either space as well as their views about being a specialist or generalist. Then, the concept of whole-brain engagement was explored since this had a direct bearing on the focus of the study.

The students', staff and industry responses are summarised as follows:

> **Preferences and comfort:** All the students indicated that they had a preference for working in the design space. One of the students indicated comfort in either space but a preference for design due to her finding the technology exposure lacking. Another student mentioned that she is comfortable and prefers working across the continuum. Students also mentioned the names of other students in the class who preferred only the coding and technical aspects of the course, rather than the front-end design.
>
> Staff agreed that students exhibit a preference and many report the technology subjects wanting due to the limited time they have with these subjects. Staff also indicated their own preferences and it was clear that they were either comfortable with design or technology but not both.
>
> The industry practitioners also supported the idea that students enter the industry with some form of preference even though they may start out wanting to be exposed to various aspects of the industry until they mature enough to find what which they wish to develop in. They also indicated their own preferences and comfort with working in some spaces over others.

Core competencies exposure:

The students were unanimous in the agreement that they should be exposed to, at least, the core competencies across the continuum as this has helped them to make informed choices about what they would like to focus on. They also mentioned that their perception of the industry is that they are required to function to some degree across the divide.

The views of the students were shared by the staff as well as the industry practitioners.

Specialist versus generalist focus:

The students were varied in their response to this question. Three students indicated immediately that they prefer to specialise where one indicated that a generalist approach initially will help him make better decisions about what to specialise in later. One student indicated her desire to be able to function in all aspects of the work environment.

The staff were all in agreement with a more generalist exposure to the environment so that, as students mature, they may make informed decisions but, as was shared by the industry practitioners as well, they invariably will find an area that they wish to specialise in.

Views about the current curriculum:

Students felt that within the department, there is a preference for supporting the Applications Development domain more than the other streams. They were also all concerned about the level of exposure to the technology aspects of the programme and felt that they did not receive enough exposure in this. They felt that the design aspects were covered adequately because there were three subjects which dealt with it in the second year and two subjects which dealt with design on the third year.

Staff, too, felt that the curriculum is well supported on the design aspects but mentioned requiring more time to expose learners to the fundamentals. They all reported that students felt that the technology subjects were not receiving adequate attention.

The industry practitioners (who had been exposed to a different balance in the curriculum while they were students) felt that the programme adequately prepared them for industry and was well balanced in its treatment.

Views on whole-brain attributes:

The students generally believed that a whole-brain person can be nurtured. Even though they showed preferences for the design on the whole, and mentioned others in the class who preferred development. Some mentioned that should the technology and development aspects of the curriculum be better supported, they would probably have been comfortable working in both spaces. More than one of the students mentioned **[S4]** as being someone they would call whole-brained.

The staff generally believed that people are born with innate abilities to function in a particular way but that the type of environment and the degree to which they are nurtured in an area dictates how they ultimately perform in that area. One of the staff members also referred to **[S4]** as being whole-brained.

The industry practitioners shared the view of the staff but also mentioned two of their classmates during their time at university who they described as being examples of whole-brain people.

Personal attributes and self-awareness:

While it was not the focus of the study, certain views emerged spontaneously out of the interviews. These related to students' self-awareness and personal growth. They mentioned that they had evolved quite significantly since starting out at university and that the engagement in the programme had assisted them to understand themselves better. They attribute much of their growth to the assistance and guidance received by the lecturers.

Other factors relating to in- and out-of-classroom influences also emerged during the interviews even though this was not the focus of the study.

Gender:

The influences of gender, too, was not the focus of the study but was mentioned as playing a significant role in how the female students (and industry practitioners) perceived the environment and also their level of comfort being in a field which is still perceived to be largely male-dominated.

What emerges from the interviews as well as the literature regarding preferences is that it appears that learners (and staff and practitioners), for the most part, appear to have a distinct preference for working somewhere specific across the design/aesthetic space to the development/technical and coding space. References have been made of a few individuals who are able to function well across the continuum.

If these preferences and comfort levels could be represented graphically, it could potentially present as in Figure 5.3.

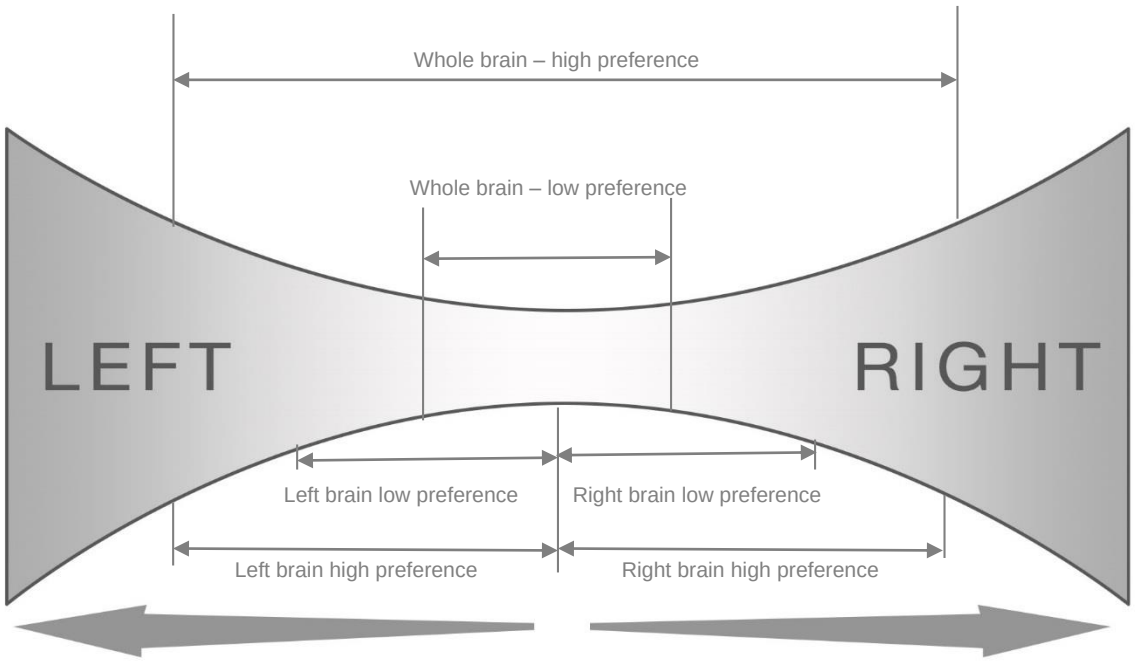


Figure 5.3: Graphic depicting the potential preference range of learners (Source: Author's own construct)

Figure 5.3 is an attempt to depict the comfort and preference levels of learners (and perhaps staff and industry practitioners as well). This is merely a proposition that emerges out of interviews and observation. It is meant as a metaphorical (and not a physiological) proposition. Metaphorically, Left indicates a preference for aesthetics and design work while the right represents preferences for development, technology and coding.

So it is possible that any of our learners, staff and practitioners could potentially reside at any location in the spectrum however, no one squarely sits in the extreme left or extreme right. There appears to be a leaning in either direction, either strongly so or moderately so. Only a few individuals appear to have the potential for spanning the divide equally.

5.4.3 IMPLICATIONS FOR THE CURRICULUM AND RECOMMENDATIONS

Figure 5.2 depicts the curriculum focus as it currently presents. If the aim is to produce more balanced, whole-brain approaches to the curriculum, then the slanting to one side will require attention if we are to improve student perceptions and experiences and engage them in a more holistic way. If this were to be done, then perhaps the arrangement would present differently. Figure 5.4 is an attempt at representing this proposed balanced curriculum.

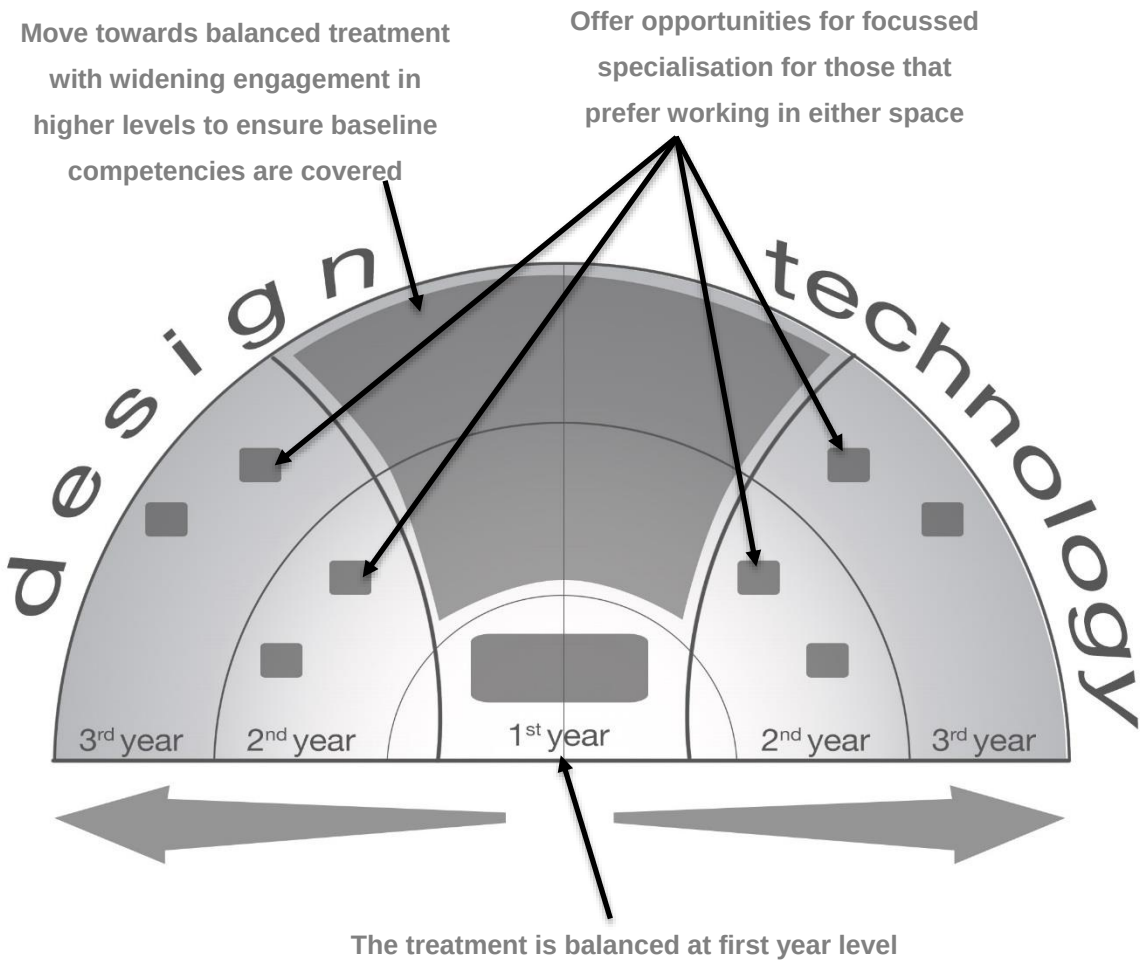


Figure 5.4: Graphic depicting a proposed change in focus towards a more holistic engagement. (Source: Author's own construct)

The proposal is that in order to encourage a more holistic engagement, the curriculum focus will require revision with a view of offering a balanced engagement. Perhaps narrower in the lower levels but widening in the higher levels but with offerings of electives dealing exclusively with design aspects and also those dealing with development and technology.

This way, all students are exposed to the required core competencies but have opportunities to develop their skills in their preferred areas of interest.

5.4.3 LIMITS OF THE STUDY AND RECOMMENDATIONS

The aim of this research was to determine if, indeed it is that our learners have a perceived preference for some areas of engagement over others and possibly why. It was hoped, too that this understanding would better inform instructional approaches with a view of a more holistic, whole-brain engagement to inform multimedia practice.

The study did not focus specifically on curriculum design based on the findings but rather to determine if there is a preference, then what possible implications for the future curriculum discussions and design might be.

No discussion about curriculum design can be undertaken without a firm grounding and understanding of the underpinning National Qualifications Framework's (NQF) guidelines of how curricula are required to be designed and the underpinning philosophies that guide the level descriptors which describe the nature of engagement with learners through the various levels. In order to advance the mandate of the NQF the South African Qualifications Authority as well as the other quality Quality Councils: The Council on Higher Education, Umalusi and the Council for Trades and Occupations (South African Qualifications Authority, 2012). The document continues to describe the philosophical underpinnings as well as the competencies and level descriptors: "The philosophical underpinning of the National Qualifications Framework and the level descriptors are applied competence, which is in line with the outcomes-based theoretical framework adopted in the South African context. 4. Ten categories are used in the level descriptors to describe applied competencies across each of the ten levels of the National Qualifications Framework: Scope of knowledge, Knowledge literacy, Method and procedure, Problem-solving, Ethics and professional practice, Accessing, processing and managing information, Producing and communicating of information, Context and systems, Management of learning, Accountability".

It was not the focus of this study to explore these dimensions but a potential future study could be to explore the implications of this study and future curriculum design.

If an attempt is made to draw from the findings of this study and what is being proposed in Figure 5.4 as well as what the level descriptors describe in terms of expected outcomes and levels of engagement as students progress through the levels, a possible academic engagement matrix could potentially present as in Figure 5.5 below.

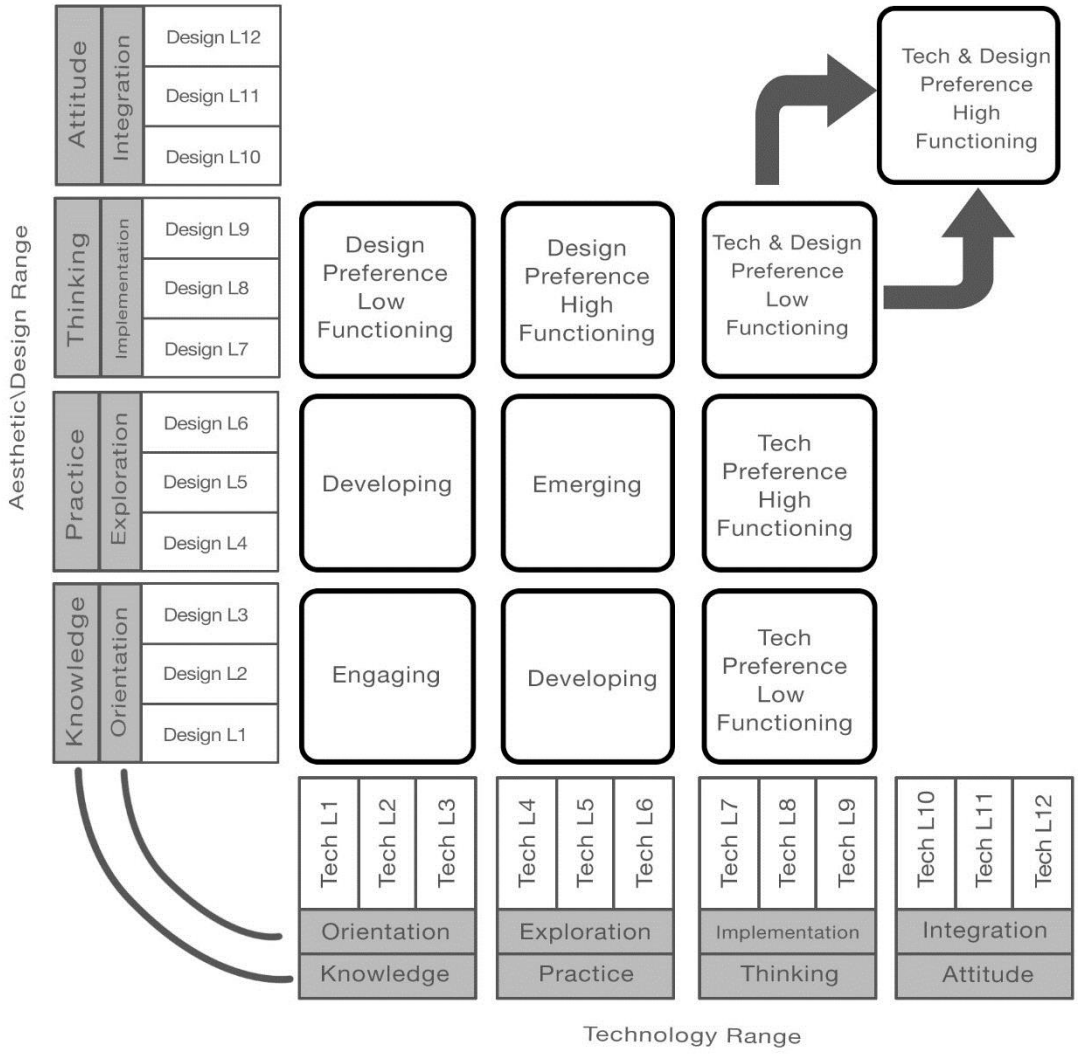


Figure 5.5: An academic engagement matrix towards whole-brain engagement (Source: Author's own construct)

As students enter the programme, they are essentially positioned in the lower-left area where orientation and knowledge are central to their engagement. The trajectory through the programme and levels is dependent on the type and level of engagement in the programme but also the students' own preferences. A student could essentially follow any one of the many possible paths, samples of which are shown in Figure 5.6.

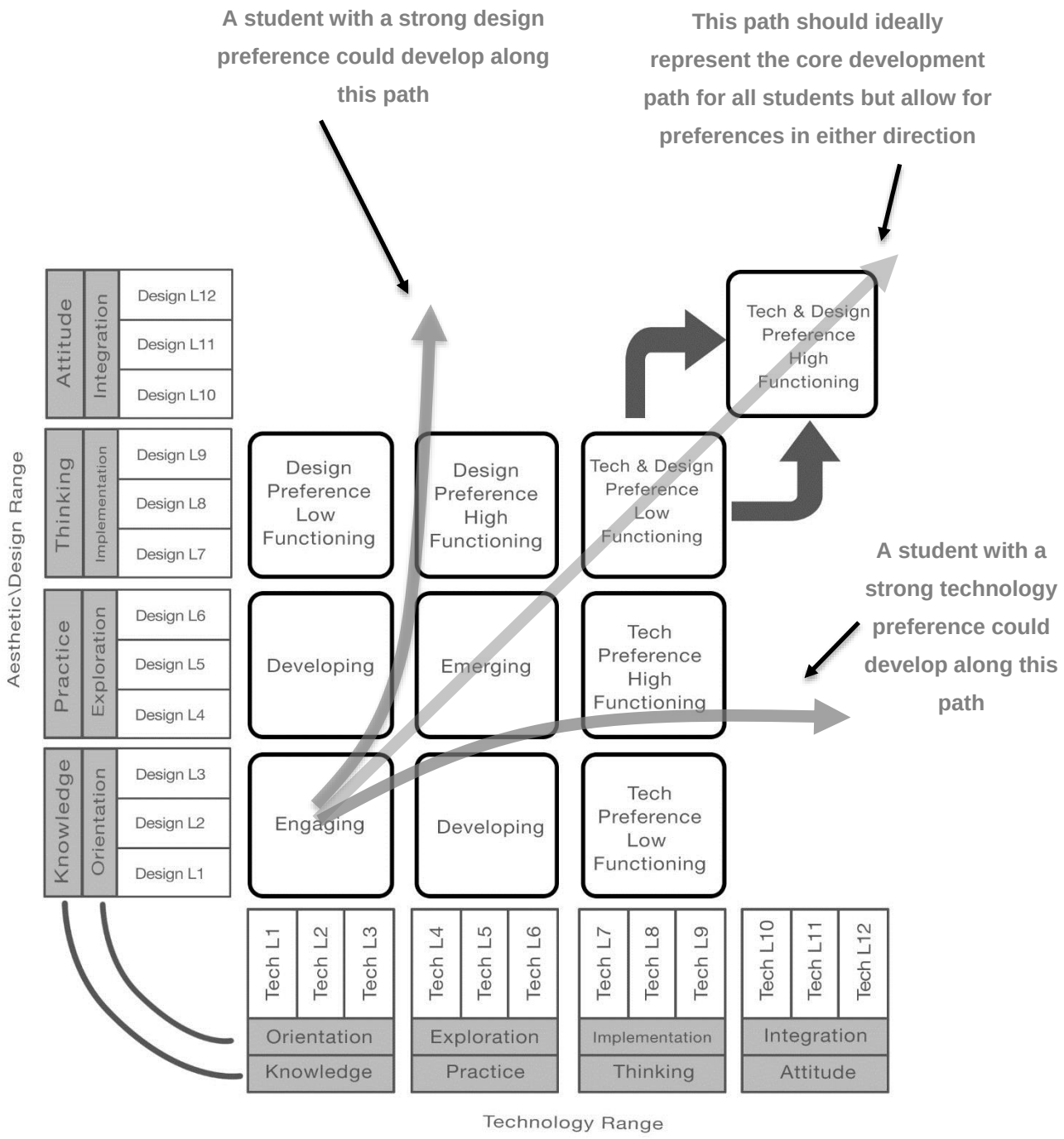


Figure 5.6: Examples of articulation paths for various students (Source: Author's own construct)

Figures 5.5 and 5.6 are merely suggestions for a possible point of departure for further exploration into considering instructional design approaches while keeping a holistic, whole-brain approach in mind and allowing for preferences to be catered for.

5.4.4 OTHER CONSIDERATIONS

The literature review revealed the existence of many models and theories about how students learn and there has been much research into this. Proponents and opponents of the various models and theories have presented their findings and this continues to add to our understanding of how students learn.

Evidence from the literature appears to suggest that brain-based approaches employed in action research type studies continue to grow and appear to suggest that these approaches are producing significant differences in the student learning experience.

In section 2.3, the influencers of learning (exogenous and endogenous) were briefly explored. What was excluded from this study was the exploration of the influences of these factors, including gender, on student perceptions and performance. This study revealed that these are potentially significant influencers of learning and which potentially warrants further study.

It appears that brain-based approaches are linked to the internal and external ecosystem of learners and that if we wish to improve the learning experience, these would need to be taken into consideration and integrated/embedded within the pedagogy.

The Herrmann model was used as a point of departure for providing context to the study largely because it spoke to preference which was the focus of the study.

What would be instructive as subsequent exploration would be to perform evaluations on a few students (and possibly staff and industry practitioners as well) using the evaluation instrument designed by Herrmann.

Perhaps the term multimedia needs to be revisited. Its wide interpretation is evident in the range of programmes it is located in across the globe. If we consider the intent behind the creation of media elements such as sound, video etc, we may arrive at the conclusion that it is to convey a message. Communicating in a form other than verbal might be central to the use of other media elements. If communication is central to the intent behind the production of media elements and how they are combined, then perhaps the term requires rethinking. A medium is used to convey a message. Light is used to convey images, static or otherwise and thus interacts with our visual sense. Air pressure waves are used to convey sound which interacts with our sense of hearing. Interactive media involves the sense of touch. So, too, does wearable smart sensors. So media conveyed through a medium in more than one form could be construed as multimedia. Recent interactive technology allows users to experience pressure (sense of touch) and even taste when interacting with devices; even remotely.

Though it is not the purpose and focus of this research, perhaps another study could explore the term in greater detail. Perhaps it should no longer be restricted to the use of only computers or electronic platforms.

Could multimedia then be thought of as: (a possible new definition)

‘Communicating (a message) with a user through the interaction with more than one sense by means of one or more forms of technology by digital and analogue means’

Or perhaps, simply:

‘Creative technology’

The very nature of the evolving term suggests that the incomplete understanding of what Multimedia is and how it is perceived and the impact of the various interpretations of its meaning have consequences for how it is curriculated and taught.

5.4.4 Concluding remarks

This study set out to attempt to arrive at an understanding as to why students prefer some subjects (be it largely design and aesthetics-related) as opposed to more technical aspects of the programme while a small number of people appear to be able to function comfortably across the divide. The study succeeded in showing that there is indeed a preference, a notable preference for either or both. Why this preference exists has yet to be discovered. Attempts were made to interrogate this herein but what is evident from the literature and indeed this study, is that we simply do not know. Attempts were made to ground the study in established conceptual and theoretical frameworks that have been the basis for research in this area. There appears to be some alignment with what this study revealed and some of the brain-based models are proposing. However, a more thorough investigation into possibly action research where some of these instruments are tested is advised to potentially further our understanding of student learning.

The ultimate objective was, having understood that these preferences exist, how do we leverage this understanding to improve our instructional approaches. Some proposals have been made in this chapter but they remain to be explored further.

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Appendix I – Industry Sector Scan

Industry Sector Scan

	Institution	Faculty/Department	Qualification	Year	Admission, Selection Criteria, Programme Outcomes and Subjects
	CPUT	Informatics and Design Department of Information and Communication Technology	National Diploma Multimedia Technology		Multimedia technology is a career-focused ICT specialisation course that enables students who achieve the qualification to, with some supervision and as part of a general team and individually, engage in a process where a static, dynamic and interactive multimedia presentation (either web-based, dedicated console application, media-specific such as CDROM or DVD or portable technology, audio or video) will be conceptualised, designed, planned, developed and published or produced The practictioner: Plans, designs and develops the production of digitally delivered information, promotional content, instructional material and entertainment through online and recorded digital media using static and animated information, text, pictures, video and sound to produce information and entertainment tailored to an intended audience and purpose. Web and multimedia development professionals combine design and technical knowledge to research, analyze, evaluate, design, programme and modify websites, and applications that draw together text, graphics, animations, imaging, audio and video displays, and other interactive media. Tasks include: Analyzing, designing and developing Internet sites applying a mixture of artistry and creativity with software programming and scripting languages and interfacing with operating environments

					Assisting in analyzing, specifying and developing Internet strategies, web-based methodologies and development plans Communicating with network specialists regarding web-related issues, such as security and hosting web sites, to control and enforce Internet and web server security, space allocation, user access, business continuity, web site backup and disaster recovery planning Designing and developing digital animations, imaging, presentations, games, audio and video clips, and internet applications using multimedia software, tools and utilities, interactive graphics and programming languages Designing, developing and integrating computer code with other specialised inputs, such as image files, audio files and scripting languages, to produce, maintain and support web sites They also create and manipulates computer animation, audio, video and graphic image files into multimedia programs to produce data and content for information kiosks, multimedia presentations, web sites, mobile telephone resources, electronic gaming environments, ecommerce and e-security solutions, and entertainment and education products. The practitioner also plans, produces and maintains web sites using web programming languages, software applications, technologies and databases together with specifications of user needs, often in conjunction with other ICT professionals such as business analysts, web designers and network and usability specialists. Entrance requirements:

					At CPUT, candidates for the Multimedia programme are selected based on their Grade 12 scores and a minimum points system. Specifically: Minimum admission requirements: A National Senior Certificate (NSC), as certified by Umalusi, with an achievement rating of 3 (moderateachievement: 40 – 49%) or better in four recognised NSC 20-credit subjects, and an achievement rating of 2 for Mathematics or Mathematical Literacy, and an achievement rating of 3 in the required official language at Home Language level, and an achievement rating of 2 in the other required language on at least First Additional Language level; one of these languages shall be English or Afrikaans. Specific programme requirements Required Senior Certificate subjects: Home Language 4 (50% – 59%), First Additional Language 3 (40% – 49%), (English or Afrikaans), Mathematics 3 (40% – 49%), Maths Literacy 5 (60% – 69%) (get reference off CPUT site) Duration: 3 years Career options: Html Coder / Developer, Internet Developer, Web Editor / Designer, Web Programmer Web Publishing Advisor, Website Architect, Website Developer, Digital Media Designer Instructional Designer, Interactive Media Designer, Multimedia Artist, Web Designer Multimedia Designer, Computer Games Programmer, Digital Media Specialist, Graphical Programmer, Multimedia Developer, Multimedia Programmer, Web Developer, Html Coder / Developer, Internet Developer, Web Editor / Designer, Web Programmer, Web Publishing Advisor, Website Architect, Website Developer, Data Administrator, Database

					Administrator, Multimedia Technician, Web Editor, Webmaster, Website Administrator, Website TechnicianSound Editor / Mixer / Recordist / Operator / Specialist, Sound Recording/Capturing adn Editing and Mastering, Video Production and Editing and Exporting Because of the entrepreneurship module introduced in the final year, a number of students work freelance or have founded their own companies.
				1	Multimedia Skills I Multimedia Applications I Multimedia Equipment I Multimedia Electrotechnology I
				2	Multimedia Design II Multimedia Technology II Multimedia Practice II Multimedia Informatics II
				3	Multimedia Design III Multimedia Technology III Multimedia Practice III with Industry Exposure Multimedia Informatics III
1	Tshwane University of Technology (TUT)	Faculty of The Arts Department of Visual Communication	National Diploma: Multimedia: Visual Arts-Biased		Admission requirement(s): A Senior Certificate or an equivalent qualification, with a pass in English. Recommended subject(s): Art and Design, Business Economics, Computer Studies. Selection criteria:

					All applicants are required to submit a portfolio. Detailed instructions and information will be provided. Based on the results of the portfolio assessment, successful applicants will be invited for an interview and language proficiency assessment Generic Outcomes: This course is specifically designed to enable artists to enter the interactive and animated digital world. This is a study field that, until recently, was mainly reserved for programmers and technically minded people. (source http://www.tut.ac.za/Prospectus/2015/faculties/arts.htm)
				1	First year of the National Diploma Graphic Design Progress to year 2 is based on performance in year 1 Communication Design I Design Techniques I Graphic Design Drawing I History of Art and Design I Professional Graphic Design Practice I
				2	Contextual Studies II Multimedia Design II Multimedia Technology II Professional Practice: Multimedia II Visualisation Techniques II
				3	Contextual Studies III Multimedia Design III Multimedia Technology III Professional Practice: Multimedia III Visualisation Techniques III

2	Tshwane University of Technology (TUT)	Faculty of Information and Communication Technology Department of Computer Science	National Diploma: Information Technology: Multimedia		National Senior Certificate (NSC) with a minimum of 40% in the language of learning and teaching of the higher education institution Admission requirement(s): A National Senior Certificate with an endorsement of a bachelor's degree or a diploma or an equivalent qualification, with an achievement level of at least 3 for English (home language or first additional language) and 4 for Mathematics. Applicants with a 3 for Mathematics or at least 5 for Mathematical Literacy will be considered for admission to the extended programme. Programme outcomes The objectives of the Multimedia programme are to provide – • the knowledge and skills required to become a multimedia programmer; • a foundation in the technical aspects of multimedia software development through knowledge of the fundamental areas of databases, data communications, multimedia systems and software development; and • the skills and knowledge to facilitate the development of different types of media, including 3-D animations and interactive simulations incorporating game engines and virtual reality. This qualification will equip students with the necessary skills to pursue a career in the design, implementation and maintenance of IT systems that make extensive use of multimedia. We focuson multimedia design, technology and programming. Source (http://www.tut.ac.za/Prospectus/2015/faculties/ict.htm)
				1	Computing Fundamentals Computing Systems Computing Skills

					Development Software
				2	Graphical User-Interface Design I Information Systems II Internet Programming II Multimedia Technology II Technical Programming I
				3	Industry Exposure III Multimedia Programming III Multimedia Design II Multimedia Design II
3	Tshwane University of Technology (TUT)	Faculty of Information and Communication Technology Department of Computer Science	National Diploma: Information Technology: Web and Application Development		National Senior Certificate (NSC) with a minimum of 40% in the language of learning and teaching of the higher education institution Admission requirement(s): A National Senior Certificate with an endorsement of a bachelor's degree or a diploma or an equivalent qualification, with an achievement level of at least 3 for English (home language or first additional language) and 4 for Mathematics. Applicants with a 3 for Mathematics or at least 5 for Mathematical Literacy will be considered for admission to the extended programme. Programme outcomes The purpose of this qualification is to equip students with the necessary skills to pursue careers in IT by creating, building, maintaining and managing web solutions. On completion of this qualification, students should be able to apply - • modern analytical and design techniques and methodologies in the development of IT software systems; • user-interface design principles; and

					• the appropriate software programming language and development environments to implement designed Internet solutions. This qualification focuses on website design and administration, and Internet programming by using various scripting languages and GUI programming environments.
				1	Computing Fundamentals Computing Systems Computing Skills Development Software
				2	Graphical User-Interface Design I Information Systems II Internet Programming II Technical Programming I Web Management II
				3	Industry Exposure III Internet Programming II I Web Management III
4	University of Johannesburg	Faculty of Art, Design and Architecture Department of Multimedia	National Diploma: Multimedia		Purpose of this programme Having obtained this qualification, students will be able to design and produce appropriate digital multimedia products with conceptual and technical content relevant to the formal market sector. AD2.2.7.2 Outcomes of the programme Exit level outcomes: a) Produce a range of digital animation, interactive and video outputs that conform to contemporary, professional and technical standards.

					b) Apply self-motivated, creative, problem-solving skills within the formal and informal sectors. c) Display a critical understanding of the relationship between contemporary sociopolitical/cultural forces and the self-motivated, creative production of multimedia products in a professional context. AD2.2.7.3 Admission requirements For applicants who completed the Senior Certificate in or before 2007: A Senior Certificate, or an equivalent qualification at an equivalent standard, as determined by a Status committee. A minimum M-score of 10 is required. For applicants who completed the National Senior Certificate in 2008: A National Senior Certificate (NSC) with a minimum APS-score of 20 with Mathematics or 21 with Mathematical Literacy and who fulfil the minimum rules of access, as stated in AD1: General Faculty (Phased out as part of national recurriculation exercise) Source (http://www.uj.ac.za/en/faculties/documents/fada-rules-and-regulations.pdf)
				1	Contextual Studies 1 Multimedia Design 1 Multimedia Technology 1 Professional Practice Multimedia 1 Visualisation Techniques 1
				2	Contextual Studies 2

					Multimedia Design 2 Multimedia Technology 2 Professional Practice Multimedia 2 Visualisation Techniques 2
				3	Contextual Studies 3 Multimedia Design 3 Multimedia Technology 3 Professional Practice Multimedia 3 Visualisation Techniques 3
5	University of Johannesburg	Faculty of Art, Design and Architecture Department of Multimedia	BA Design in Digital Media		Senior certificate or equivalent qualification with the minimum APS or M-score. • Submission of a prescribed portfolio once the application form has been processed. • Completion of the National Benchmarking Test (NBT) for Academic and Quantitative Literacy (AQL). A Bachelor of Arts in Digital Media Design prepares students to meet the needs of the digital age as designers of content, systems and products, where text, image, video, audio, graphics and animation converge. Starting from a generalised approach, students learn specialisations in interaction design or digital video. In Digital Media Design, students engage with and apply digital technologies innovatively, in order to design products to communicate and enhance life experiences. A range of technologies and products that students engage with include web sites, mobile applications, interactive games, design deliverables, music videos, digital video, motion graphics, short format animation, wayfinding systems and digital photography. The Department's facilities include four comprehensive computer

					laboratories with the latest high-end graphics computers, an audio recording suite an animation studio and a green screen studio Source (http://www.uj.ac.za/EN/Faculties/fada/departments/multimedia/Pages/default.aspx)
				1	In the first year of study, thinking and visualisation skills are developed. As in the graphics programme, attention is paid to research and drawing skills (source http://designcenter.co.za/programmes/multimedia-design/ba-degree-in-multimedia-design/)
				2	In the second year of study, the process of design problem-solving is extended to consider more carefully the relationship between the client, the message and the audience or end-user. Illustration, photographic and computer skills are taught to assist this structuring of meaning in practical projects. The subject of Critical Studies will introduce the student to visual cultural theory as it pertains to a study of diverse imagery in design. The intention is to enable critical thinking through focused reading and discussion around theoretical discourse
				3	In the third year of study, multimedia as a new tool for creativity is highlighted. The emphasis is on preparing students for the working world and the development of a professional portfolio. Students use specialized computer software packages to produce interactive design solutions and to add post production effects to video projects. The ability to evaluate theoretical and design arguments in the field of visual culture is fostered

6	University of South Africa	College of Human Sciences School of Arts Department of Art History, Visual Arts and Musicology Multimedia Studies	Bachelor of Arts (Culture and Arts) Multimedia Studies: Audiovisual Multimedia		Source (http://www.unisa.ac.za/default.asp?Cmd=ViewContent&ContentID=19768) (http://www.unisa.ac.za/contents/study/docs/CHS.pdf) A National Senior Certificate (NSC) (Degree endorsement) with at least 50% in the language of teaching and learning, or A Senior Certificate (SC) with matriculation exemption or qualify for the exemption from the Matriculation Board with at least a D symbol on HG or a C symbol on SG in the language of teaching and learning. Permission letter from the Department of Art History, Visual Arts and Musicology is required. Prospective students are required to submit a portfolio of artworks consisting of 4 drawings and 4 paintings or photographic/digital documentation thereof together with a completed questionnaire and record of personal details.
				1	Visual Literacy Introduction to Art History Fundamentals of Communication Computer Systems: Fundamental Concepts End-User Computing (Practical) Form and Motion Music and Society Two Dimensional Imaging Options (maximum 2) English Studies: Approaching Literature and Writing

					English Studies: Explorations in Reading and Meaning Visual Programming 1
				2	Integrated Organisational Communication Music Technology 1: Midi Visual Programming II Musical Entrepreneurship Writing Skills for the Communication Industry Visual Arts 1 Visual Arts 2
				3	New MediaTechnology Music Technology 2: Digital Audio Music in South Africa Sociology of Music Professional Multimedia Practice Visual Arts 3 Optional subjects (max 1) Media Studies: Content, Audiences and Production Exploring Information User Studies Investigating Information Ethics in the Information Era The Political Economy of Information
7	University of South Africa	College of Human Sciences School of Arts	Bachelor of Arts (Culture and Arts) Multimedia Studies:		Source (http://www.unisa.ac.za/default.asp?Cmd=ViewContent&ContentID=19768) (http://www.unisa.ac.za/contents/study/docs/CHS.pdf) A National Senior Certificate (NSC) (Degree endorsement) with at least 50% in the language of teaching and learning,

		Department of Art History, Visual Arts and Musicology Multimedia Studies	Computer-Generated Multimedia		or A Senior Certificate (SC) with matriculation exemption or qualify for the exemption from the Matriculation Board with at least a D symbol on HG or a C symbol on SG in the language of teaching and learning. Permission letter from the Department of Art History, Visual Arts and Musicology is required. Prospective students are required to submit a portfolio of artworks consisting of 4 drawings and 4 paintings or photographic/digital documentation thereof together with a completed questionnaire and record of personal details.
				1	Fundamentals of Communication Introduction to programming 1 Computer Systems: Fundamental Concepts End-User Computing (Practical) Form and Motion Visual Programming 1 Human-Computer Interaction 1 Two Dimensional Imaging Options (max 1) Visual Literacy Introduction to programming 2 English Studies: Approaching Literature and Writing English Studies: Explorations in Reading and Meaning
				2	Integrated Organisational Communication Programming: Contemporary Concepts

					Music Technology 1: Midi Music Technology 2: Digital Audio Structured Systems Analysis and Design Object-Oriented Analysis Business Management 1 Writing Skills for the Communication Industry Visual Arts 1
				3	Popular Visual Culture Media Studies: Content, Audiences and Production New Media Technology Databases II Advanced Systems Development Human-Computer Interaction II Professional Multimedia Practice Visual Arts 3
8	University of South Africa	College of Human Sciences School of Arts Department of Art History, Visual Arts and Musicology Multimedia Studies	Bachelor of Arts (Culture and Arts) Multimedia Studies: Multimedia in Digital Visual Arts		A National Senior Certificate (NSC) (Degree endorsement) with at least 50% in the language of teaching and learning, or A Senior Certificate (SC) with matriculation exemption or qualify for the exemption from the Matriculation Board with at least a D symbol on HG or a C symbol on SG in the language of teaching and learning. Permission letter from the Department of Art History, Visual Arts and Musicology is required.

					Prospective students are required to submit a portfolio of artworks consisting of 4 drawings and 4 paintings or photographic/digital documentation thereof together with a completed questionnaire and record of personal details.
				1	Visual Literacy Introduction to Art History Fundamentals of Communication End-User Computing (Practical) Form and Motion Business Management 1 Two Dimensional Imaging
				2	The Arts and Ideology 1 Visual Culture 1 Integrated Organisational Communication Graphic Processes Introduction to Entrepreneurship and Small Business Management Visual Arts 1 Visual Arts 2
				3	Art Theory and Criticism 2 Popular Visual Culture Contemporary International Art Media Studies: Content, Audiences and Production New Media Technology Music Technology 2: Digital Audio Professional Multimedia Practice Visual Arts 3

9	University of South Africa	College of Human Sciences School of Arts Department of Art History, Visual Arts and Musicology Multimedia Studies	Bachelor of Arts (Culture and Arts) Multimedia Studies: Visual Multimedia		A National Senior Certificate (NSC) (Degree endorsement) with at least 50% in the language of teaching and learning, or A Senior Certificate (SC) with matriculation exemption or qualify for the exemption from the Matriculation Board with at least a D symbol on HG or a C symbol on SG in the language of teaching and learning. Permission letter from the Department of Art History, Visual Arts and Musicology is required. Prospective students are required to submit a portfolio of artworks consisting of 4 drawings and 4 paintings or photographic/digital documentation thereof together with a completed questionnaire and record of personal details.
				1	Visual Literacy Fundamentals of Communication Computer Systems: Fundamental Concepts End-User Computing (Practical) Form and Motion Business Management 1 Two Dimensional Imaging Optional (max 1) English Studies: Approaching Literature and Writing English Studies: Explorations in Reading and Meaning Visual Programming 1
				2	Introduction to Art History The Arts and Ideology 1

					Integrated Organisational Communication Music Technology 2: Digital Audio Visual Programming II Visual Arts 1 Visual Arts 2 Options (max 1) Exploring Information User Studies Investigating Information Ethics in the Information Era Introduction to Entrepreneurship and Small Business Management Film, Literature and Society
				3	Visual Culture 1 Popular Visual Culture Media Studies: Content, Audiences and Production New Media Technology Professional Multimedia Practice Writing Skills for the Communication Industry Visual Arts 3 Options (max 1) Contemporary International Art Information and Knowledge Management The Political Economy of Information
10	University of Cape Town	The Centre for Film and Media Studies	BA in Film and Media Production: Digital Media		Applicants will not be admitted into the Film and Media Production specialisation in their first year. All intending F&MP students will register for the first year of a general Bachelor of Arts degree with double majors in Film and Television Studies and Media and Writing.

			and Informatics Stream		NOTE: If they wish to be admitted to the stream for Digital Media and Informatics, students should also register for one of the introductory Information Systems or Computer Science courses INF1002F/S OR CSC1017F in their first year. Final selection for this programme is made by a panel and only occurs in the second semester of the second year. The applicant's academic transcript indicating an average of at least 65% for the courses completed during the first year of study and include: Media and Society Analysing Film and TV AND, if they wish to be considered for the Digital Media and Informatics Stream: Information Systems I Python Programming for Engineers Writing and Editing in the Media, if applying to production courses in Print Journalism, Broadcast Journalism or Interactive Media, OR Introduction to History of Cinema, if applying to production courses in Screen Production or Screenwriting. And if in Digital Media and Informatics stream: Systems Analysis 2
				1	Analysing Film and TV Media and Society Options (at least 1) Information Systems I Python Programming for Engineers
				2	Writing and Editing in the Media Introduction to History of Cinema Options (max 1)

					Designing Online Media Print Journalism Production Screenwriting I Screen Production I Broadcast Journalism I Options (max1) Media, Power and Culture Television Drama: Theories and Genres Commercial Programming System Analysis Business Intelligence Principles Applying Database Principles Systems Design & Development
11	City Varsity School of media and creative arets	Private Institution			Diploma / Advanced Diploma in Multimedia Design And Production (http://www.cityvarsity.co.za/full-time-programmes.php?kid=0000000015)
					DIPLOMA IN MULTIMEDIA DESIGN AND PRODUCTION (2 years) The two-year Diploma Course in Multimedia Design involves work in many areas of graphic and new media design and equips students to become accomplished in the design and production of print media, web design and interactive media design. An optional and advised third year affords the opportunity to pursue an Advanced Diploma in Multimedia where students gain industry experience, work in a simulated creative

					agency and specialize in either digital design for print and interactive media or web application development for desktop monitors and hand-held/mobile devices ADVANCED DIPLOMA IN MULTIMEDIA DESIGN AND PRODUCTION (1 year) An optional third year affords the opportunity to pursue an Advanced Diploma in Multimedia Design and Production specializing in advanced level Digital Design for print, web and interactive media for desktop, tablet and mobile devices. Students will develop a conceptual approach to working with an advertising brief and will experience a design environment similar to that of an agency. Students will gain knowledge of branding, art direction, client service and interactive design during the course.
				1	During the first year of the Multimedia Design course, students are given a strong foundation in the principles of design. The emphasis is on paper-based design training to establish the skills required to translate a design brief into an effective piece of visual communication. Subjects throughout the year are: Graphic Design 1 Illustration 1 Digital Design 1 Contextual Studies 1 - Media Studies and Visual Literacy
				2	During the second year students hone their creative skills and produce projects that will form the basis of their digital CV and portfolio. Students work on interdepartmental projects learning to work with their colleagues as clients and also work on real industry

					projects where applicable. As part of the requirement for the completion of the course, students are spend two weeks in an agency/studio environment. The time allocated for this falls within the vacation periods and students find their own unpaid placement in a workplace of their choice. Subjects throughout the year are: Graphic Design 2 Digital design 2 Scripting for the Web 1 Contextual Studies – Visual Literacy 2, Media Law, Sound for MultiMedia, and Internship
				3	Projects undertaken during the third year of the Diploma course are of a recognized professional industry standard and where ever possible, incorporate real world working experience. The year covers: Graphic Design 3 Digital Design3 Contextual Studies 3 Electives Web and Mobile App Development Interactive Media
12	International				

	The Hague University of Applied Sciences	Academy of ICT & Media	Bachelor Degree: Communication & Multimedia Design		Communication & Multimedia Design CMD is a comprehensive, topical and interesting study programme in the field of design that offers a unique combination of interaction design, visual design, ICT, media and communication. The CMD student trains to become an interaction designer. This is a broad basic role within the context of digital interactive applications. A CMD student can specialise and become a user-experience designer, usability researcher, web designer, visual interface designer or front-end developer. An interaction designer designs an interface that ensures optimum interaction between people and systems. The design principles are based on user needs and the client's objectives, typically referred to as the business requirements. Duration: Four-year undergraduate programme Prerequisites: Knowledge of interaction design. Basic skills in front-end programming and visual design. English reading, writing and speaking proficiency. Basic skills in Photoshop and Illustrator. For students enrolled in: Interaction Design programmes Other study programmes focused on the development and production of digital media Modules: • Service Design: project that goes beyond interactive systems, with topics including design thinking, service design, new media and innovation. • Information Visualisation 2: time-based media, narratives, image editing, visualisation techniques, interface techniques.

					• Sustainable Design: designer responsibilities in creating new needs, making meaningful designs, contributing to a sustainable society through sensible designs. • Design Methods: organising design processes, collaborative design, design management. • Project: individual and autonomous design project, selecting a design problem, generating ideas, creating a concept, producing the concept, and testing, reflecting and evaluating. • Trends and Forecasting: media history and trends, media culture, communication in the 21st century. • Intercultural Innovation: design in an international context, intercultural aspects, visual culture. Learning outcomes: At the end of the semester, students have the following competencies and the ability to apply them independently in complex situations. • Look and listen: analyse and understand an assignment, define business goals and user needs, do contextual research. • Create concepts: create directions for design concepts, produce concepts. • Design details: design information architecture, interaction concepts, user interfaces, visual designs, prototypes. • Produce: produce a functional prototype, taking account of technical requirements and the context of the digital product. • Evaluate and test in all phases of the design process. • Choose an approach: choose method(s) and techniques for a user-centred design process, choose a project management method and reflect on the approach. • Gain insight into existing and new domains of application. • Function as a knowledge worker, applying research results and do practice-oriented research. • Take responsibility for self and others, define own ways of learning, social responsible conduct. • Function in different organisational contexts, navigate organisational structures, work in project teams. • Think and act as a designer.

					(source: http://www.thehagueuniversity.com/) and (http://www.thehagueuniversity.com/exchange-programmes/exchange-partnerships/exchange-ict-and-media/communication-multimedia-design) and (http://www.thehagueuniversity.com/xmsp/xms_itm_p.download_file?p_itm_id=86736)
13	The Hague University of Applied Sciences	Academy of ICT & Media	Bachelor Degree: Communication & Multimedia Design - User Experience		The Communication & Multimedia Design - User Experience programme fosters your user experience design and research skills as you learn how to create digital products and services. We offer an environment in which you are challenged to experiment with technology and research and try out new ways to create and evaluate experiences. You learn to research, design and create by combining academic content with hands-on practice. Over the course of this programme, you will develop into an inquisitive, critical designer capable of prototyping innovative concepts based on solid user research. Topics include: User Experience Design User Research Programming Prototyping Reflection on Values and Technology (source: http://www.thehagueuniversity.com/bachelor-studies/bachelor-degree-programmes/communication-and-multimedia-design/programme-feature)
				1	In the first year you learn the fundamentals of user experience (UX) topics (see below). There is ample room to learn, to discover and to experiment in order to acquire

					knowledge and skills. You finish the year with an inspiring project in which you apply what you have learned.
				2	In the second year you deepen your knowledge about UX, research and design. You acquire competences in collaboration with fellow students and professionals by working on projects and internships that deal with topics from industry or society.
				3	In the third year you can deepen or broaden your knowledge of a subject of choice by following a minor. You will complete the CMD-UX programme with a company-based graduation project integrating all aspects of UX research and design.
14	Saxion University of Applied Sciences	The School of Creative Technology	Bachelor of Science Bachelor in Art & Technology		Art & Technology is a course within the Creative Media and Game Technologies (CMGT) degree and is run by the School of Creative Technology (ACT) in the Applied Sciences field. On this course, you learn how to apply innovative techniques to create new forms of communication and subsequently develop interactive concepts. You take account of customer wishes while drawing on your own creativity as a specialism. Because as an Art & Technology student, you are - of course - creative. In addition you are curious, inventive and open-minded. Duration: 4 years Admission Requirements In addition to the general requirements, students need to submit an interactive portfolio (website, weblog, Flickr album or something similar) to prove your previously acquired technical skills and the ability to design. By means of an assessment (by telephone or via Skype) it will be established if your communicative skills are sufficient for admission to the course.

					(source: http://www.saxion.edu/site/programmes/degree/details/art-technology/bachelor-art-technology/) and (http://www.saxion.edu/wps/wcm/connect/4cda91ed-821e-4097-bf60-1b69e5256453/Art+%26+Technology+Brochure.pdf?MOD=AJPERES&CACHEID=4cda91ed-821e-4097-bf60-1b69e5256453)
				1/2	The first two years of your degree revolve around the topics of technology, design and content production. You learn about how the world of Art & Technology is structured, and you lay a broad foundation for the rest of your degree. As well as attending lectures and seminars, you also complete individual assignments and you do project work in groups. As early as in the first year, as much of your time as possible is spent tackling real-life assignments and issues from the industry. You are continually involved in devising, designing and developing interactive messages for specific users. Examples of subjects you can expect to cover in the first two years include: graphic design video production web technology 3D animation creative teamwork interaction design programming innovation & trends
				3/4	In the third year, you first do your internship and gain practical experience. You then do your minor. You can choose which minor you want to do, either a broadening or deepening in the area that interests you the most. You can also choose whether to do

					your minor at Saxion or at a different educational institute, either in The Netherlands or elsewhere if you prefer. In the final year of your degree, you specialise. This enables you to choose to focus on concept development, design or production of interactive media, for instance. You conclude your degree by doing a thesis. During the thesis phase, you devise, design and develop your own solution to a media-related (and often interactive-media-related) problem for a specific company or organisation. You do your thesis at a company of your choosing.
15	University of Greenwich	Science Department of Computing & Information Systems	Creative Digital Media, BSc Hons		This programme is designed for those who wish to pursue a career in the Creative Digital Industries and provides a strong grounding in digital media production with an emphasis on creativity and innovation. You will develop skills in visual design, storytelling, video production, animation, creative thinking, interface design and product development alongside an understanding of computing, digital technologies and programming. On achieving a set of base skills you will be encouraged to develop your understanding of digital media through the production of a series of practical projects that require you to adopt increasingly creative solutions and take on greater management of the process. You will also be able to develop a specialist skill in either 3D animation or digital television providing you with an entry point to a growth area of production. The final year project provides the opportunity to develop your skills in a specific area of digital media, creating a deep knowledge of a specialist area and seeing a product through from initiation to completion. Throughout the degree there will be opportunities for you to develop independent thinking, self-management, research and analytical skills,

					teamwork, and the ability to communicate confidently in a variety of forms appropriate to your chosen industry. The aims of the programme are: • To produce graduates that can understand and follow emerging technologies and creative practices in a broad range of digital media. • To make you aware of the technical, social, ethical and legal issues in product development and deployment. Entry Requirements A minimum of 280 UCAS points FROM subjects studied at A-level or equivalent qualifications PLUS GCSEs in English and mathematics at grade C or above, or equivalent qualifications. Duration: 3 years Professional recognition This degree is accredited by the British Computer Society (BCS). The programme can lead to full exemption from the BCS Certificate, Diploma, Professional Graduate Diploma and PGD Project, as well as partial Chartered Engineer (CEng) status. The programme also has accreditation from the European Quality Assurance Network for Informatics Education (EQANIE). Career options

					Graduates can pursue careers as interactive product designer/developer, interactive TV production, video editing, camera operator, 2D or 3D animator, creative account manager, web designer, games designer, graphic artist or postgraduate study. (source: http://www2.gre.ac.uk/study/courses/ug/mmd/g403)
				1	Digital Media Design Visual Storytelling Games and Interactive Systems Digital Media, Computing and Programming
				2	Digital Media Production Professionalism in the Digital Media Industries Installation Development Project Options from: 3D Animation with Post Production Design or Sound Design; Web Technologies
					Optional Sandwich Year (Work Placement)
				3	A substantial individual project on a topic chosen by the student One option from: Advanced Modelling & Character Animation or Transmedia Storytelling One or two options from: Digital Futures , Digital Creativity , Post Production Effects , Computing Education and Communication
16	University of Greenwich	Science Department of Computing & Information Systems	Digital Media Technologies , BSc Hons		This programme provides a strong grounding in digital media with an emphasis on creativity and innovation. You will develop an understanding of computing, digital technologies, programming and interactivity alongside skills in visual design, storytelling, creative thinking, interface design and interactive product development. On achieving a set of base skills you will be encouraged to develop your understanding of digital media

					through the production of a series of practical projects that require you to adopt increasingly creative solutions and take on greater management of the process. The final year project enables you to develop your skills in a key area of digital media creating a deep knowledge of a specialist area and see a product through from initiation to completion. Throughout the degree there will be opportunities for you to develop independent thinking, self-management, research and analytical skills, teamwork, and the ability to communicate confidently in a variety of forms appropriate to your chosen industry. The aims of the programme are: • To educate you in the theory, technology, practice and application of computing and the development of creative digital media • To ensure you can understand and follow emerging technologies in a broad range of digital media • To ensure you are fully aware of technical, social, ethical and legal issues in product development and deployment • To give you the skills to understand and display creative and innovative approaches to product development. Entry requirements Applicants should have: 280 UCAS points FROM subjects studied at A-level or equivalent qualifications PLUS GCSEs in English and mathematics at grade C or above, or equivalent qualifications Duration: 3 years

					Professional recognition This degree is accredited by the British Computer Society (BCS). The programme can lead to full exemption from the BCS Certificate, Diploma, Professional Graduate Diploma and PGD Project, as well as partial Chartered Engineer (CEng) status. The programme also has accreditation from the European Quality Assurance Network for Informatics Education (EQANIE). Career options Graduates can pursue careers as an interactive designer, developer, programmer, content strategist, web editor, web analyst, usability specialist, project manager, account manager, new business developer or postgraduate study. (source: http://www2.gre.ac.uk/study/courses/ug/mmd/g456)
				1	Visual Storytelling Games & Interactive Digital Media, Computing and Programming Digital Media Design
				2	Digital Media Production Installation Development Project Professionalism in the Digital Media Industries Web Technologies One or two options from: 3D Animation or Application & Web Development or Visual Application Development
					Optional Sandwich Year (Work Placement)

				3	A substantial individual project on a topic chosen by the student Digital Creativity Digital Futures One or two options from: Information and Content Management ; Development Frameworks & Methods ; Enterprise Web Software Development ; Information and Content Management ; User Interface Design ; Interaction Design ; Requirements Analysis ; Computing Education and Communication
17	University of Greenwich	Science Department of Computing & Information Systems	Games Design and Development , BSc Hons		This programme is designed for those who wish to pursue a career in computer game development and/or the emerging opportunities in developing gaming content for a wide variety of industries and media. As such it provides a strong grounding in computer game development and interactive media. The emphasis is on providing an all-round understanding of gaming and interactive techniques for a variety of platforms and contexts. On achieving a set of base skills you will be encouraged to develop your skills in, and understanding of, games design and development through the production of a series of practical projects that require you to adopt increasingly creative solutions and take on greater management of the process. The final year project enables you to develop your skills in a key area of games design and development creating a deep knowledge of a specialist area and see a product through from initiation to completion. Throughout the degree there will be opportunities for you to develop independent thinking, self-management, research and analytical skills, teamwork, and the ability to communicate confidently in a variety of forms appropriate to the games and creative digital media industries.

					The aims of the programme are: To produce graduates who are educated in the theory, technology, practice and application of computing and the development of modern computer games To understand and follow the emerging technologies in the computer games industry. Entry Requirements A minimum of 280 UCAS points FROM subjects studied at A-level or equivalent qualifications PLUS GCSEs in English and mathematics at grade C or above, or equivalent qualifications. Duration: 3 years Professional recognition This degree is accredited by the British Computer Society (BCS). The programme can lead to full exemption from the BCS Certificate, Diploma, Professional Graduate Diploma and PGD Project, as well as partial chartered engineer (CEng) status. The programme also has accreditation from the European Quality Assurance Network for Informatics Education (EQANIE). Career options Graduates can pursue varied careers in the entertainment and games industries. In addition, graduate positions such as multimedia specialists, video editors/producers,

					audio editors/producers, 3D/2D animators, web design and development roles and many other exciting areas within creative computing environments. (source: http://www2.gre.ac.uk/study/courses/ug/mmd/gg64)
				1	Digital Media Design Games and Interactive Systems Visual Storytelling Digital Media, Computing and Programming
				2	Digital Media Production Games Design and Development Professionalism in the Digital Media Industries Interaction Design Project One or two options from: 3D Animation ; Application and Web Development ; Visual Application Development ; Sound Design ; Object Oriented C++ Programming , C++ Game Programming
					Optional Sandwich Year (Work Placement)
				3	A substantial individual project on a topic chosen by the student Games Incubator Advanced Games Design and Development One or two options from: Artificial Intelligence; Digital Futures; Digital Creativity; Advanced Modelling & Character Animation, User Interface Design; Interaction Design; Computing Education and Communication
18	University of Greenwich	Science	Web Technologies , BSc Hons		The aim of this programme is to bring together the many areas that affect the design and development of web-based applications. This is a broad-based degree covering technical, theoretical and design areas. This programme provides a strong grounding in

		Department of Computing & Information Systems			web technology with an emphasis on creativity and innovation. You will develop an understanding of computing, web technologies, programming and interactivity alongside skills in visual design, storytelling, creative thinking, interface design and interactive product development. On achieving a set of base skills you will be encouraged to develop your understanding of web technologies through the production of a series of practical projects that require you to adopt increasingly creative solutions and take on greater management of the process. The final year project enables you to develop your skills in a key area of web technology creating a deep knowledge of a specialist area and see a product through from initiation to completion. Throughout the degree there will be opportunities for you to develop independent thinking, self-management, research and analytical skills, teamwork, and the ability to communicate confidently in a variety of forms appropriate to your chosen industry. The aims of the programme are: • To educate in the theory, technology, practice and application of computing and the development web sites and web based media • To understand and follow the emerging technologies in web and media development • To become fully aware of technical, social ethical and legal issues in web based product development and deployment. Entry requirements 280 UCAS points FROM subjects studied at A-level or equivalent qualifications PLUS GCSEs in English and mathematics at grade C or above, or equivalent qualifications.

					Duration: 3 years Professional recognition The programme has accreditation from the European Quality Assurance Network for Informatics Education (EQANIE) and the British Computer Society (BCS). Career options Graduates can pursue careers as web designer/developer, internet programmer, web animator, web master, e-commerce consultant, or postgraduate study in the area of their choice. (source: http://www2.gre.ac.uk/study/courses/ug/mmd/g420)
				1	Digital Media Design Visual Storytelling Games & Interactive Systems Digital Media, Computing and Programming
				2	
					Web Technologies Web Database Applications Database Applications Technologies Installation Development Project Professionalism in Digital Media Industries One or two options from: Application & Web Development , Visual Application Development, Digital Media Production

					Optional Sandwich Year (Work Placement)
				3	A substantial individual project on a topic chosen by the student Enterprise Web Software Development Information and Content Management One or two options from: Information Systems Management ; Digital Creativity; Digital Futures ; User Interface Design; Interaction Design; Information Technology Planning; Web Application Development; Service Orientated Web Applications; Computing Education and Communications; Computing Education Placement
20	University of Greenwich	Bachelor of Arts Department of Creative Professions & Digital Arts	Digital Arts Practice, BA Hons		With emphasis on exploring relationships between technology and creativity, this programme will appeal to those who are actively curious about things such as; art and design, video games, animation and video effects, smartphone apps, music technology. If you already make your own digital images, videos or music, or enjoy experimenting with creative software and hardware and want to find out how this can be applied to a career in the digital creative industries then this course is relevant to you. Throughout your degree, you will build a portfolio of work demonstrating the depth and range of your skills and abilities, often working collaboratively with other students on projects using creative development and project management skills commonly employed throughout the creative industries. The aims of the programme are: • To enable students to develop specialist skills including screen-based graphic and interaction design, animation and motion graphics, sound design, video production, interaction design for performance, physical interface design, and creative coding

					• To allow students to work innovatively with creative software and hardware, including devices such as Arduino and Xbox Kinect, and explore the creative potentials of consumer and professional level video and audio equipment • To offer opportunities for students to work alongside staff on university research projects • To prepare students for presentation of their work at end-of-year shows to which employers and other digital arts practitioners are invited and prepare for a range of careers across the creative digital economy at graduate level entry. Entry requirement 280 UCAS points OF WHICH 240 points or more from A2 or an equivalent qualification PLUS GCSEs to include English and mathematics at grade C or above. Duration: 3 years Career options: This programme is ideally suited to employment in creative industries such as; digital art and design, TV, radio, film, sonic arts, performing arts, music production, multimedia production, research, script and copy writing, print and online media. With courses that look critically at the creative industries, they will also have the relevant knowledge to work confidently in fields such as marketing and creative business management, or work as self-employed practitioners. The programme also caters for students intending to pursue teaching careers, particularly in subjects such as; media, creative production and design, and for those wishing to continue with post-graduate study. (source: http://www2.gre.ac.uk/study/courses/ug/med/p315)
				1	Compulsory:

					Creative Problem Solving Creative Coding Digital Arts & Visual Culture Students are required to choose one of: Portfolio Production 1 Fundamentals of Sound Recording Graphic Design Principles
				2	Compulsory: Digital Arts and Performance Interactive Story Production Students are required to choose 60 credits from this list of options. Documentary Practice (30 credits) Post Production Design (30 credits) Sound Design (30 credits) Datascapes (30 credits) Narrative & Sequence (30 credits) Contemporary Graphic Practice (30 credits) (30 credits) Interactive Art Project (15 credits) Creative Interaction (15 credits)
				3	Students are required to choose 60 credits from: Transmedia Storytelling (30 credits) Dissertation (CDA) (30 credits)

					Advanced Projects (60 credits) Students are required to choose 60 credits from: Creative Media Placement - Level 6 (30 credits) Working in Creative Industries (30 credits) Post Production Effects (30 credits) Transmedia Storytelling (30 credits) Advanced Sound for Image (30 credits) Web Standards Representation (15 credits) Being Digital (15 credits)
21	Brunel University, London	Department of Electronic and Computer Engineering	Digital Design BSc		Brunel's BSc in Digital Design is an updated programme that builds on our original Multimedia Design and Technology BSc – recognised as one of the first and most successful creative digital design courses in the UK This unique multidisciplinary degree focuses on the intersection of the arts and sciences. As a result of this vivid interaction, a stream of new ideas and new forms of creativity can be generated. Our courses combine ideas from digital technologies with those of creative design. This is an intensive, intellectually and creatively challenging programme with a very strong practical component. It is focused on giving you the knowledge and practical and analytical skills to prepare you for employment in creative roles within the digital industry. Aims

					The Digital Design programme aims to produce graduates who can make an immediate contribution to the digital media revolution, whether as employees, freelancers or entrepreneurs. You should be someone who appreciates the role of communication in human life; takes pride and care in how you organise and present your work, and is fascinated by technology and its creative potential. This degree is right for you if you are creative, intelligent and ambitious, and if you want to be part of the digital information age. The course assumes no specific educational subject background, but does require an interest in IT combined with creative design flair. Entry requirements: GCE A-level BBB, to include one creative subject such as Fine Art, Graphic Design, Music, Design and Technology (Product Design) or Photography and one technical subject such as Maths,Chemistry, Computing, Electronics, Statistics, Design and Technology (Systems and Control) or Physics. (General Studies not accepted). GCSE Mathematics grade C and GCSE English grade C are also required. Duration: 3 years Career options:

					Graduates from this course are often keen to build on their experience of computer technology and creative design skills by integrating aspects of IT, media, design, communication and engineering. The field of multimedia communication is developing rapidly and as a result newly emerging technology and skills are in demand. Previous students have become information architects, motion graphics designers, user experience architects, web designers/developers and digital managers. Companies which have employed Brunel Digital Design graduates include Warner Bros, Sky, BBC, Dare Digital, Lightmaker and IBM. Many work for highly creative, digital agencies with quite small employee numbers, while others work for departments within larger corporations. A number of students work freelance or have founded their own companies. (source: http://www.brunel.ac.uk/courses/undergraduate/digital-design-bsc) and (http://www.brunel.ac.uk/txp/pcc/students/what-do-brunel-graduates-do/school-of-engineering-and-design/multimedia-technology-and-design)
				1	Creativity for Digital Media Design Digital Photography Digital Graphics Web Design Business for the Creative Industries Programming for Digital Media 1 Introduction to Video Production Digital Design Theory

					Web Design & Development Interaction Design & Usability Programming for Digital Media 2.
				2	Applied Media Aesthetics 1 Marketing & Professional Development 3D Design Experimental Digital Futures Data Modelling Design for Mobile Applied Media Aesthetics 2 Design Practice 3D Animation Server–Side Web Development Mobile Development.
				3	Compulsory Working in the Creative Industries Major Project Options: Digital Experiences Sound Production for Mixed Media E-Business Graphics Rigging & Motion Capture 3D Stereoscopic Production

					Effects Animation.
22	University of Kent	School of Engineering and Digital Arts	Multimedia Technology and Design - BSc (Hons)		In current technology, communications, computing and entertainment have converged to create completely new media possibilities and experiences. These creative industries need people who can combine digital technology skills with creative ability to meet design challenges. Our multidisciplinary course in Multimedia Technology and Design offers the opportunity to develop in-depth knowledge in areas such as web development and design of interactive applications, as well as a broad grounding in digital photography, digital film-making, 3D modelling and special effects. Teaching in the School of Engineering and Digital Arts has been rated as excellent. The course is taught by a team of experts in design, animation, film-making, photography, web technology and programming. We have a team of senior industrialists who meet regularly with staff to review our courses, and there is an option to spend a year working in industry. Kent graduates in this field have gone on to work for organisations such as Disney, BBC and Framestore. Entry requirments: A level BBB GCSE C in Mathematics Duration: 3 years

					Career options: Our recent graduates have gone into computer-based training, web development, web mastering, multimedia authoring, television, film, electronic games, mobile communications, electronic commerce, internet publishing, multimedia marketing, computer programming and network management. Some have gone on to postgraduate study, such as our MSc in Computer Animation or Digital Visual Effects. (source: http://www.kent.ac.uk/courses/undergraduate/227/multimedia-technology-and-design-with-a-year-in-industry#!structure)
				1	Introduction to Programming Website Design Internet Programming with Java Visual Communication Digital Photography Digital Effects Moving Image Creativity in Interactive and Tangible Media
				2	Project Design Virtual Worlds and 3D Modelling Software Development Digital Portfolio Interaction Design Professional Practice
					Option: 1 year in industry

				3	Mobile Application Design Final Year Project 3D Computer Animation Pipeline Videogames Design Visual Effects and Compositing Managers and Organisations
23	Queen Mary University of London	School of Electronic Engineering and Computer Science	BSc (Engineering) (Hons) Multimedia and Arts Technology		These programmes cover fundamental aspects of the digital economy, creative multimedia production, multimedia social networks, computer-driven animation, multimedia scripting, interactive multimedia design, 3D graphics, web-based advertisement production, and management and planning of media assets. They emphasise computer systems, digital installations and software with a special focus on new media creation, and provide core knowledge of media production and multimedia system design. Graduates from these programmes will effectively combine technical and creative skills. The Industrial Experience option allows you to spend a year working in industry. Entry requirements: A levels Tariff/Grades requirement: ABB GCSE Maths grade B or above. Duration: 3 years Career options: Companies where our students have recently been placed include: IBM, Goldman Sachs, Kurtosys Systems, ITRS Group, Service Now, eBay, Microsoft, Cisco, Accenture, Bank of America, M&G Investments and Insight Software.

					(source: http://www.qmul.ac.uk/undergraduate/coursefinder/courses/80121.html)
				1	Professional and Research Themes Arts Application Programming Bridging Arts Technology Design Studio Introduction to Audio Introduction to Multimedia Fundamentals of Web Technology Design Studio Skills for Electronic Engineering and Computer Science
				2	Creating Interactive Objects Interactive Media Design and Production Group Creative Project Sound Design Select a stream from the following: Students must follow the same stream over semesters 3 and 4 Stream A (Technology): Website Design and Authoring Tools Options from: Software Engineering; Internet Protocols and Applications; Database Systems; Graphical User Interfaces

					Stream B (Geography/Media): Website Design and Authoring Tools; Society, Culture and Space; Graphical User Interfaces Stream C (Film: Production): Website Design and Authoring Tools Production Skills and one from: Software Engineering; Internet Protocols and Applications
				3	Project Interaction Design Digital Media and Social Networks Options from: Entrepreneurship in Information Technology Data Mining Computer Graphics Advanced Database Systems and Technology Sound Recording and Production Techniques Product Development C++ for Image Processing Artificial Intelligence Web Programming Bayesian Decision and Risk Analysis Creative Production

24	Queen Mary University of London	School of Electronic Engineering and Computer Science	BSc (Hons) Computer Science and Multimedia		This degree programme gives you a solid grounding in computer science with a specialised focus on multimedia. Multimedia, the use of graphics, animations, video and audio in a computer environment, is an expanding area in industry. The final year covers technical areas such as the delivery of multimedia content over the internet, and compression techniques, such as MP3 and 3D computer graphics. The programme also involves studying human factors in multimedia, including the principles for designing graphical user interfaces and the study of interactive systems. Entry requirements: A levels Tariff/Grades requirement: ABB GCSE Maths grade B or above. Duration: Career options:
				1	Procedural Programming Professional and Research Themes Computer Systems and Networks Logic and Discrete Structures Object Oriented Programming Introduction to Multimedia Fundamentals of Web Technology Information Systems Analysis Skills for Electronic Engineering and Computer Science
				2	Software Engineering Website Design and Authoring Tools Probability and Matrices

					Internet Protocols and Applications Software Engineering Project Operating Systems Database Systems Graphical User Interfaces
				3	Project Interaction Design Digital Media and Social Networks Options from: Entrepreneurship in Information Technology Data Mining Computer Graphics Advanced Database Systems and Technology Algorithms and Complexity Big Data Processing Embedded Systems Distributed Systems and Security C++ for Image Processing Artificial Intelligence Web Programming Communicating and Teaching Computing (UAS) Bayesian Decision and Risk Analysis
	End of Document				

Appendix II – Samples of Multimedia Programme Learner Guides

Cape Peninsula
University of Technology

FACULTY OF INFORMATICS & DESIGN

Diploma in Information & Communication Technology

MULTIMEDIA FOUNDATIONS: MUF152S

SUBJECT GUIDE:	2019
COURSE CODE:	MUF152S
NQF LEVEL:	5

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ORGANISATIONAL COMPONENT

1. INTRODUCTION

1.1 Significance of this Module

The **Multimedia Foundations 1** module provides an introduction to the various aspects of the multimedia field and industry. The module aims to inform the student on theoretical aspects as well as the practical implementation of each component and provide students with the ability to create evidence, including a brand pack, public service announcement video and website.

1.2 Student Participation and Requirements

Students are expected to engage in class lecture and practical sessions to ensure their understanding of the theoretical concepts and the application thereof. While the lecturers provide extensive notes, tutorials and projects to ensure that students are well-equipped, students are required to do extensive self-study. The onus is on students to liaise with their lecturers if they have any questions or are experiencing any difficulty during the programme.

2. GENERAL

2.1 Contact Information

DESIGNATION	NAME	LOCATION	TELEPHONE NUMBER	E-MAIL ADDRESS
Subject Co-ordinator	W. Koopman	Engineering 2.54	021 469 1042	koopmanw@cput.ac.za
	M. Hamman	Engineering 2.23 (5)	021 460 3836	hammanm@cput.ac.za
	W. Shaw			wayne.shaw@live.com
First Year Domain Co-Ordinator	E. Franke	Engineering 2.49	021 460 3685	franckee@cput.ac.za
Secretary	D. O'Brien			obriend@cput.ac.za

2.2 Class Times and Venues

CONTACT SESSION	VENUES	DAY & TIME
Lecture	Room 1.19	2 periods per week
Practical	Refer to timetable	2 periods per week
Consultation	Respective lecturer's office	By appointment ONLY

- Four periods per week have been allocated to this instructional offering.
- Attendance of lectures and practical sessions is compulsory.
- Two periods per week will be used for practical learning sessions, two period for a formal lecture and your lecturer will be available for consultation via appointment only.
- The practical session will give students an opportunity to engage with tutorials in an effort to learn the various software and apply these skills to completing assignments.
- Formal lectures will deal with the theoretical concepts of the course.

- Consultations with your lecturer to discuss specific concerns, problems areas or to seek individual advice can also be booked. No walk-ins allowed. **Book consultations by appointment at least 24-hours beforehand via email.**
- You are required to spend a substantial amount of time learning by yourself or with other classmates. To be successful in this subject, it is recommended that you spend the following amounts of time on these learning activities:
    - Self-study and independent research (+- 4 hours per week). Various weekly tasks will be set and you will be required to complete this either individually or as part of a group outside formal classroom time;
    - Use extensive learning resources which you are required to source using the institutional library and the Internet;
    - Actively participate in all classroom activities and develop your own insights, opinions, understandings and ideas.
    - Group and peer co-operation is seen as a vital learning strategy that you will be encouraged to develop and use.

2.3 Learner Management System (LMS)

The CPUT LMS MyClassRoom.CPUT.ac.za (Blackboard) is used extensively during this module and serves as the ONLY method of submission for ALL assignments. Assignment briefs will be made available via MyClassRoom.CPUT.ac.za. It is the student's responsibility to get thoroughly acquainted with this platform.

PLEASE NOTE: Submissions will ONLY be accepted via MyClassRoom.CPUT.ac.za

- **NO email submissions will be accepted.**
- **NO Google drive submissions will be accepted.**

3. STUDY MATERIALS AND PURCHASES

3.1 Study Material

- Access to a computer, the internet and, occasionally, a printer;
- Flash drive or of 32 gigs or larger;
- Headphones or earphones.

3.2 Recommended Readings

CPUT Library Resource: Books24x7

- **Typography Best Practices**, Smashing Magazine (ISBN:9783943075557)
- **Getting StartED Building Websites**, Alexander Dawson (ISBN:9781430225171)
- **Smashing UX Design: Foundations for Designing Online User Experiences**, Jesmond Allen and James Chudley (ISBN:9780470666852)
- **The Smashing Book #4: New Perspectives on Web Design**, Smashing Magazine (ISBN:9783944540603)
- **Creating Meaningful Websites**, Smashing Magazine (ISBN:9783944540368)

3.3 Websites

- http://www.htmldog.com
- http://www.w3schools.com
- http://tutsplus.com
- http://www.photoshopessentials.com

An extensive list will also be provided during the presentation of the various modules.

4. MODULE CREDITS

4.1 Planning of Time Allocation for Learning Activities

METHOD	% OF YOUR LEARNING TIME
Seminars / Practicals (face-to-face, limited interaction or technologically mediated)	30%
Independent self-study of standard texts and references and specially prepared materials (study guides, books, journals, using online tutorials etc.)	20%
Independent self-study, time needed to prepare for assessment (e.g. tests/exams)	25%
Student learning groups (working with your peers for group assignments)	25%

ASSESSMENT BREAKDOWN AND WEIGHTS

An average mark of 50% is required to pass each module. Students looking to pursue Multimedia on the second level must achieve a final year mark of 60% in order to qualify

ASSESSMENT CRITERIA	1ST TERM	2ND TERM	3RD TERM	4TH TERM		TOTALS
Will assessment be included in this term?	YES	YES	YES	YES		100%
Total assessment weight for the term	10%	20%	20%	25%	25%	
Will the assessment be moderated?	No	YES	No	YES		

STUDENTS WHO FAIL THIS SUBJECT WILL HAVE TO REPEAT THE SUBJECT THE FOLLOWING YEAR.

5. ETHICAL CONDUCT

5.1 Plagiarism

Plagiarism is both unethical and illegal and may be regarded as a criminal offence in terms of the Copyright Act 98 of 1978.

Plagiarism refers to the appropriation of the work or ideas of others. Plagiarism is an attempt to represent other person's ideas, expressions, artefacts or work as one's own.

Cutting and pasting from electronic sources into one's own document or design artefact, copying from the work of another student, overuse of sources and excessive paraphrasing are common forms of plagiarism in writing. Plagiarism can occur when the writer is unfamiliar with in-text and end-of-text referencing conventions and can be intentional or unintentional.

Additionally, plagiarism also takes the form of appropriating another's artistic work (e.g. photographs, logo design, website design, etc.) as one's own.

CPUT places a high premium on its academic standards and subscribes to a value system that requires strong action against plagiarism. Being regarded as a serious contravention of the University's rules, plagiarism can lead to expulsion from the University. No student shall plagiarise. If you are unsure, you can consult your rulebook for more information on the University's plagiarism policy.

6. ASSESSMENT

6.1 Assessment Policy and Regulations

In this subject different methods will be used to see the extent of what you have learnt from attending classes and engaging with the course content. Please refer to the 2019 student diary for the institution's policy concerning the conduct relating to student assessments, examinations and tests.

In the case of any alleged misconduct, disciplinary procedures will be instituted against the student. These rules/procedures are stipulated in the 2019 student diary. It is the student's responsibility to familiarise themselves with these rules.

- You will be asked to demonstrate your understanding of course related theory or apply your knowledge in a practical manner. You will demonstrate your learning on a continual basis i.e. through various written or practical tasks.
- All tasks or assessments will be awarded marks, and are designed to provide you with feedback. Feedback is meant to give you a better understanding of how well you are processing the subject content and how to correct, amend and improve on any weakness identified by your lecturer.
- Assessments will take the form of written assignments and essays, practical demonstrations of your understanding, oral presentations and group based projects. Your understanding and application of various concepts are vital, and not your ability to memorise facts, the assessment briefs and rubrics in this subject will help you to demonstrate this more effectively.
- You may be given the opportunity to complete your assessment individually, in pairs or in groups.

6.2 Briefs

All assessments be communicated to you via an assessment brief and a rubric.

- The brief will outline all the specifications and requirements for a particular assessment and it will also include an outline of the criteria by which your learning will be judged.
- The type of assessment you will be doing in each of the terms will be discussed with you in detail during a classroom session. The brief will be handed out to you at least two weeks before the assessment due date.
- Copies of all briefs will also be provided in a soft copy format via MyClassRoom.CPUT.ac.za.

6.2.1 Deadlines

Because the multimedia industry is deadline driven, it is very important that you learn to stick to deadlines. Thus, all assessment due dates in this subject are **NON-NEGOTIABLE.** The programme has specific penalties for the late submission of any task.

It is very important that you become familiar with those rules and consult your lecturer well ahead of time if there are any valid reasons why you might not be able to meet your assessment deadline.

Penalties for the late submission of tasks will be strictly enforced.

You will receive your completed assessment task along with feedback that will identify what you did well and where you need to improve within 14 days of submitting a task.

Any queries or concerns you have about a particular assessment or the mark assigned for an assessment must be discussed with the lecturer concerned within five days of receiving your feedback and marks.

6.3 Assessment Related Queries

Any queries or concerns you have about a particular assessment or the mark assigned for an assessment must be discussed with the lecturer concerned as soon as possible after you have received your feedback and marks. Queries regarding marks will not be entertained beyond two weeks after receiving your marks unless a valid reason is communicated/submitted (e.g. medical certificate, etc.).

6.4 Absence for a Test/Examination/Presentation

If a student is unable to write or be present at a scheduled test/examination/presentation, they must notify the concerned lecturer ahead of the scheduled assessment (e.g. if a student is sick, experienced a traumatic event, etc.). Only valid and reasonable grounds will be regarded as acceptable and where applicable, supporting documents must be produced. At the discretion of the lecturer, a re-test or any other form of assessment may be scheduled. If a student misses a scheduled test/examination without informing the lecturer, they will get a zero (0). The onus is thus on the student to keep the lecturer concerned informed in the event of them not being able to sit for a test/examination.

6.5 Assignment Submission Details

ALL ASSIGNMENTS MUST BE HANDED IN, IN DIGITAL FORMAT.

- **ELECTRONIC ASSIGNMENTS:** ALL assignments are to be submitted via MyClassRoom.CPUT.ac.za **ONLY**, before or on a specific due date and time. Once submitted, it is the onus of the student to ensure that the lecturer did in fact receive their hand-in.
- **LATE HAND-INS OF ASSIGNMENTS:** The submission of late hand-ins of assignments will not be tolerated. In the event of a late-in, the student will be penalised and marks **will be deducted**. Late assignments will be decreased by **10% per day** for each day past the due date, but not exceeding three (3) days. In the event of submission being more than three days late, the student will get **zero (0)**. **Valid reasons** must be timeously communicated to the lecturer in order to avoid the afore-mentioned penalty. The student can make contact with the lecturer via e-mail or in-person explaining the reason for the late hand-in (and where applicable, submit supporting documents). On the discretion of the concerning lecturer, the lecturer may allow an extension.
- **REFERENCING:** To prevent any incidence as mentioned in 5.1 above, it is imperative to reference your source(s). **Harvard referencing for beginners.**

It is recommended that the student makes use of **academic journals** and **textbooks** and does not solely rely on websites. The institution's library offers a wide range of services, hosting various article databases, Government publications, etc. This information is readily available under the library link on the CPUT website.

EXAMPLES OF THE HARVARD METHOD:

IN-TEXT REFERENCING	END-OF-TEXT REFERENCING
According to Guirdham (1995:439), constructive conflict can lead to creative solutions to problems and force people to tackle socio-emotional issues.	People often react to conflict by suppressing it, usually to avoid confrontation (Folger, Poole & Stutman, 1993:4).
Kreitner and Kinicki (2007:192) define job satisfaction as an "effective or emotional response toward various facets of one's job" and as such derive from a combination of factors.	Buitendach and De Witte (2005) assert that there are two main types of factors that influence job satisfaction, namely extrinsic and intrinsic factors (cited in Josias, 2005:53).
BIBLIOGRAPHY Sources used in the text must appear in the bibliography. The bibliography must be listed in alphabetical order. Refer to the Harvard referencing guide for examples.	

6.6 Assessment Opportunities: Administration

- The nature of your assessment will be communicated to you via an assessment brief and a detailed rubric.
- The brief will outline all the specifications and requirements for a particular assessment and it will also include an outline of the criteria by which your learning will be judged.
- The type of assessment you will be doing in each of the terms will be discussed with you in detail during a classroom session, normally at the start of a new topic. The brief will be handed out to you at least two weeks before the assessment due date.

7. GENERAL NOTES: ASSIGNMENTS

7.1 Format and Editing

Formatting and editing is important in order to present quality work. Adhering to the stipulated guidelines also results in uniformity and it allows students to practice for future industry standards and academic related work. Finally, poor and inconsistent formatting, grammatical and spelling mistakes will result in poor marks.

- Only use **12pt**, **Calibri, Cambria, Century Gothic, Verdana, Tahoma or Arial** for your assignments.
- Always **proof read** your work before handing in any written assignment/project/essay. If you are not proficient in English, get assistance from someone who is more proficient in the English language.
- Always use the **spell checker set to UK English**. You will lose marks unnecessarily if there are obvious spelling errors.
- Avoid using **very long sentences**. This can potentially lead to misinterpretation and poor clarity.
- The **flow of ideas** and information needs to be logical and systematic.
- **Page numbers** must always be added.
- **NO "fancy" fonts.**
- **Use 1.5 line spacing** for all typed and printed submissions.
- **Use headings where necessary.** Main headings should be bold and in capital letters, sub-headings in bold. Ensure that you number the headings correctly.

STUDY COMPONENT

8. MODULE SPECIFICATIONS

8.1 Purpose of the Module

The Multimedia Foundations 1 module provides an introduction to the various aspects of the multimedia industry. The module aims to inform the student about the theoretical aspects as well as the practical implementation of each component, and providing the students with the ability to create evidence that can be integrated into a web production that includes multimedia from varied sources.

8.2 Module Structure

TERM	THEME/TOPIC	SPECIFIC OUTCOMES
Term 1 Week 1	Introduction to Multimedia Introduction to Visual Literacy	Define multimedia and discuss web-based categories. Discover career opportunities in the multimedia domain. Define visual literacy and understand its significance in multimedia. Understand and analyse the subject matter and interpret the meaning of images.
Term 1 Week 2	Multimedia Elements: Typography	Learn about different font classifications and styles. Understand why it is important to use different fonts in different mediums. Analyse how different fonts create emotions toward the content and layout.
Term 1 Week 3		
Term 1 Week 4	Multimedia Elements: Graphics | Colour | Composition	Understand the concepts and laws regarding copyright. Understanding the different colour models: RGB, CMYK, and HSB. Recognise colour theory terms and concepts. Understand the difference between painting and drawing programs. Identify different file types and analyse which graphic file types are used in various instances. Understanding how composition of photographs and materials communicate.
Term 1 Week 5		
Term 1 Week 6	Introduction to Branding & Design	Understand the basic various principles of branding and graphic design.
TEST WEEK		
RECESS		
TERM	**THEME/TOPIC**	**SPECIFIC OUTCOMES**
Term 2 Week 1	Branding & Design	Discuss the differences and similarities between print and digital design. Understand the importance of adjusting the font size, spacing, colour, line length, and alignment of text.
Term 2 Week2		Apply the principles of design and layout for print by creating a poster/flyer/newsletter. Create a brand with accompanying logo and brand guide.
Term 2 Week 3		
Term 2 Week 4		
Term 2 Week 5	Storytelling: Video	Discover the principles of storytelling. Learn about the traditional three-act structure. Learn how to apply storytelling and the three-act structure. Create a script.
Term 2 Week 6		Discover what a storyboard is and how it relates to the storytelling and video production process. Create a storyboard based on the script.
Term 2 Week 7		

TEST/PROJECT/SICK TEST WEEK		
VACATION		
TERM	**THEME/TOPIC**	**SPECIFIC OUTCOMES**
Term 3 Week 1	Storytelling: Video	Discover the video production processes. Learn how to apply the planning documents for each video production process in order to create a video.
Term 3 Week 2		Edit the video content; add sound, animation, graphics and typography to the production.
Term 3 Week 3	Website Planning and Structural Design	Understand design strategy. Define and create planning documents.
Term 3 Week 4		Understand and implement organisational structures within planning.
Term 3 Week 5	Web Design and Strategy: Concepts of UI & UX	Investigate and understand concepts of website navigational structures. Produce a persona based on the provided target market case study.
TEST/PROJECT/SICK TEST WEEK		
RECESS		
TERM	**THEME/TOPIC**	**SPECIFIC OUTCOMES**
Term 4 Week 1	Web Design and Strategy: Concepts of UI & UX	Understand design guidelines for appearance and interactivity. Create wireframes, storyboards and site planning documents.
Term 4 Week 2		
Term 4 Week 3	Web Design and Development: HTML5 & CSS3	Apply the rules and concepts of usability to create a fully functional professional portfolio website.
Term 4 Week 4		
Term 4 Week 5		
Term 4 Week 6		
TEST/PROJECT/SICK TEST WEEK		
VACATION		

8.3 Articulation with Other Modules in the Programme

This module links in with the other modules in the year group to help students to develop a more complex understanding of the role of multimedia in a working world. This understanding calls on the ***SOLO taxonomy.***

The SOLO taxonomy stands for: **S**tructure of **O**bserved **L**earning **O**utcomes.

It describes levels of increasing complexity in a student's understanding of a subject through five stages, each of which embraces previous levels, but adds something more:

1. **Pre-structural:** students simply acquire unconnected information, which have no organisation and make no sense.
2. **Unistructural:** simple and obvious connections are made, but without their significance being understood.
3. **Multistructural:** a number of connections may be made, but the meta-connections between them are missed, as is their significance for the whole.
4. **Relational** level: the student is now able to appreciate the significance of the parts in relation to the whole.
5. At the **extended abstract** level, the student is making connections not only within the given subject area, but also beyond it, able to generalise and transfer the principles and ideas underlying the specific instance.

8.4 Learning Presumed to Be in Place

General abilities to collect, analyse and organise information of a visual and graphic nature. You are expected to have a basic ability to construct ideas in a logical way, and the ability and desire to be able to look at various social, practical and aesthetic problems from a number of different angles.

8.5 Critical Cross-field Outcomes

The critical cross-field outcomes include, but are not limited to the following in the context of digital creative technologies and multimedia:

- Identifying and solving problems by using critical and creative thinking.
- Working effectively with others as a member of a team, group, organisation, community.
- Organising and managing oneself and one's activities responsibly and effectively.
- Collecting, analysing, organising and critically evaluating information.
- Communicating effectively using visual and language skills in the modes of oral and written persuasion.
- Using science and technology responsibly, effectively and critically, showing responsibility towards the environment and health of others.
- Demonstrating an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
- Contributing to the full personal development of each learner and the social and economic development of society at large by making it the underlying intention of any programme of learning to make an individual aware of the importance of:
    - reflecting on and exploring a variety of strategies to learn more effectively;
    - participating as responsible citizens in the lives of local, national and global communities;
    - being culturally and aesthetically sensitive across a range of social contexts;
    - exploring education and career opportunities;
    - and developing entrepreneurial opportunities.

9. STUDY UNITS/STUDY THEMES

9.1 Specific Outcomes

STUDY UNIT OUTCOMES			
UNIT 1: THEORY	Introduce the theoretical aspects of the multimedia components (graphics, typography, branding).	Problems to do in class; group discussion in class; homework tutorials on problems.	**A formal online exam covering topics discussed and engaged with in class**
UNIT 2: PRACTICAL APPLICATION OF THEORY	Discuss branding and design.	Problems to do in class; group discussion in class; homework tutorials on problems.	**Create a brand identity for a client with supplementary marketing material in print and digital formats.**
	Discuss the story-telling process.		**Create a script and storyboard. Put together a video clip using editing software.**
UNIT 3: PRACTICAL APPLICATION OF THEORY	Introduce students to usability, UX and UI design. and web design standards	Problems to do in class; group discussion in class; homework tutorials on problems.	**Create a website using the planning tools discussed in class.**
UNIT 4: PROFESSIONAL PORTFOLIO	Utilising the year's knowledge and experience, students will create a professional portfolio based on their desired career path.	Problems to do in class; group discussion in class; homework tutorials on problems.	**Design and develop professional portfolio website.**

9.2 Assessment Opportunities

In this subject different methods will be used to see the extent of what you have learnt from attending classes and engaging with the course content.

- You will be asked to demonstrate you understanding of course related theory or apply your knowledge in a practical manner. You will demonstrate your learning on a continual basis i.e. through various small written or practical tasks.
- Some of these tasks or assessment will be awarded marks, while others are designed to provide you with feedback. You can use the feedback you received to understand how well you are learning the subject content and how you can improve on any weakness identified by your lecturer.
- Assessments will take the form of written assignments and essays, practical demonstrations of your understanding like when designing a website or an image, oral presentations, take home exams and group based projects. Your understanding and application of various concepts are seen as most important and not your ability to memorise facts, the assessments in this subjects will therefore help you to demonstrate this more effectively.
- You may be given the opportunity to complete your assessment individually, in pairs or in groups.

9.3 Assessment Criteria

Assessments will be graded against criteria applicable to problem solving assignments:

THRESHOLD	GOOD	EXCELLENT
Problem solving approach		
Basic actions to achieve solution identified. Implications of actions not always considered. Some unrealistic expectations.	Actions identified are realistic and sufficiently detailed. Thought is given to implementation.	Evidence of pro-active planning, i.e. all implications anticipated and considered.
Solutions suggested indicate limited understanding of problem. Only typical solutions proposed or existing solutions copied. Constraints tend to limit possible solutions.	Typical and new solutions proposed through idea generating processes. Adapting of existing solutions	Solutions show innovative approach to problem Solutions show integration and transfer of knowledge between problems. Building on from existing solutions. Unlike threshold, constraints used to innovate.

9.4 Self-study Activities

- Various weekly tasks will be set and you will be required to complete this either individually or as part of a group outside formal classroom time.
- Use extensive learning resources which you are required to source using the institutional library and the Internet.

10. LEGAL UNDERTAKING (COMPULSORY)

Registered students of the programme are required to accept the terms, conditions, rules and regulations set out in this guide as well as by the institution by signing the online form found on MyClassRoom.CPUT.ac.za.

10.1 Example Form

STUDENT NAME:		
STUDENT NUMBER:		
SUBJECT CODE:		
LECTURER NAME:		

I undertake:

- to comply with all the rules and regulations, including the disciplinary rules, of the Cape Peninsula University of Technology (CPUT).
- to familiarise myself with and adhere to all the rules and general regulations applicable to all aspects of the subject as detailed in the CPUT rule book and this Subject Guide.
- that I will go through all the lessons loaded on MyClassRoom.CPUT.ac.za.
- that I will engage in classroom and practical sessions, and ask relevant questions to the subject matter.

I acknowledge that I am aware of the CPUT's policy and regulations regarding plagiarism and honesty in academic work.

SIGNED AT:		
ON THIS DAY:		**OF 2019**
STUDENT SIGNATURE:		

Cape Peninsula
University of Technology

FACULTY OF INFORMATICS & DESIGN

Diploma in Information & Communication Technology

MULTIMEDIA DESIGN 2: MUD260S

SUBJECT GUIDE:	2019
COURSE CODE:	MUD260S
NQF LEVEL:	6

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ORGANISATIONAL COMPONENT

1. INTRODUCTION

1.1 Significance of this Module

Multimedia Design 2 attempts to provide a strong introduction to the basics of graphic design principles and techniques to enhance your overall ability to design aesthetically pleasing multimedia interfaces and artefacts.

During the year your abilities to engage and communicate the conceptualisation of your designs will be developed. The subject discussions will also provide more detailed theoretical and practical exposure to logo, web and brand design approaches including the introduction of user interface and experience.

1.2 Student Participation and Requirements

Students are expected to engage in class lecture and practical sessions to ensure their understanding of the theoretical concepts and the application thereof. While the lecturers provide extensive notes, tutorials and projects to ensure that students are well-equipped, students are required to do extensive self-study. The onus is on students to liaise with their lecturers if they have any questions or are experiencing any difficulty during the programme.

2. GENERAL

2.1 Contact Information

DESIGNATION	NAME	LOCATION	TELEPHONE NUMBER	E-MAIL ADDRESS
Subject Co-ordinator	W. Koopman	Engineering 2.52B	021 469 1042	koopmanw@cput.ac.za
Lecturer	M. Hamman	Engineering 2.23 (Office 5)	021 460 3836	hammanm@cput.ac.za
Secretary	N. Allie	Engineering	021 460 3010	allien@cput.ac.za

2.2 Class Times and Venues

CONTACT SESSION	VENUES	DAY & TIME
Lecture	Lab 1.22	4 periods per week
Consultation	Room 2.23 (Office 5)	1 period per week

- Two periods per week have been allocated to this instructional offering.
- Attendance of lectures and practical sessions is compulsory.
- Three periods per week will be used for practical learning sessions, one period for a formal lecture and your lecturer will be available for consultation via appointment only.
- The practical session will give students an opportunity to engage with tutorials in an effort to learn the various software and apply these skills to completing assignments.
- Formal lectures will deal with the theoretical concepts of the course.
- Consultations with your lecturer to discuss specific concerns, problems areas or to seek individual advice can also be booked. No walk-ins allowed. **Book consultations by appointment at least 24-hours beforehand via email.**
- You are required to spend a substantial amount of time learning by yourself or with other classmates. To be successful in this subject, it is recommended that you spend the following amounts of time on these learning activities:

- Self-study and independent research (+- 4 hours per week). Various weekly tasks will be set and you will be required to complete this either individually or as part of a group outside formal classroom time;
- Use extensive learning resources which you are required to source using the institutional library and the Internet;
- Actively participate in all classroom activities and develop your own insights, opinions, understandings and ideas.
- Group and peer co-operation is seen as a vital learning strategy that you will be encouraged to develop and use.

2.3 Learner Management System (LMS)

The CPUT LMS MyClassRoom.CPUT.ac.za (Blackboard) is used extensively during this module and serves as the ONLY method of submission for ALL assignments. Assignment briefs will be made available via MyClassRoom.CPUT.ac.za. It is the student's responsibility to get thoroughly acquainted with this platform.

PLEASE NOTE: Submissions will ONLY be accepted via MyClassRoom.CPUT.ac.za

- NO email submissions will be accepted.
- NO Google drive submissions will be accepted.

3. STUDY MATERIALS AND PURCHASES

3.1 Study Material

- A5 Visual Diary (no lines);
- R200 for photocopy and printing cost;
- Access to a computer, the internet and, occasionally, a printer;
- Flash drive or of 32 gigs or larger.

3.2 Compulsory Readings

CPUT Library Resource: Books24x7

- **Don't Make Me Think**, Steve Krug (ISBN: 978-0321344755)
- **White Space is Not Your Enemy: A Beginner's Guide to Communicating Visually through Graphic, Web & Multimedia Design**, Kim Golombisky and Rebecca Hagen (ISBN:9780240812816)
- **Sketching User Experiences: Getting the Design Right and the Right Design**, Bill Buxton (ISBN:9780123740373)
- **Visualize This: The FlowingData Guide to Design, Visualization, and Statistics**, Nathan Yau (ISBN:9780470944882)
- **Convert!: Designing Web Sites to Increase Traffic and Conversion**, Ben Hunt (ISBN:9780470616338)
- **Rocket Surgery Made Easy: The Do-It-Yourself Guide to Finding and Fixing Usability Problems**, Steve Krug (ISBN:9780321657299)
- **Web by Design: The Complete Guide**, Molly E. Holzschlag (ISBN:9780782122015)
- **Above the Fold: Understanding the Principles of Successful Web Site Design**, Brian Miller (ISBN:9781440308420)
- **Interaction Design: Beyond Human-Computer Interaction**, Helen Sharp, Yvonne Rogers and Jenny Preece (ISBN:9780470018668)
- **Typography Best Practices**, Smashing Magazine (ISBN:9783943075557)
- **Getting StartED Building Websites**, Alexander Dawson (ISBN:9781430225171)
- **Smashing UX Design: Foundations for Designing Online User Experiences**, Jesmond Allen and James Chudley (ISBN:9780470666852)
- **The Smashing Book #4: New Perspectives on Web Design**, Smashing Magazine (ISBN:9783944540603)
- **Creating Meaningful Websites**, Smashing Magazine (ISBN:9783944540368)

3.3 Websites

- http://www.brandsoftheworld.com
- http://designyoutrust.com
- http://www.awwwards.com
- http://designtaxi.com
- http://www.mymodernmet.com
- http://tutsplus.com
- http://www.photoshopessentials.com

An extensive list will also be provided during the presentation of the various modules.

4. MODULE CREDITS

4.1 Planning of Time Allocation for Learning Activities

METHOD	% OF YOUR LEARNING TIME
Seminars / Practicals (face-to-face, limited interaction or technologically mediated)	20%
Independent self-study of standard texts and references and specially prepared materials (study guides, books, journals, etc.)	30%
Independent self-study, time needed to prepare for assessments (using online tutorials to better acquaint with the software needed)	30%
Student learning groups (working with your peers for group assignments)	20%

ASSESSMENT BREAKDOWN AND WEIGHTS					
(An average mark of 50% is required to pass each module)					
	1ST TERM	**2ND TERM**	**3RD TERM**	**4TH TERM**	**TOTALS**
Will assessment be included in this term?	**YES**	**YES**	**YES**	**YES**	100%
Total assessment weight for the term	10%	30%	25%	35%	
Will the assessment be moderated?	No	**YES**	No	**YES**	
Students who fail this subject will have to repeat it the following year.					

5. ETHICAL CONDUCT

5.1 Plagiarism

Plagiarism is both unethical and illegal and may be regarded as a criminal offence in terms of the Copyright Act 98 of 1978.

Plagiarism refers to the appropriation of the work or ideas of others. Plagiarism is an attempt to represent other person's ideas, expressions, artefacts or work as one's own.

Cutting and pasting from electronic sources into one's own document or design artefact, copying from the work of another student, overuse of sources and excessive paraphrasing are common forms of plagiarism in writing. Plagiarism can occur when the writer is unfamiliar with in-text and end-of-text referencing conventions and can be intentional or unintentional.

Additionally, plagiarism also takes the form of appropriating another's artistic work (e.g. photographs, logo design, website design, etc.) as one's own.

CPUT places a high premium on its academic standards and subscribes to a value system that requires strong action against plagiarism. Being regarded as a serious contravention of the University's rules, plagiarism can lead to expulsion from the University. No student shall plagiarise. If you are unsure, you can consult your rulebook for more information on the University's plagiarism policy.

6. ASSESSMENT

6.1 Assessment Policy and Regulations

In this subject different methods will be used to see the extent of what you have learnt from attending classes and engaging with the course content. Please refer to the 2019 student diary for the institution's policy concerning the conduct relating to student assessments, examinations and tests.

In the case of any alleged misconduct, disciplinary procedures will be instituted against the student. These rules/procedures are stipulated in the 2019 student diary. It is the student's responsibility to familiarise themselves with these rules.

- You will be asked to demonstrate your understanding of course related theory or apply your knowledge in a practical manner. You will demonstrate your learning on a continual basis i.e. through various written or practical tasks.
- All tasks or assessments will be awarded marks, and are designed to provide you with feedback. Feedback is meant to give you a better understanding of how well you are processing the subject content and how to correct, amend and improve on any weakness identified by your lecturer.
- Assessments will take the form of written assignments and essays, practical demonstrations of your understanding, oral presentations and group based projects. Your understanding and application of various concepts are vital, and not your ability to memorise facts, the assessment briefs and rubrics in this subject will help you to demonstrate this more effectively.
- You may be given the opportunity to complete your assessment individually, in pairs or in groups.

6.2 Briefs

All assessments be communicated to you via an assessment brief and a rubric.

- The brief will outline all the specifications and requirements for a particular assessment and it will also include an outline of the criteria by which your learning will be judged.
- The type of assessment you will be doing in each of the terms will be discussed with you in detail during a classroom session. The brief will be handed out to you at least two weeks before the assessment due date.
- Copies of all briefs will also be provided in a soft copy format via MyClassRoom.CPUT.ac.za.

6.2.1 Deadlines

Because the multimedia industry is deadline driven, it is very important that you learn to stick to deadlines. Thus, all assessment due dates in this subject are **NON-NEGOTIABLE.** The programme has specific penalties for the late submission of any task.

It is very important that you become familiar with those rules and consult your lecturer well ahead of time if there are any valid reasons why you might not be able to meet your assessment deadline.

Penalties for the late submission of tasks will be strictly enforced.

You will receive your completed assessment task along with feedback that will identify what you did well and where you need to improve within 14 days of submitting a task.

Any queries or concerns you have about a particular assessment or the mark assigned for an assessment must be discussed with the lecturer concerned within five days of receiving your feedback and marks.

6.3 Assessment Related Queries

Any queries or concerns you have about a particular assessment or the mark assigned for an assessment must be discussed with the lecturer concerned as soon as possible after you have received your feedback and marks. Queries regarding marks will not be entertained beyond two weeks after receiving your marks unless a valid reason is communicated/submitted (e.g. medical certificate, etc.).

6.4 Absence for a Test/Examination/Presentation

If a student is unable to write or be present at a scheduled test/examination/presentation, they must notify the concerned lecturer ahead of the scheduled assessment (e.g. if a student is sick, experienced a traumatic event, etc.). Only valid and reasonable grounds will be regarded as acceptable and where applicable, supporting documents must be produced. At the discretion of the lecturer, a re-test or any other form of assessment may be scheduled. If a student misses a scheduled test/examination without informing the lecturer, they will get a zero (0). The onus is thus on the student to keep the lecturer concerned informed in the event of them not being able to sit for a test/examination.

6.5 Assignment Submission Details

ALL ASSIGNMENTS MUST BE HANDED IN, IN DIGITAL FORMAT.

- **ELECTRONIC ASSIGNMENTS:** ALL assignments are to be submitted via MyClassRoom.CPUT.ac.za **ONLY**, before or on a specific due date and time. Once submitted, it is the onus of the student to ensure that the lecturer did in fact receive their hand-in.
- **LATE HAND-INS OF ASSIGNMENTS:** The submission of late hand-ins of assignments will not be tolerated. In the event of a late-in, the student will be penalised and marks **will be deducted**. Late assignments will be decreased by **10% per day** for each day past the due date, but not exceeding three (3) days. In the event of submission being more than three days late, the student will get **zero (0)**. **Valid reasons** must be timeously communicated to the lecturer in order to avoid the afore-mentioned penalty. The student can make contact with the lecturer via e-mail or in-person explaining the reason for the late hand-in (and where applicable, submit supporting documents). On the discretion of the concerning lecturer, the lecturer may allow an extension.
- **REFERENCING:** To prevent any incidence as mentioned in 5.1 above, it is imperative to reference your source(s). **Harvard referencing for beginners**.

It is recommended that the student makes use of **academic journals** and **textbooks** and does not solely rely on websites. The institution's library offers a wide range of services, hosting various article databases, Government publications, etc. This information is readily available under the library link on the CPUT website.

EXAMPLES OF THE HARVARD METHOD:

IN-TEXT REFERENCING	END-OF-TEXT REFERENCING
According to Guirdham (1995:439), constructive conflict can lead to creative solutions to problems and force people to tackle socio-emotional issues.	People often react to conflict by suppressing it, usually to avoid confrontation (Folger, Poole & Stutman, 1993:4).
Kreitner and Kinicki (2007:192) define job satisfaction as an "effective or emotional response toward various facets of one's job" and as such derive from a combination of factors.	Buitendach and De Witte (2005) assert that there are two main types of factors that influence job satisfaction, namely extrinsic and intrinsic factors (cited in Josias, 2005:53).
BIBLIOGRAPHY Sources used in the text must appear in the bibliography. The bibliography must be listed in alphabetical order. Refer to the Harvard referencing guide for examples.	

6.6 Assessment Opportunities: Administration

- The nature of your assessment will be communicated to you via an assessment brief and a detailed rubric.
- The brief will outline all the specifications and requirements for a particular assessment and it will also include an outline of the criteria by which your learning will be judged.
- The type of assessment you will be doing in each of the terms will be discussed with you in detail during a classroom session, normally at the start of a new topic. The brief will be handed out to you at least two weeks before the assessment due date.

7. GENERAL NOTES: ASSIGNMENTS

7.1 Format and Editing

Formatting and editing is important in order to present quality work. Adhering to the stipulated guidelines also results in uniformity and it allows students to practice for future industry standards and academic related work. Finally, poor and inconsistent formatting, grammatical and spelling mistakes will result in poor marks.

- Only use **12pt**, **Calibri, Cambria, Century Gothic, Verdana, Tahoma or Arial** for your assignments.
- Always **proof read** your work before handing in any written assignment/project/essay. If you are not proficient in English, get assistance from someone who is more proficient in the English language.
- Always use the **spell checker set to UK English**. You will lose marks unnecessarily if there are obvious spelling errors.
- Avoid using **very long sentences**. This can potentially lead to misinterpretation and poor clarity.
- The **flow of ideas** and information needs to be logical and systematic.
- **Page numbers** must always be added.
- **NO "fancy" fonts.**
- **Use 1.5 line spacing** for all typed and printed submissions.
- **Use headings where necessary.** Main headings should be bold and in capital letters, sub-headings in bold. Ensure that you number the headings correctly.

STUDY COMPONENT

8. MODULE SPECIFICATIONS

8.1 Purpose of the Module

On successful completion of this subject, you will be able to:

- Understand and use **basic drawing and sketching techniques** to allow you to produce scamps, storyboards and visual diaries as part of the **conceptualisation process** of the design of any multimedia interface.
- Use your understanding of the principles of **typography, colour, composition and general graphic design** to design and produce branding for corporate and personal brands using vector based software that can be incorporated into multimedia interfaces. This includes the development and design of **logos, brand identities, newsletters, digital interfaces as well as print-based media**.
- Use your theoretical and practical understanding of usability principles and techniques to analyse existing websites and offer creative **alternative design approaches**.
- Apply your theoretical understanding of usability to design a functional and innovative **portfolio website** that effectively serves as a promotional tool.
- Understand and apply the core principles and techniques of user experience and **user-focused interface design**.
- Develop a range of general abilities like using information appropriately; **communicate your ideas and thoughts in written, oral and visual forms** while using the suitable technologies for this purpose.
- You will also be expected to manage and **organise your time effectively** in order to complete study tasks effectively and within the timeframe allocated. On occasion you will be required to work other people in a **partnership or in groups** where you will work on your ability to **listen to each other and solve various interpersonal, design or technically related problems collectively**.

8.2 Module Structure

TERM	THEME/TOPIC	SPECIFIC OUTCOMES
Term 1 Week 1	Introduction to Multimedia Design	Discuss the functions of design in a theoretical context. Review the structures expected to be present throughout the year. Students to revisit lessons from first year in preparation for the first term.
Term 1 Week 2	Basic Design Principles	Introduce the foundations of graphic design. Explore illustrating and idea conceptualisation. Start sketching, scamping and storyboarding in a visual diary. Understanding design and layout.
Term 1 Week 3	Using Colour in Graphic Design	Discuss the use of colour in graphic design. Explore colour in digital vs. print. Investigate illustrating and idea conceptualisation. Start sketching, scamping and storyboarding in a visual diary.
Term 1 Week 4		
Term 1 Week 5	Digital vs. Print Design	Explore the principles of digital and print design.
Term 1 Week 6	Layout & Design	Understanding layout and design, applying the principles of design. Self-study assignments.
VACATION		
TERM	**THEME/TOPIC**	**SPECIFIC OUTCOMES**
Term 2 Week 1	Typography	Take an in-depth look at typography and examine its use as a design tool in print and digital. Create typographic poster for print. Create a typography dominant html newsletter.
Term 2 Week 2		
Term 2 Week 3		
Term 2 Week 4	Logo and Icon Design	Conceptualise a logo and icon design. Produce a logo and icon design for print and digital use.
Term 2 Week 5		
Term 2 Week 6	Branding and Identity	Investigate the principles of branding and corporate identity design. Discuss emotive branding and creating brand relationships. Discuss the evolution of branding.
Term 2 Week 7		
TEST/PROJECT/SICK TEST WEEK		
VACATION		

TERM	THEME/TOPIC	SPECIFIC OUTCOMES
Term 3 Week 1 **Term 3 Week 2**	Branding and Identity	Investigate the principles of branding and corporate identity design. Discuss emotive branding and creating brand relationships. Discuss the evolution of branding.
Term 3 Week 3 **Term 3 Week 4** **Term 3 Week 5**	Marketing Material Design	Identify the different types of basic marketing material. Apply the digital and print design principles as well as the typography, logo and icon design skills to create print and digital marketing material.
TEST/PROJECT/SICK TEST WEEK		
VACATION		
TERM	**THEME/TOPIC**	**SPECIFIC OUTCOMES**
Term 4 Week 1 **Term 4 Week 2** **Term 4 Week 3**	Brand Strategy	Examine the principles of brand strategy and define the key elements to creating unique brand identities. Create a personal brand strategy.
Term 4 Week 4 **Term 4 Week 5** **Term 4 Week 6**	Creating a Personal Brand	Define and create your personal brand that represents you as a Multimedia Specialist. Branding includes a brand strategy, logo, business card, newsletter layout, email signatures, etc.
TEST/PROJECT/SICK TEST WEEK		
VACATION		

8.3 Articulation with Other Modules in the Programme

This module links in with the other modules in the year group to help students to develop a more complex understanding of the role of multimedia in a working world. This understanding calls on the ***SOLO taxonomy.***

The SOLO taxonomy stands for: **S**tructure of **O**bserved **L**earning **O**utcomes.

It describes levels of increasing complexity in a student's understanding of a subject through five stages, each of which embraces previous levels, but adds something more:

1. **Pre-structural:** students simply acquire unconnected information, which have no organisation and make no sense.
2. **Unistructural:** simple and obvious connections are made, but without their significance being understood.
3. **Multistructural:** a number of connections may be made, but the meta-connections between them are missed, as is their significance for the whole.

4. **Relational** level: the student is now able to appreciate the significance of the parts in relation to the whole.
5. At the **extended abstract** level, the student is making connections not only within the given subject area, but also beyond it, able to generalise and transfer the principles and ideas underlying the specific instance.

8.4 Learning Presumed to Be in Place

General abilities to collect, analyse and organise information of a visual and graphic nature. You are expected to have a basic ability to construct ideas in a logical way, and the ability and desire to be able to look at various social, practical and aesthetic problems from a number of different angles.

8.5 Critical Cross-field Outcomes

The critical cross-field outcomes include, but are not limited to the following in the context of multimedia and in particular multimedia design:

- Identifying and solving problems by using critical and creative thinking.
- Working effectively with others as a member of a team, group, organisation, community.
- Organising and managing oneself and one's activities responsibly and effectively.
- Collecting, analysing, organising and critically evaluating information.
- Communicating effectively using visual and language skills in the modes of oral and written persuasion.
- Using science and technology responsibly, effectively and critically, showing responsibility towards the environment and health of others.
- Demonstrating an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
- Contributing to the full personal development of each learner and the social and economic development of society at large by making it the underlying intention of any programme of learning to make an individual aware of the importance of:
    - reflecting on and exploring a variety of strategies to learn more effectively;
    - participating as responsible citizens in the lives of local, national and global communities;
    - being culturally and aesthetically sensitive across a range of social contexts;
    - exploring education and career opportunities;
    - and developing entrepreneurial opportunities.

9. STUDY UNITS/STUDY THEMES

9.1 Specific Outcomes

STUDY UNIT OUTCOMES			
UNIT 1: GRAPHIC DESIGN	Introduce, discuss and explore the theoretical aspects of graphic design for multimedia.	Problems to do in class; group discussion in class; homework tutorials on problems.	Discover the basics of colour, illustration and idea conceptualisation. Create a visual diary that will become an integral part of the year's assignments.
UNIT 2: DIGITAL DESIGN VS PRINT DESIGN	Debate digital and print design and explore their differences. Examine typography, layouts and designing marketing material for digital and print. Explore data visualisation and consider its usefulness in the current economy of information dissemination.	Problems to do in class; group discussion in class; homework tutorials on problems.	Create typography rich material, logos, icons and implement elements to create marketing material. Use skills acquired through the previous lessons to conceptualise and create an infographic.
UNIT 3: BRANDING	Investigate the process of defining a brand, creating and implementing a brand strategy.	Problems to do in class; group discussion in class; homework tutorials on problems.	Define the importance of emotive branding in a digital economy. Create a personal brand. Use skills acquired in term two to create a personal brand.

9.2 Assessment Opportunities

In this subject different methods will be used to see the extent of what you have learnt from attending classes and engaging with the course content.

- You will be asked to demonstrate you understanding of course related theory or apply your knowledge in a practical manner. You will demonstrate your learning on a continual basis i.e. through various small written or practical tasks. There are two major exams written for this subject.
- Some of these tasks or assessment will be awarded marks, while others are designed to provide you with feedback. You can use the feedback you received to understand how well you are learning the subject content and how you can improve on any weakness identified by your lecturer.
- Assessments will take the form of written exams, assignments and essays as well as practical demonstrations of your understanding like when designing a website or an image, oral presentations, take home exams and group based projects. Your understanding and application of various concepts are seen as most important and not your ability to memorise facts, the assessments forms in this subjects will therefore help you to demonstrate this more effectively.
- You may be given the opportunity to complete your assessment individually, in pairs or in groups.

9.3 Assessment Criteria

Assessments will be graded against criteria applicable to problem solving assignments:

THRESHOLD	GOOD	EXCELLENT
GATHERING AND ANALYSIS OF INFORMATION		
Uses the obvious sources to get information showing some investigative skill to find them. Few sources used.	Uses additional sources of information, apart from those given, showing investigative skills.	Evaluating and comparing of different sources of information. Additional information gathered as solution develops.
There is some assessment as to what more or different information may be needed (completeness), though information found may be slightly incomplete.	Gives some sort of assessment of the information as to its completeness and its relevance and accuracy.	Manages to assess the quality of the information (this is good information because …) in terms of that particular area of interest.
PROBLEM SOLVING APPROACH		
Basic actions to achieve solution identified. Implications of actions not always considered. Some unrealistic expectations.	Actions identified are realistic and sufficiently detailed. Thought is given to implementation.	Evidence of pro-active planning, i.e. all implications anticipated and considered.
Solutions suggested indicate limited understanding of problem. Only typical solutions proposed or existing solutions copied. Constraints tend to limit possible solutions.	Typical and new solutions proposed through idea generating processes. Adapting of existing solutions	Solutions show innovative approach to problem Solutions show integration and transfer of knowledge between problems. Building on from existing solutions. Unlike threshold, constraints used to innovate.

9.4 Self-study Activities

- Various weekly tasks will be set and you will be required to complete this either individually or as part of a group outside formal classroom time.
- Use extensive learning resources which you are required to source using the institutional library and the Internet.

10. LEGAL UNDERTAKING (COMPULSORY)

Registered students of the programme are required to accept the terms, conditions, rules and regulations set out in this guide as well as by the institution by signing the online form found on MyClassRoom.CPUT.ac.za.

10.1 Example Form

STUDENT NAME:		
STUDENT NUMBER:		
SUBJECT CODE:	MUD60S	
LECTURER NAME:	Meagan Hamman	
I undertake: • to comply with all the rules and regulations, including the disciplinary rules, of the Cape Peninsula University of Technology (CPUT). • to familiarise myself with and adhere to all the rules and general regulations applicable to all aspects of the subject as detailed in the CPUT rule book and this Subject Guide. • that I will go through all the lessons loaded on MyClassRoom.CPUT.ac.za. • that I will engage in classroom and practical sessions, and ask relevant questions to the subject matter. I acknowledge that I am aware of the CPUT's policy and regulations regarding plagiarism and honesty in academic work.		
SIGNED AT:		
ON THIS DAY:		**OF 2019**
STUDENT SIGNATURE:		

Cape Peninsula
University of Technology

FACULTY OF INFORMATICS & DESIGN

MULTIMEDIA TECHNOLOGY 2: MUT260S

SUBJECT GUIDE:	**2019**
COURSE CODE:	**DPICTM**
NQF LEVEL:	**6**

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1 INTRODUCTION

1.1 Significance of this module

Multimedia Technology II will provide you with technology theory and practice to complement your Multimedia skills. Tools and techniques will be introduced that will develop enhance your overall abilities.

This subject requires that you become an active participant in this lifelong learning practice. During the year your abilities to design, implement and debug software products will be assessed.

The subject will concentrate on web development as its primary pedagogic tool.

2 GENERAL

2.1 Contact Information

DESIGNATION	NAME	BUILDING & ROOM NUMBER	TELEPHONE NUMBER	E-MAIL ADDRESS
Subject Co-ordinator	W. Koopman	Engineering Room 2.54	021 469 1042	koopmanw@cput.ac.za
Lecturer	S. Williams	Engineering Room 2.52a	021 460 3359	williamssjs@cput.ac.za
Secretary	N. Allie	Engineering	021 460 3010	allien@cput.ac.za

- Individual consultations with your lecturer to discuss your specific concerns, problems areas or to seek individual advice can also be booked.
- Concerns and suggestions should be communicated to your class representative.

2.2 Time Table

CONTACT SESSION	VENUES	DAY & TIME
Lecture	Room 1.22	1 periods per week
Practical	Room 1.22	1 periods per week

- Attendance of all sessions is compulsory
- At least one roll call will be made during a session.
- 2 periods per week for a period of 32 weeks have been allocated to this instructional offering.
- One periods per week will be used for classroom and practical, one periods as a formal lecture.
- The practical session will take the form of facilitated, interactive individual and group activities and tasks that require you to actively engage and participate in discussions, debates and presentations. In this session, you, the lecturer and your fellow students will communicate course content and deal with logistical and administrative issues regarding the course and assessments.
- Individual consultations with your lecturer to discuss your specific concerns, problems areas or to seek individual advice can also be booked.
- During the formal lecture, the lecturer might present formal summaries of the relevant and topical content and knowledge that is regarded as useful to help you understand and grow in the subject and the technology.
- In addition to working with your lecturer during classroom and practical sessions, you will also be required to spend a substantial amount of time learning by yourself or with other classmates. To be successful in this subject, it is recommended that you spend the following amounts of time on these learning activities:

- Self-study and independent research (+- 6 hours per week). Various weekly tasks will be set and you will be required to complete this either individually or as part of a group outside formal classroom time;
- Use extensive learning resources which you are required to source using the institutional library and the Internet;
- Actively participate in all classroom activities and develop your own insights, opinions, understandings and ideas. Group and peer co-operation is seen as a vital learning strategy that you will be encouraged to develop and use.

2.3 Learner Management System (LMS)

The CPUT LMS MyClassRoom.CPUT.ac.za (myclassroom) is used extensively during this module and serves as the primary method of communication and assignment submission. All assignment briefs will also be made available via MyClassRoom.CPUT.ac.za. It is the student's responsibility to get thoroughly acquainted with this platform.

3 STUDY MATERIALS AND PURCHASES

COURSE TEXTBOOKS

- **JavaScript tutorial**, Tutorials Point (Free PDF available)

RECOMMENDED READINGS

- **JavaScript Enlightenment**, Cody Lindley First Edition, based on JavaScript 1.5, ECMA-262, Edition 3
- **HTML5 Canvas**, by Steve Fulton and Jeff Fulton

WEBSITES

- www.w3schools.com
- stackoverflow.com
- json.org
- github.com
- htmldog.com
- www.webdesignbook.org

An extensive list will also be provided during the presentation of the various modules.

MATERIALS AND STATIONERY

- A4 Hardcover.
- Access to android or IOS smart phone.
- Airtime for premium SMS.
- 2Gig mobile data.
- Portable Hard Drive or Flash Drive for storage of large files: at least 32GB, bigger will be better.

4 ASSESSMENT

4.1 Assessment Policy and Regulations

In this subject, different methods will be used to see the extent of what you have learnt from attending classes and engaging with the course content. Please refer to the 2019 student diary for the institution's policy concerning the conduct relating to student assessments, examinations and tests.

In the case of any alleged misconduct, disciplinary procedures will be instituted against the student. These rules/procedures are stipulated in the 2019 student diary. It is the student's responsibility to familiarise themselves with these rules.

- You will be asked to demonstrate your understanding of course related theory or apply your knowledge in a practical manner. You will demonstrate your learning on a continual basis i.e. through various small written or practical tasks.
- Some of these tasks or assessment will be awarded marks, while others are designed to provide you with feedback. You can use the feedback you received to understand how well you are learning the subject content and how you can improve on any weakness identified by your lecturer.
- Assessments will take the form of written assignments and essays, practical demonstrations of your understanding like when designing a website or an image, oral presentations, formal exams and group-based projects. Your understanding and application of various concepts are seen as most important and not your ability to memorise facts, the assessments forms in this subject will, therefore, help you to demonstrate this more effectively.
- You may be given the opportunity to complete your assessment individually, in pairs or in groups.

4.2 Briefs

The nature of your assessment will usually be communicated to you via an assessment brief.

The brief will outline all the specifications and requirements for a particular assessment and it will also include an outline of the criteria by which your learning will be judged. The type of assessment you will be doing in each of the terms will be discussed with you in detail during a classroom session, normally at the start of a new topic. The brief will be handed out to you at least two weeks before the assessment due date.

Copies of all briefs will also be provided in a soft copy format via MyClassRoom.CPUT.ac.za.

Because the multimedia industry is deadline driven, it is very important that you learn to stick to deadlines. Thus all assessment due dates in this subject are NON-NEGOTIABLE. The programme has specific penalties for the late submission of any task. It is very important that you become familiar with those rules and consult your lecturer well ahead of time if there are any valid reasons why you might not be able to meet your assessment deadline.

Penalties for the late submission of tasks will be strictly enforced.

- You will receive your completed assessment task along with feedback that will identify what you did well and where you need to improve within three weeks of submitting a task. At the same time, your individual subject marks will be displayed on the **myclasssrom** website.
- Any queries or concerns you have about a particular assessment or the mark assigned for an assessment must be discussed with the lecturer concern as soon as possible after you received your feedback and marks.

4.3 Plagiarism

Plagiarism refers to the appropriation of the work or ideas of others. Plagiarism is an attempt to represent other person's ideas, expressions, artefacts or work as one's own. Cutting and pasting from electronic sources into one's own document or design artefact, copying from the work of another student, overuse of sources and excessive paraphrasing are common forms of plagiarism. Plagiarism can occur when the writer is unfamiliar with in-text and end-of-text referencing conventions and can be intentional or unintentional.

Plagiarism is both unethical and illegal and may be regarded as a criminal offence in terms of the Copyright Act 98 of 1978. CPUT places a high premium on its academic standards and subscribes to a value system that requires strong action against plagiarism. Being regarded as a serious contravention of the University's rules, plagiarism can lead to expulsion from the University. No student shall plagiarise.

4.4 Assessment Related Queries

Any queries or concerns you have about a particular assessment or the mark assigned for an assessment must be discussed with the lecturer concerned as soon as possible after you have received your feedback and marks. Queries regarding marks will not be entertained beyond two weeks after receiving your marks unless a valid reason is communicated/submitted (e.g. medical certificate, etc.).

4.5 Absence For a Test/Examination/Presentation

If a student is unable to write or be present at a scheduled test/examination/presentation, he/she must notify the concerned lecturer ahead of the scheduled assessment (e.g. if a student is sick, experienced a traumatic event, etc.). Only valid and/or reasonable grounds will be regarded as acceptable and where applicable, supporting documents must be produced. At the discretion of the lecturer, a re-test or any other form of assessment may be scheduled. If a student misses a scheduled test/examination without informing the lecturer, he/she will get a zero (0). The onus is thus on the student to keep the concerned lecturer informed in the event of him/her not being able to sit for a test/examination.

4.6 Assignment Submission Details

Printed assignments: must be placed in the relevant subject assignment box no later than the assigned deadline. Once submitted, it is the onus of the student to ensure that the lecturer did in fact receive his/her hand-in.

Electronic assignments: are to be submitted via e-mail, MyClassRoom.CPUT.ac.za or any other method as specified by the lecturer. The lecturer will however communicate the method to be used for each assignment and will specify the due date and time. Once submitted, it is the onus of the student to ensure that the lecturer did in fact receive his/her hand-in.

Late hand-ins of assignments: The submission of late hand-ins of assignments will not be tolerated. In the event of a late-in, the student will be penalised and marks **will be deducted**. Late assignments will be decreased by **10% per day** for each day past the due date, but not exceeding five (5) days. In the event of submission being more than five days late, the student will get **zero (0)**. **Valid reasons** must be timeously communicated to the lecturer in order to avoid the afore-mentioned penalty. The student can make contact with the lecturer either telephonically, via e-mail or in-person explaining the reason for the late hand-in (and where applicable, submit supporting documents). On the discretion of the concerning lecturer, the lecturer may allow an extension.

Referencing: To prevent any incidence as mentioned in 5.1 above, it is imperative to reference your source/s. The examples contained in the table below represent some methods of referencing, using the Harvard referencing style.

IN-TEXT REFERENCING	END-OF-TEXT REFERENCING
According to Guirdham (1995:439), constructive conflict can lead to creative solutions to problems and force people to tackle socio-emotional issues.	People often react to conflict by suppressing it, usually to avoid confrontation (Folger, Poole & Stutman, 1993:4).
Kreitner and Kinicki (2007:192) define job satisfaction as an "effective or emotional response toward various facets of one's job" and as such derive from a combination of factors.	Buitendach and De Witte (2005) assert that there are two main types of factors that influence job satisfaction, namely extrinsic and intrinsic factors (cited in Josias, 2005:53).
Sources used in the text must appear in the bibliography. The bibliography must be listed in alphabetical order. Refer to the Harvard referencing guide for examples.	

The above represent limited examples. For a more comprehensive document on the Harvard referencing style, access the library link on the CPUT website.

It is recommended that the student makes use of academic journals and textbooks and does not solely rely on websites. The institution's library offers a wide range of services, hosting various article databases, Government publications, etc. This information is readily available under the library link on the CPUT website.

4.7 Assessment Opportunities: Administration

The nature of your assessment will be communicated to you via an assessment brief and a detailed rubric.

- The brief will outline all the specifications and requirements for a particular assessment and it will also include an outline of the criteria by which your learning will be judged.
- The type of assessment you will be doing in each of the terms will be discussed with you in detail during a classroom session, normally at the start of a new topic. The brief will be handed out to you at least two weeks before the assessment due date.

4.8 ASSESSMENT BREAKDOWN AND WEIGHTS

	1ST TERM	2ND TERM	3RD TERM	4TH TERM	TOTALS
Will assessment be included in this term?	YES	YES	YES	YES	100%
Total assessment weight for the term	15%	35%	25%	25%	
Will the assessment be moderated?	No	Yes	No	YES	

5 GENERAL NOTES: ASSIGNMENTS

5.1 Format and editing

Formatting and editing is important in order to present quality work. Adhering to the stipulated guidelines also results in uniformity, which ensures that the concerned lecturer has a consistent standard when assessing and evaluating work. Furthermore, it allows students to practice for future industry standards and academic related work. Finally, poor and inconsistent formatting, grammatical and spelling mistakes will result in poor marks.

- Always **proof read** your work before handing in any written assignment/project/essay. If you are not proficient in English, get assistance from someone who is more proficient in the English language.
- Always use the **spell checker set to UK English**. You will lose marks unnecessarily if there are obvious spelling errors.
- Avoid using **very long sentences**. This can potentially lead to misinterpretation and poor clarity.
- The **flow of ideas** and information needs to be logical and systematic.
- **Page numbers** must always be added.
- **Avoid using "fancy" fonts.** Certain fonts, such as Castellar, Curlz MT, Edwardian Scripts, etc., are hard to read and can potentially be misread. Attempt to use more reader friendly fonts such as Arial, Century Gothic, Times New Roman, Tahoma, etc.
- **Use 1.5 line spacing** for all typed and printed submissions.
- **Use headings where necessary.** Main headings should be bold and in capital letters, sub-headings in bold. Ensure that you number the headings correctly.

Example:

1. RESISTANCE TO CHANGE
   1.1 Possible causes of resistance

- When using bullets, **the same bullet style** should be used throughout your document.

5.2 Coding Styles

Producing code for review by lecturers or the broader community require that you adhere to styling and formatting guide lines. Please ensure you follow these published guidelines.

6 MODULE SPECIFICATIONS

6.1 Purpose of the Module

On successful completion of this subject, you will be able to:

Design, construct and debug JavaScript applications. Specifically your skills will be developed to successfully incorporate HTML5 CSS3 and JQuery code.

Comprehend and debug typically programming constructs these include variables, loops, and functions. Object orientate programming techniques will be emphasised.

Develop a range of general abilities like using information appropriately; **communicate your ideas and thoughts in written, oral and visual forms** while using the suitable technologies for this purpose.

You will also be expected to manage and **organise your time effectively** in order to complete study tasks effectively and within the timeframe allocated. On occasion you will be required to work other people in a **partnership or in groups** where you will work on your ability to **listen to each other and solve various interpersonal, design or technically related problems collectively**.

Module Structure

TERM	THEME/TOPIC	SPECIFIC OUTCOMES
Term 1 Week 1	Introduction to Internet Programming	• Introduction
Term 1 Week 2		• Loading of scripts and style sheets • Review of HTML5 • Visual Studio Code
Term 1 Week 3		• JavaScript data types • Browser aids
Term 1 Week 4		• JavaScript loops • Conditionals statements
Term 1 Week 5		• Functions • Objects
Term 1 Week 6		• HTML5 and JavaScript interaction • CSS functionality
Term 1 Week 7		• Debugging scripts • Using Boolean flags • ASSESSMENT 1 (Theory Test)
VACATION: TBA		
Term 2 Week 1	Intermediate Web Programming Techniques	• Combining Html forms with JavaScript • Handling user inputs
Term 2 Week 2		• JavaScript Timing functions • Random number generation • Script debugging
Term 2 Week 3		• Introducing Typescript • Arrow functions • Asynchronous vs Synchronous code
Term 2 Week 4		• Object oriented JavaScript class • Typical JavaScript Game Structure. • ASSESSMENT 2 (Assignment Submission)
Term 2 Week 5		
Term 2 Week 6		• Introducing Bootstrap • Intermediate CSS3 techniques
Term 2 Week 7		• Handling project code • ASSESSMENT 3 (Theory Test)

TEST/PROJECT/SICK TEST WEEK: 23 MAY – 10 JUN		
Term 3 Week 2	Content Management Systems	• Introduction to WordPress • Familiarization with the WordPress Database
Term 3 Week 3		• WordPress local installation • WordPress configuration and customization
Term 3 Week 4		• Working with themes • customizing WordPress themes
Term 3 Week 5		• Compare and contrast alternate CMS • Evaluation of different themes
Term 3 Week 5		• Implement custom JavaScript in WordPress.
Term 3 Week 5		ASSESSMENT 4 (WordPress site)
TEST/PROJECT/SICK TEST WEEK: 22 AUG – 2 SEP		
VACATION: 3 – 7 SEP		
Term 4 Week 1	CSS3 Techniques	• Responsive page design using Bootstrap
Term 4 Week 2		• CSS Layouts using flex and grid
Term 4 Week 3		• CSS Modal design • Simple Rest API Calls.
Term 4 Week 4	Basic Internet Server Configuration	• Domain registration, Producing live sites • Internet protocols and service providers
Term 4 Week 5		• Highlight security issues. • Understand the issues around publishing code.
Term 4 Week 6		ASSESSMENT 5 (Theory/Practical Test) ASSESSMENT 6 (Integrate Project Mark)
TEST/PROJECT/SICK TEST WEEK: 31 OCT – 18 NOV 2019		
VACATION: 9 DEC 2019		

6.2 Learning Presumed to Be in Place

General abilities to collect analyse and organise information of a visual and graphic nature. You are expected to have a basic ability to construct ideas in a logical way, and the ability and desire to be able to look at various social, practical and aesthetic problems from a number of different angles.

6.3 Critical Cross-field Outcomes

The critical cross-field outcomes include, but are not limited to the following in the context of multimedia and in particular multimedia design:

- Identifying and solving problems by using critical and creative thinking.
- Working effectively with others as a member of a team, group, organisation, community.
- Organising and managing oneself and one's activities responsibly and effectively.
- Collecting, analysing, organising and critically evaluating information.
- Communicating effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion.
- Using science and technology responsibly, effectively and critically, showing responsibility towards the environment and health of others.
- Demonstrating an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
- Contributing to the full personal development of each learner and the social and economic development of society at large by making it the underlying intention of any programme of learning to make an individual aware of the importance of:
    - reflecting on and exploring a variety of strategies to learn more effectively;
    - participating as responsible citizens in the lives of local, national and global communities;
    - being culturally and aesthetically sensitive across a range of social contexts;
    - exploring education and career opportunities;
    - and developing entrepreneurial opportunities.

7 STUDY UNITS/STUDY THEMES

7.1 Specific Outcomes

STUDY UNIT OUTCOMES	TEACHING EVENTS	LEARNING ACTIVITIES	ASSESSMENTS
UNIT 1: Introduction to Internet Programming	Introduce, discuss and explore the theoretical aspects of programming for multimedia and the internet specifically.	Problems to do in class; group discussion in class; homework tutorials on problems.	Learn the effective ways to include Scripts to your HTML code. Design and Implement basic JavaScript code snip bits.
UNIT 2: Intermediate Web Programming Techniques	Design JavaScript programs that interact with the user to provide a rich multimedia experience.	Problems to do in class; group discussion in class; homework tutorials on problems.	Use skills acquired in previous lessons to enhance and debug existing code.
UNIT 3: Content Management Systems	Investigate the different trending CMS in the multimedia industry.	Problems to do in class; group discussion in class; homework tutorials on problems.	Define the importance of content creation and management. Acquired the necessary skills to utilize a CMS effectively.
UNIT 4: Animation Techniques	Investigate the importance of CSS and its roll in modern web site. Design impactful multimedia animations.	Problems to do in class; group discussion in class; homework tutorials on problems.	Design impactful multimedia animations. Implement basic CSS animation in modern browser.
UNIT 5: Basic Internet Server Configuration	Investigate the importance of a webservers configuration. Best practices around web security. Implement an effective SEO strategy.	Problems to do in class; group discussion in class; homework tutorials on problems.	Learn server techniques to allow you to upload project content. Apply server configuration techniques. Implement and test the effectiveness of a SEO strategy.

7.2 Assessment Opportunities

In this subject different methods will be used to see the extent of what you have learnt from attending classes and engaging with the course content.

- You will be asked to demonstrate you understanding of course related theory or apply your knowledge in a practical manner. You will demonstrate your learning on a continual basis i.e. through various small written or practical tasks. There are no major exams written in this subject.
- Some of these tasks or assessment will be awarded marks, while others are designed to provide you with feedback. You can use the feedback you received to understand how well you are learning the subject content and how you can improve on any weakness identified by your lecturer.
- Assessments will take the form of written assignments and essays, practical demonstrations of your understanding like when designing a website or an image, oral presentations, take home exams and group based projects. Your understanding and application of various concepts are seen as most important and not your ability to memorise facts, the assessments forms in this subjects will therefore help you to demonstrate this more effectively.
- You may be given the opportunity to complete your assessment individually, in pairs or in groups.

7.3 Assessment Criteria

Assessments will be graded against criteria applicable to problem solving assignments:

THRESHOLD	GOOD	EXCELLENT
Problem solving approach		
Basic actions to achieve solution identified. Implications of actions not always considered. Some unrealistic expectations.	Actions identified are realistic and sufficiently detailed. Thought is given to implementation.	Evidence of pro-active planning, i.e. all implications anticipated and considered.
Solutions suggested indicate limited understanding of problem. Only typical solutions proposed or existing solutions copied. Constraints tend to limit possible solutions.	Typical and new solutions proposed through idea generating processes. Adapting of existing solutions	Solutions show innovative approach to problem Solutions show integration and transfer of knowledge between problems. Building on from existing solutions. Unlike threshold, constraints used to innovate.

7.4 Self-study Activities

- Various weekly tasks will be set and you will be required to complete this either individually or as part of a group outside formal classroom time.
- Use extensive learning resources which you are required to source using the institutional library and the Internet.

Cape Peninsula
University of Technology

FACULTY OF INFORMATICS & DESIGN

Diploma in Information & Communication Technology

MULTIMEDIA APPLICATIONS: MULTIMEDIA DESIGN 3

SUBJECT GUIDE:	2019
COURSE CODE:	MUD360S
NQF LEVEL:	6

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10. LEGAL UNDERTAKING (COMPULSORY) ..... Error! Bookmark not defined.

ORGANISATIONAL COMPONENT

1. INTRODUCTION

1.1 Significance of this Module

The **Multimedia Design 3** module provides a more in-depth investigation into the various aspects of the multimedia field and aims to prepare students for the working world. The module includes a basic introduction into the soft SEO practices and how it affects the design and implementation processes. Building on the skills gained in the second year-level, students are required to apply their design knowledge to create high-level projects as well as a professional brand and digital and print-ready portfolios that accurately showcase their skills in their chosen field. In addition, students will also be required to understand how to market themselves using online marketing and social networking platforms.

1.2 Student Participation and Requirements

Students are expected to engage in class lecture and practical sessions to ensure their understanding of the theoretical concepts and the application thereof. While the lecturers provide extensive notes, tutorials and projects to ensure that students are well-equipped, students are required to do extensive self-study. The onus is on students to liaise with their lecturers if they have any questions or are experiencing any difficulty during the programme.

2. GENERAL

2.1 Contact Information

DESIGNATION	NAME	LOCATION	TELEPHONE NUMBER	E-MAIL ADDRESS
Subject Co-ordinator	W. Koopman	Engineering 2.54	021 469 1042	koopmanw@cput.ac.za
Lecturer	M. Hamman	Engineering 2.23	021 460 3836	hammanm@cput.ac.za
Secretary	N. Allie	Engineering	021 460 3010	allien@cput.ac.za

2.2 Class Times and Venues

CONTACT SESSION	VENUES	DAY & TIME
Lecture	Lab 1.31	4 periods per week
Consultation	Meagan: Room 2.23 – office 5	1 period per week: **BY APPOINTMENT ONLY**

- Four periods per week have been allocated to this instructional offering.
- Students are required to allocate sufficient **self-study** time to hone their technical skills using Adobe Illustrator, Adobe Indesign and Adobe Photoshop. It is recommended that you spend the following amounts of time on these learning activities:
    - Self-study and independent research (+- 4 hours per week). Various weekly tasks will be set and you will be required to complete this either individually or as part of a group outside formal classroom time;
    - Use extensive learning resources which you are required to source using the institutional library and the Internet;
    - Actively participate in all classroom activities and develop your own insights, opinions, understandings and ideas.
    - Group and peer co-operation is seen as a vital learning strategy that you will be encouraged to develop and use.

- Consultations with your lecturer to discuss specific concerns, problems areas or to seek individual advice can also be booked. No walk-ins allowed. **Book consultations via email at least 24-hours beforehand.**

2.3 Learner Management System (LMS)

The CPUT LMS MyClassRoom.CPUT.ac.za (Blackboard) is used extensively during this module and serves as the ONLY method of submission for ALL assignments. Assignment briefs will be made available via MyClassRoom.CPUT.ac.za. It is the student's responsibility to get thoroughly acquainted with this platform.

PLEASE NOTE:

Submissions will ONLY be accepted via MyClassRoom.CPUT.ac.za

- **NO email submissions will be accepted.**
- **NO Google drive submissions will be accepted.**

3. STUDY MATERIALS AND PURCHASES

- Stationery and an A5 visual diary;
- Access to a computer, the internet and a printer;
- Flash drive or of 32 gigs or larger.

All academic texts are available online or in the library, and links will be shared with you on MyClassRoom.CPUT.ac.za.

4. MODULE CREDITS

4.1 Planning of Time Allocation for Learning Activities

METHOD	% OF YOUR LEARNING TIME
Lectures and practical lessons (face-to-face, limited interaction or technologically mediated)	25%
Peer learning groups (group discussions)	20%
Independent self-study of standard texts and references (study guides, books, journal articles)	25%
Independent self-study, time needed to prepare for assessment (e.g. tests/exams)	30%

<table>
<tr><th colspan="6">ASSESSMENT BREAKDOWN AND WEIGHTS</th></tr>
<tr><td colspan="6">An average mark of 50% is required to pass each module.</td></tr>
<tr><td rowspan="5">ASSESSMENT WEIGHT</td><td>1ST TERM</td><td>2ND TERM</td><td>3RD TERM</td><td>4TH TERM</td><td>TOTALS</td></tr>
<tr><td rowspan="2">SEO Content creation (5%)</td><td rowspan="2">Portfolio Visual Diary (10%)</td><td rowspan="2">Project Status Report (5%)</td><td>Integrated Project: initial planning (2.5%)</td><td rowspan="4">100%</td></tr>
<tr><td>Integrated Project (10%)</td></tr>
<tr><td rowspan="2">Professional Brand Strategy (5%)</td><td rowspan="2">Brand Design (20%)</td><td rowspan="2">Professional Portfolio and Website (20%)</td><td>Integrated Project (10%)</td></tr>
<tr><td>Integrated Project (10%)</td></tr>
<tr><td colspan="4">Weekly Tasks (2.5%)</td></tr>
<tr><td>MODERATION</td><td>No</td><td>YES</td><td>No</td><td>YES</td><td></td></tr>
<tr><td colspan="6">STUDENTS WHO FAIL THIS SUBJECT WILL HAVE TO REPEAT THE SUBJECT THE FOLLOWING YEAR.</td></tr>
</table>

5. ETHICAL CONDUCT

5.1 Plagiarism

Plagiarism is both unethical and illegal and may be regarded as a criminal offence in terms of the Copyright Act 98 of 1978.

Plagiarism refers to the appropriation of the work or ideas of others. Plagiarism is an attempt to represent other person's ideas, expressions, artefacts or work as one's own.

Cutting and pasting from electronic sources into one's own document or design artefact, copying from the work of another student, overuse of sources and excessive paraphrasing are common forms of plagiarism in writing. Plagiarism can occur when the writer is unfamiliar with in-text and end-of-text referencing conventions and can be intentional or unintentional.

Additionally, plagiarism also takes the form of appropriating another's artistic work (e.g. photographs, logo design, website design, etc.) as one's own.

CPUT places a high premium on its academic standards and subscribes to a value system that requires strong action against plagiarism. Being regarded as a serious contravention of the University's rules, plagiarism can lead to expulsion from the University. No student shall plagiarise. If you are unsure, you can consult your rulebook for more information on the University's plagiarism policy.

6. ASSESSMENT

6.1 Assessment Policy and Regulations

In this subject different methods will be used to see the extent of what you have learnt from attending classes and engaging with the course content. Please refer to the 2019 student diary for the institution's policy concerning the conduct relating to student assessments, examinations and tests.

In the case of any alleged misconduct, disciplinary procedures will be instituted against the student. These rules/procedures are stipulated in the 2019 student diary. It is the student's responsibility to familiarise themselves with these rules.

- You will be asked to demonstrate your understanding of course related theory or apply your knowledge in a practical manner. You will demonstrate your learning on a continual basis i.e. through various written or practical tasks.
- All tasks or assessments will be awarded marks, and are designed to provide you with feedback. Feedback is meant to give you a better understanding of how well you are processing the subject content and how to correct, amend and improve on any weakness identified by your lecturer.
- Assessments will take the form of written assignments and essays, practical demonstrations of your understanding, oral presentations and group based projects. Your understanding and application of various concepts are vital, and not your ability to memorise facts, the assessment briefs and rubrics in this subject will help you to demonstrate this more effectively.
- You may be given the opportunity to complete your assessment individually, in pairs or in groups.

6.2 Briefs

All assessments be communicated to you via an assessment brief and a rubric.

- The brief will outline all the specifications and requirements for a particular assessment and it will also include an outline of the criteria by which your learning will be judged.
- The type of assessment you will be doing in each of the terms will be discussed with you in detail during a classroom session. The brief will be handed out to you at least two weeks before the assessment due date.
- Copies of all briefs will also be provided in a soft copy format via MyClassRoom.CPUT.ac.za.

6.2.1 Deadlines

Because the multimedia industry is deadline driven, it is very important that you learn to stick to deadlines. Thus, all assessment due dates in this subject are **NON-NEGOTIABLE.** The programme has specific penalties for the late submission of any task.

It is very important that you become familiar with those rules and consult your lecturer well ahead of time if there are any valid reasons why you might not be able to meet your assessment deadline.

Penalties for the late submission of tasks will be strictly enforced.

You will receive your completed assessment task along with feedback that will identify what you did well and where you need to improve within 14 days of submitting a task.

Any queries or concerns you have about a particular assessment or the mark assigned for an assessment must be discussed with the lecturer concerned within five days of receiving your feedback and marks.

6.3 Assessment Related Queries

Any queries or concerns you have about a particular assessment or the mark assigned for an assessment must be discussed with the lecturer concerned as soon as possible after you have received your feedback and marks. Queries regarding marks will not be entertained beyond two weeks after receiving your marks unless a valid reason is communicated/submitted (e.g. medical certificate, etc.).

6.4 Absence for a Test/Examination/Presentation

If a student is unable to write or be present at a scheduled test/examination/presentation, they must notify the concerned lecturer ahead of the scheduled assessment (e.g. if a student is sick, experienced a traumatic event, etc.). Only valid and reasonable grounds will be regarded as acceptable and where applicable, supporting documents must be produced. At the discretion of the lecturer, a re-test or any other form of assessment may be scheduled. If a student misses a scheduled test/examination without informing the lecturer, they will get a zero (0). The onus is thus on the student to keep the lecturer concerned informed in the event of them not being able to sit for a test/examination.

6.5 Assignment Submission Details

ALL ASSIGNMENTS MUST BE HANDED IN, IN DIGITAL FORMAT.

- **ELECTRONIC ASSIGNMENTS:** ALL assignments are to be submitted via MyClassRoom.CPUT.ac.za **ONLY**, before or on a specific due date and time. Once submitted, it is the onus of the student to ensure that the lecturer did in fact receive their hand-in.
- **LATE HAND-INS OF ASSIGNMENTS:** The submission of late hand-ins of assignments will not be tolerated. In the event of a late-in, the student will be penalised and marks **will be deducted**. Late assignments will be decreased by **10% per day** for each day past the due date, but not exceeding three (3) days. In the event of submission being more than three days late, the student will get **zero (0)**. **Valid reasons** must be timeously communicated to the lecturer in order to avoid the afore-mentioned penalty. The student can make contact with the lecturer via e-mail or in-person explaining the reason for the late hand-in (and where applicable, submit supporting documents). On the discretion of the concerning lecturer, the lecturer may allow an extension.
- **REFERENCING:** To prevent any incidence as mentioned in 5.1 above, it is imperative to reference your source(s). **Harvard referencing for beginners.**

It is recommended that the student makes use of **academic journals** and **textbooks** and does not solely rely on websites. The institution's library offers a wide range of services, hosting various article databases, Government publications, etc. This information is readily available under the library link on the CPUT website.

EXAMPLES OF THE HARVARD METHOD:

IN-TEXT REFERENCING	END-OF-TEXT REFERENCING
According to Guirdham (1995:439), constructive conflict can lead to creative solutions to problems and force people to tackle socio-emotional issues.	People often react to conflict by suppressing it, usually to avoid confrontation (Folger, Poole & Stutman, 1993:4).
Kreitner and Kinicki (2007:192) define job satisfaction as an "effective or emotional response toward various facets of one's job" and as such derive from a combination of factors.	Buitendach and De Witte (2005) assert that there are two main types of factors that influence job satisfaction, namely extrinsic and intrinsic factors (cited in Josias, 2005:53).
BIBLIOGRAPHY Sources used in the text must appear in the bibliography. The bibliography must be listed in alphabetical order. Refer to the Harvard referencing guide for examples.	

6.6 Assessment Opportunities: Administration

- The nature of your assessment will be communicated to you via an assessment brief and a detailed rubric.
- The brief will outline all the specifications and requirements for a particular assessment and it will also include an outline of the criteria by which your learning will be judged.
- The type of assessment you will be doing in each of the terms will be discussed with you in detail during a classroom session, normally at the start of a new topic. The brief will be handed out to you at least two weeks before the assessment due date.

7. GENERAL NOTES: ASSIGNMENTS

7.1 Format and Editing

Formatting and editing is important in order to present quality work. Adhering to the stipulated guidelines also results in uniformity and it allows students to practice for future industry standards and academic related work. Finally, poor and inconsistent formatting, grammatical and spelling mistakes will result in poor marks.

- Only use **12pt**, **Calibri, Cambria, Century Gothic, Verdana, Tahoma or Arial** for your assignments.
- Always **proof read** your work before handing in any written assignment/project/essay. If you are not proficient in English, get assistance from someone who is more proficient in the English language.
- Always use the **spell checker set to UK English**. You will lose marks unnecessarily if there are obvious spelling errors.
- Avoid using **very long sentences**. This can potentially lead to misinterpretation and poor clarity.
- The **flow of ideas** and information needs to be logical and systematic.
- **Page numbers** must always be added.
- **NO "fancy" fonts.**
- **Use 1.5 line spacing** for all typed and printed submissions.
- **Use headings where necessary.** Main headings should be bold and in capital letters, sub-headings in bold. Ensure that you number the headings correctly.

STUDY COMPONENT

8. MODULE SPECIFICATIONS

8.1 Purpose of the Module

The Multimedia Design 3 module provides students with an introduction into website management and metrics while refining brand development and digital marketing skills with a keen focus on their professional portfolios.

8.2 Module Structure

TERM	THEME/TOPIC	SPECIFIC OUTCOMES
Term 1 Week 1	Round-up of MUD260S	Reflection on the previous year's work and the portfolio created at the end of year two. Discuss ways to fine-tune or redesign their branding. Create a database of artefacts for the portfolio.
Term 1 Week 2 **Term 1 Week 3**	Branding: Creating A Sustainable and Living Brand	Revisit the brand development process and understand its longevity and growth. Interrogate their brand's core identity and how that represents their skills in the industry. Understand and apply branding principles in creating a brand strategy and how that is translated into visual elements.
Term 1 Week 4 **Term 1 Week 5**	SEO Content Planning and Creation and Strategy Development	Discuss the basic principles of SEO content creation. Delve into the importance of creating SEO content. Experiment creating SEO content and doing keyword research. Analyse the differences between non- and -SEO optimised webpages. Investigate and prepare keywords for professional branding purposes and create content based on keyword research. Consider social media as part of this strategy process.
Term 1 Week 6		The role of social media and SEO and how it relates to SEO and the branding journey. Create a professional brand strategy that aligns with the chosen career direction. Investigate the relevant social media channels to create and the type of content that will support the portfolio.
		Create strategies for the various channels of marketing your brand digitally. Create an SEO strategy on how to target particular keywords and create written content. Create a social media strategy for content created and future content.
TEST WEEK		
RECESS		
TERM	**THEME/TOPIC**	**SPECIFIC OUTCOMES**
Term 2 Week 1 **Term 2 Week 2** **Term 2 Week 3**	Professional Portfolio	Understanding the purpose of a professional portfolio as a representation of their skills as well as their brand. Discussing the branding journey of the portfolio. Investigate portfolio inspiration and applying critical thought to creating support your portfolio items (information, motivations, and captions).
Term 2 Week 4		Develop the portfolio based on the brand strategy.
Term 2 Week 5		Create strategies for SEO, web design, print design and social media.
Term 2 Week 6	Professional Portfolio	Implement design and other strategies.

Term 2 Week 7		Produce a digital and print portfolio with well-thought out and easily implementable strategies for social media.
TEST WEEK		
VACATION		
WORK INTEGRATED LEARNING STARTS		

8.3 Articulation with Other Modules in the Programme

This module links in with the other modules in the year group to help students to develop a more complex understanding of the role of multimedia in a working world. This understanding calls on the ***SOLO taxonomy.***

The SOLO taxonomy stands for: **S**tructure of **O**bserved **L**earning **O**utcomes.

It describes levels of increasing complexity in a student's understanding of a subject through five stages, each of which embraces previous levels, but adds something more:

1. **Pre-structural:** students simply acquire unconnected information, which have no organisation and make no sense.
2. **Unistructural:** simple and obvious connections are made, but without their significance being understood.
3. **Multistructural:** a number of connections may be made, but the meta-connections between them are missed, as is their significance for the whole.
4. **Relational** level: the student is now able to appreciate the significance of the parts in relation to the whole.
5. At the **extended abstract** level, the student is making connections not only within the given subject area, but also beyond it, able to generalise and transfer the principles and ideas underlying the specific instance.

8.4 Learning Presumed to Be in Place

General abilities to collect, analyse and organise information of a visual and graphic nature. You are expected to have a basic ability to construct ideas in a logical way, and the ability and desire to be able to look at various social, practical and aesthetic problems from a number of different angles.

At this stage of the course, students are expected to have an intermediate working knowledge of the following software programmes:

- Adobe Photoshop
- Adobe Indesign
- Adobe Illustrator
- Prezi

8.5 Critical Cross-field Outcomes

The critical cross-field outcomes include, but are not limited to the following in the context of multimedia and in particular multimedia design:

- Identifying and solving problems by using critical and creative thinking.
- Working effectively with others as a member of a team, group, organisation, community.
- Organising and managing oneself and one's activities responsibly and effectively.
- Collecting, analysing, organising and critically evaluating information.
- Communicating effectively using visual and language skills in the modes of oral and written persuasion.
- Using science and technology responsibly, effectively and critically, showing responsibility towards the environment and health of others.
- Demonstrating an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
- Contributing to the full personal development of each learner and the social and economic development of society at large by making it the underlying intention of any programme of learning to make an individual aware of the importance of:
    - reflecting on and exploring a variety of strategies to learn more effectively;
    - participating as responsible citizens in the lives of local, national and global communities;
    - being culturally and aesthetically sensitive across a range of social contexts;
    - exploring education and career opportunities;
    - and developing entrepreneurial opportunities.

9. STUDY UNITS/STUDY THEMES

9.1 Specific Outcomes

TOPIC SEQUENCING		
TERM	**TOPIC AND CONTENT DISCUSSION**	**LEARNING RESOURCES**
TERM 1	SEO Content creation: This topic is focused on the student their niche in the multimedia industry. This subject area supports the Professional Portfolios and Multimedia Design Projects topics and allows the students to create compelling content that will drive visitors to their websites. It draws on learnings from the first and second year of study. Students will develop a website that fits with brand and will be used to house their portfolios in the second term.	Prescribed texts. Library resources and various websites
TERM 2	Professional Portfolios: Students will extend their learnings on brand identity and apply this to the development of their professional portfolio. In addition, students will engage with the purpose and value of the portfolio, the significance of showcasing their work, how to support their design projects for the best possible degree of engagement with different target audiences.	Prescribed texts. Library resources and various websites
TERMS 1 & 2	Multimedia Design Projects: In groups, students will design, develop and produce a suitable and professional multimedia product for an NGO, NPO or CBO in need that will assist the organisation in showcasing the work that they do. This project will be one of the major multimedia design projects to be included in the professional portfolio. This subject area will include content on project management, project reporting, and risk and change management.	Prescribed texts. Library resources and various websites

9.2 Assessment Opportunities

In this subject different methods will be used to see the extent of what you have learnt from attending classes and engaging with the course content.

- You will be asked to demonstrate you understanding of course related theory or apply your knowledge in a practical manner. You will demonstrate your learning on a continual basis i.e. through various small written or practical tasks.
- Some of these tasks or assessment will be awarded marks, while others are designed to provide you with feedback. You can use the feedback you received to understand how well you are learning the subject content and how you can improve on any weakness identified by your lecturer.
- Assessments will take the form of written assignments and essays, practical demonstrations of your understanding like when designing a website or an image, oral presentations, take home exams and group based projects. Your understanding and application of various concepts are seen as most important and not your ability to memorise facts, the assessments in this subjects will therefore help you to demonstrate this more effectively.
- You may be given the opportunity to complete your assessment individually, in pairs or in groups.

9.3 Assessment Criteria

Assessments will be graded against criteria applicable to problem solving assignments:

THRESHOLD	GOOD	EXCELLENT
GATHERING AND ANALYSIS OF INFORMATION		
Uses the obvious sources to get information showing some investigative skill to find them. Few sources used.	Uses additional sources of information, apart from those given, showing investigative skills.	Evaluating and comparing of different sources of information. Additional information gathered as solution develops.
There is some assessment as to what more or different information may be needed (completeness), though information found may be slightly incomplete.	Gives some sort of assessment of the information as to its completeness and its relevance and accuracy.	Manages to assess the quality of the information (this is good information because …) in terms of that particular area of interest.
PROBLEM SOLVING APPROACH		
Basic actions to achieve solution identified. Implications of actions not always considered. Some unrealistic expectations.	Actions identified are realistic and sufficiently detailed. Thought is given to implementation.	Evidence of pro-active planning, i.e. all implications anticipated and considered.
Solutions suggested indicate limited understanding of problem. Only typical solutions proposed or existing solutions copied. Constraints tend to limit possible solutions.	Typical and new solutions proposed through idea generating processes. Adapting of existing solutions	Solutions show innovative approach to problem Solutions show integration and transfer of knowledge between problems. Building on from existing solutions. Unlike threshold, constraints used to innovate.

9.4 Self-study Activities

- Various weekly tasks will be set and you will be required to complete this either individually or as part of a group outside formal classroom time.
- Use extensive learning resources which you are required to source using the institutional library and the Internet.

10. LEGAL UNDERTAKING (COMPULSORY)

Registered students of the programme are required to accept the terms, conditions, rules and regulations set out in this guide as well as by the institution by signing the online form found on MyClassRoom.CPUT.ac.za.

10.1 Example Form

STUDENT NAME:		
STUDENT NUMBER:		
SUBJECT CODE:	MUD360S	
LECTURER NAME:	Meagan Hamman	
I undertake: • to comply with all the rules and regulations, including the disciplinary rules, of the Cape Peninsula University of Technology (CPUT). • to familiarise myself with and adhere to all the rules and general regulations applicable to all aspects of the subject as detailed in the CPUT rule book and this Subject Guide. • that I will go through all the lessons loaded on MyClassRoom.CPUT.ac.za. • that I will engage in classroom and practical sessions, and ask relevant questions to the subject matter. I acknowledge that I am aware of the CPUT's policy and regulations regarding plagiarism and honesty in academic work.		
SIGNED AT:		
ON THIS DAY:		**OF 2019**
STUDENT SIGNATURE:		

Appendix III – Invitation Letter and Research Questions To The Interviewees

Dear (Student)

I am conducting informal interviews as part of a study to improve our understanding of how Multimedia students learn so that we may improve our curriculum.

As a Multimedia student you are perfectly positioned to provide valuable, first-hand information in the form of your own experiences and opinions. Please note that these are informal interviews. There are no right or wrong answers. I simply wish to understand what your view is on how Multimedia is taught and whether you have certain preferences when it comes to the subjects that you study.

The interview takes around 30-40 minutes and is very informal and your identity will not be revealed. Each interview will be assigned a code to ensure that you remain anonymous during the analysis and subsequent write up..

Please note that participation in this study is voluntary and therefore there is no remuneration for participation in this study. Your responses will help us to improve the way we teach Multimedia for future students so your contribution will be highly appreciated.

Note, too, that quotations and references to the interview might appear in conference papers, proceedings or published articles but without any identifying information. You are welcome to request electronic copies of any paper produced on the study.

If you agree to participate please suggest a time and day that is most convenient for you and let me know if you have any further questions.

Thank you.

The questions I shall be asking surrounds the following typical scenario:

Web design and development of a dynamic web site depends upon a number of skills, that, for the purposes of this study, have been mostly categorised into two broad areas: Design and Technical Development. These are reflected in the table below. Please assist by answering the questions that related specifically to these two areas and specifically for web design and development.

Front-end Design Skills	**Technology and back-end development Skills**
1. Determine the purpose of the web site 2. Determine objectives of the site 3. Identifying the audience 4. Produce requirements list. 5. Design information architecture a. Plan and organise site layout, navigational structure b. Plan for content sourcing/production c. Consider accessibility d. Consider and plan for deployment platform 6. Design and produce pages a. Interface Design b. Apply graphic design principles: Colour theory, layout, typography, grids c. Identify, source, produce elements for the pages i. Employ different image types ii. Use image editing programs to create, edit, optimise and export image elements d. Use typical web authoring software for page/site creation e. Design mockup for interaction (where needed) f. Select content for site g. Use appropriate colours, typography 7. Complete proofreading and editing 8. User feedback, testing, deployment, testing	1. Develop the coding and database specifications for the project 2. Apply web programming techniques which include: OOP principles, data structures, algorithms, program design and architecture 3. Design database structure 4. Develop client-side components (HTML, CSS, Javascript, AJAX, JQuery, Frameworks) a. Plan and flowchart interactive elements b. Use appropriate and typical development and testing environment for coded elements c. Deployment and browser testing 5. Develop server-side components (PHP, MySQL, FTP) 6. Server setup 7. Hosting, domain registration 8. Deployment and testing

- **Questionnaire (Students) – learning experience**

1. Are you comfortable with working with both design and technology?
2. Do you have a preference for design or technology?
3. Do you believe, from a career perspective, that you should be able to be competent in both? If yes/no, why is this?
4. Do you prefer to be a specialist or a generalist? Why? If specialist, what area do you want to specialise in? Why?
5. Are there basic, essential skills that exist in both areas but allowing you to specialise later? If yes, what do you think they are?
6. Within your curriculum, do you think that core competencies in design and technology are supported? Expand? How so…etc
7. Do you think that you have a noticeable preference for either Design or Development in your programme?
8. Are there other considerations other than technology and design that are important? If yes/no, expand and explain
9. Does the context in which you operate force a particular bias Do you think that in your class and in projects, you are forced to work in one area more than the other?
10. Do you think you are born with a predisposition to one, the other, or both
11. Socialisation: Do you believe that multimedia professionals need to be able to work as individuals, in a team or both?
12. Would a balance of competencies be more important than discrete competencies in these cases?
13. Utility: What is the purpose of multimedia products – function/form or both? when you visit a website what is important to you – information, visual, interaction, etc?
14. What do you believe is the most important aspect of this course? And why?
15. Is there anything else you'd like to comment on, contribute or go back to?

- **Questionnaire (Staff) – curriculum design**

1. Do you think that your students are comfortable with working with both design and technology? If yes/no, expand
2. Do your students have a preference for design or technology? What evidence do you have to support this? Give an example? etc
3. Do you believe, from a career perspective, that your students should be able to be competent in both? If yes/no, why is that?
4. Do you think that your students have a preference to be a specialist or a generalist?
5. Is there a minimum core competencies that exist in both areas but allowing your students to specialise later? If yes, what are they?
6. Within your curriculum, do you think that core competencies in design and technology are adequately supported? Expand
7. Is there a perceptible bias towards either in your programme? If yes/no how/why so?
8. Are there other considerations other than technology and design that are important?
9. Is there anything else you'd like to comment on, contribute or go back to?

a. Questionnaire (Industry) – Industry practice

1. Do you think that multimedia practitioners are comfortable with working with both design and technology? If yes/no, why is that? Expand
2. Do you find that multimedia practitioners have a preference for design or technology? Explain
3. Do you believe, from a career perspective, that graduates should be able to be competent in both? If yes/no, explain
4. In your experience, do you find that practitioners have a preference to be a specialist or a generalist
5. Is there a minimum core competencies that exist in both areas but allowing practitioners to specialise later? If yes, what are they?
6. Within the curriculum or instruction at University, do you think that core competencies in design and technology are adequately supported? If yes/no, expand
7. Do you find that graduates display a perceptible bias towards either in the programmes they're trained in? If yes/no, can you explain why find this? Can you provide an example?
8. Are there other considerations other than technology and design that are important? Explain/expand

Appendix IV – Ethics Approval and Institutional Consent

Cape Peninsula University of Technology

Office of the Deputy Vice Chancellor:
Research, Technology Innovation & Partnerships
Bellville Campus
P O Box 1906
Bellville 7535
Tel: 021-9596242
Email: NhlapoC@cput.ac.za

6 June 2016

Mr Wendal Koopman
Faculty of Informatics & Design
Cape Peninsula University of Technology

Dear Mr Koopman

RE: PERMISSION TO CONDUCT RESEARCH AT CPUT

The Faculty Research Ethics Committee received your application entitled "A whole brain paradigm for the training of multimedia practitioners", together with the dossier of supporting documents.

Permission is herewith granted for you to do research at the Cape Peninsula University of Technology.

Wishing you the best in your study.

Sincerely

APPROVED
Chair Senate Ethics Committee
06 JUN 2016
Cape Peninsula
University of Technology
Sign: .....

Cape Peninsula University of Technology

Introductory letter for the collection of research data

Wendal Koopman is registered for the M Tech (IT) degree at CPUT 196093236). The thesis is titled A WHOLE BRAIN PARADIGM FOR THE TRAINING OF MULTIMEDIA PRACTITIONERS and aims to explore the dimensions of an instructional design matrix that informs training to improve whole brain engagement in academic engagement and therefore to inform multimedia practice. The supervisor(s) for this research is/are:

APRF B.M. Alexander

In order to meet the requirements of the university's Higher Degrees Committee (HDC) the student must get consent to collect data from organisations which they have identified as potential sources of data. In this case the student will use interviews to gather data.

If you agree to this, you are requested to complete the attached form (an electronic version will be made available to you if you so desire) and print it on your organisation's letterhead.

For further clarification on this matter please contact either the supervisor(s) identified above, or the Faculty Research Ethics Committee secretary (Ms V Naidoo) at 021 469 1012 or naidoove@cput.ac.za.

Yours sincerely

APRF B.M. Alexander

2016-04-18

<<On company letterhead>>

I Bennett Mathew Alexander in my capacity as Head of Department of the Department of Information Technology at Cape Peninsula University of Technology give consent in principle to allow Wendal Koopman a student at the Cape Peninsula University of Technology, to collect data in this company as part of his/her M Tech (IT) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	**Conference paper**	**Journal article**	**Research poster**
Yes				
No				

_____

_____

<<Insert name>> *<<insert date>>*

Appendix V - Examples of Student, Staff and Industry Transcripts

Transcription
Staff code: L2
Duration: 00:40:51

W: Interviewer
L2: Interviewee

[START 00:00:00]

W: Okay [name], thanks for joining me here today. Could you please state your name and surname for the purposes of this recording?

L2: My name is [name]. I'm a second and third year multimedia lecturer at CPUT.

W: Do you consent to doing this interview with me voluntarily?

L2: I do consent.

W: Thank you. What are the subjects that you teach in multimedia right now?

L2: The subjects that I currently teach are multimedia practice for the second year level and third year level, and on the second year level I teach multimedia application fundamentals 2.

W: Do you mind just briefly discussing the focus of your subjects and perhaps even the types of topics you deal with there?

L2: Sure. On the practice subject, we deal with a variety of subject matter. The course is based on principles and concepts of design and the utilisation of software in achieving outcomes and outputs for the students in the design process. We go through topics ranging from web technologies to creative direction, art direction, photography. On the second year level we introduce the students to base concepts of design. On The third year level we cover a lot of those topics, but on a more intermediate to

advanced level. We try and create a usable portfolio that the students can take into industry and that they can showcase what they can do through the three years that they've been here at CPUT in the National Diploma.

W: Typically, what are the sort of artifacts or things that they produce?

L2: They can produce anything in a digital or a printed version - poster design, animation, logos, front end web design. In some of the other subjects they tackle SEO compliance and some programing technologies. But in my subject I teach them the concepts of utilising software to tell a story, utilizing design principles and concepts to formulate narrative story structures in order to produce an output, whether it be for a digital environment or a print environment.

W: Now, you've also worked in the industry in let's say the creative industries.

L2: Yes

W: Do you briefly want to just go through that? I don't need you to be exact in terms of dates if that is difficult for you, but just where you've worked and what kinds of work you did there.

L2; Okay. In the early 2000's I started out at Old Mutual doing a lot of brand development, front end web design and just little bits and pieces when it comes to graphic design, so it was basically graphic design that I was doing. I did that for about two, three years and towards the latter part of my career at Old Mutual, I went a little bit into motion graphics and graphics for television, whether it be for Old Mutual advertisements which was broadcast nationally, or internally, which was utilising the [Teepos][00:04:20] area - so, Old Mutual branding. From There I moved into photography for two years. By this time I had moved overseas to the UK. From there, my skills took quite a sharp turn towards the positive and I started working more in television and film. At this time I was overseas, I was in the UK, I was in Germany, I was in Singapore, just travelling and working, just trying to gain knowledge. But mainly focused on advertisement development of tv. I started in special effects for movies, and ja. Coming back to South Africa about 10 years later, I worked on some low profile

to high profile projects, ranging from things that were broadcast internationally and nationally, but mainly surrounding visual effects, motion graphics, animation, and I'd say about 25% branding for films and tv development. And then afterwards I was fortunate enough to get a teaching post where I could pass on my knowledge to the students at CPUT.

W; And You formal studies, you've got sort of an advanced diploma?

L2: I've got and advanced diploma in multimedia design and production, which I obtained at City Varsity. I also did a year of IT at CPUT many, many moons ago.

W: Okay, that's interesting about the IT part. I'll come back to that,if I may.

L2: Okay, ja.

W: So the questions really are around curriculum and how students deal with our multimedia curriculum. Do you think that your students are comfortable with working both in design and technology?

L2: I think that they are comfortable to a certain point. What I've Noticed it is that students, if it forms part of the course they actually have to do it. But for certain parts, they don't particularly like it or thrive in it, depending on what it is. Some students like web design, so they will thrive or appreciate the technology side of things. Other students prefer bradnign or motion graphics and they will thrive more in the design sides of things. But when it comes to programming or visual interpretation or visual design. It's a fairly even split in that they can manage both areas fairly well, and I think that's simply because they have to do it.

W: That's quite good. Okay, so do your students have a preference do you think, for either design or technology? And if you have some examples of students that you can mention where this is evident to you.

L2: One thing I've noted in the four years that I've taught here at CPUT, is that it's almost always split amongst design for screen and print, and design for web. On the

first day of my second year course, I always go around the room and I ask students what are they passionate about, what inspires them, what made them do the multimedia diploma. Almost always it's a half-half split between website design or front end design versus branding, logos, filmediting, special effects animation. The students tend to gravitate towards what they have been exposed to or inspired to, coming from school or just in their general lives.

W: Do you notice anything by way of the back end programming coming through in terms of the preference as well?

L2: When I speak to the students they absolutely do not take to the back end part of design. Because when you ask students what back end is, the first word that comes up would be databasing, and most students when you look at their faces and their body language and you hear how they speak about it, it's always very closed off. There's always a negative context when they talk about it. In them being in the multimedia field,they've sort of chosen creativity, whereas they feel when I speak to them that the back end, the heavy programming side is very restrictive in their ability to be creative, in their ability to think outside of the box, to do things in different ways... whereas maybe to them at that particular point,program would be very left brain, very heavily rule oriented criteria that they don't have the flexibility to sort of express themselves.

W: So from a career perspective, do you believe that students must be competent in both design and technology?

L2: Absolutely.

W: And when I say technology, I mean all the things that you do in terms of the practical sense, but also in terms of the context of the project where you've got scripting and programming as well. Do you believe they should be competent in that as well as design?

L2: I do think they should be competent in both fields, because inevitably the two do mesh well together. In today's world, just from being in the industry, there's no one hat

that any designer wears. You're generally a jack of all trades so to speak, and an employer values your ability to use both sides of your brain, left and right, the logical and the creative. And for students to be competent, or semi competent, or somewhat competent in both the technology side and the design side only enhances their ability to thrive.

W: Sorry to cut you short there.

L2: No, no.

W: Which leads me to the next question; The industry itself lends itself to the possibility of people starting their own businesses or working in large companies, like your Media24's or whatever, and you've had a huge amount of experience in terms of moving around in the different industries.

L2: Absolutely

W: Do you think that students have a preference either to be a specialist, or ageneralist?

L2: I think there are opportunities for students to specialise. Towards the tail end of my career in industry I specialised more, but that was only because in the beginning of my career I was more of a generalist. I sought out to be a generalist, because then I could know exactly what I needed to do in order to focus in any one particular area if I wanted to go that route. I did programming, I know Python, I know C++, I know Javascript to a certain extent, and I knew that that wasn't what I wanted to sort of do. but could still utilize my experience in knowing those kinds of things in my design, in the creative side of my career, because inevitably some of the creative programmes that they use, you can utilise programming language to maybe design third party applications. You can can use them to design little programmes within the creative applications. Especially if you're moving to something like a 3D based environment, it relies heavily on the Python language, which is more generally accepted now than it was before to create these little apps. And from a business point of view, if students know both the technology side of things as well as the creative side, they are well

suited to creating maybe little applications or little things that could maybe enhance their business, that they could sell, or they could offer services to clients that maybe other smaller companies don't have. So they'd be well suited, or they'd be well situated to offer a variety of services. Especially being a startup, where we know that a lot of start up in the first year, they generally either fail or struggle. So the more services you can offer based on the amount of knowledge that you have, both on the technological side and the creative side, will only hold them in better stead.

W: Okay. Now do you think therefore that there are a minimum core set of competencies that exist in both what needs to be done in design and what needs to be done in technology, but that allow student sot specialise later?

L2: I can't really speak to the technology side and the programming side because I have little experience with that from an academic teaching point of view, but from speaking to my colleagues and speaking to students... The basics that they learn that I've Been told about, I think there are competencies that they acquire that I think will do them well in the long run. Sorry, I forgot the question. I think I'm a bit off the question.

W: No, really I was just trying to figure out whether there are core competencies that exist in both areas that you consider that students would need to do, but that allow them to specialise later?

L2: Yes, there are definitely. As I said before, you know, the two can merge well with each other because those competencies that they learn, both on the creative side and the technology side... The principles and the fundamentals that they learn with regard to their thinking processes, it allows them to broaden their horizons to allow them to engage with any technologies or any creative technologies that they are not aware of inside the classroom environment. And when they get exposed to it on the outside, in the outside world or in industry, they are able to latch on or learn things a lot quicker, just simply by having those core competencies embedded in them already.

W: Okay. Now, having said that, whiting your curriculum do you think that the core competencies in design and technology are adequately supported in terms of resource, in terms of time, in terms of exposure?

L2: I think in terms of exposure, from my experience and from the way I've curriculated things, I think I do provide the students from a second year level enough of the basics to give them core competencies in design. The only gripe that I do have is because design is an ever evolving and ever changing phenomenon, I do think time is always against us. There's only so much you can do in four 45 minute periods, and especially when the students have a workload of 10 to 12 subjects and they don't really know things like maybe time management, these core concepts can maybe sort of just fade but the wayside depending on what takes preference with regard to the assignments load. So time is always against us. Especially from a multimedia perspective whether design practice or the technology, I do think that we provide them with a core understanding of what they need to do, and from there, talking to the students, they have gone out on their own because of the passion that we've tried to instil in them and for the subject matter. They have actually gone out there and researched and learned about other things, but they have the core values ingrained in them already. Did that come outright?

W: Yes, no, no, no, thank you. Do you think that the way you teach it, and this is just an opinion that I'm asking for, the way you teach it influences whether they have a preference for the things that you teach?

L2: Absolutely.

W: So, you've already alluded to the fact that there appear to be a bias towards the animation and the design in your view...

L2: In [inaudible][00:17:53].

W: Okay. Do you think that if programming, or scripting, or databases was taught in a different way you'd have a possible even split?

L2: Oh no, definitely. One thing that I've always noticed since I've been teaching is the more you emphasise what you teach, or the things that you are passionate about, that has a direct bearing on the students mindset. Look, if people come to multimedia they

expect a creative engagement. If they go to application development, they expect a more left brain, logical environment. But that doesn't necessarily hold true in a general term. With anything, it can be forestry or flower arrangement, if you have passion towards it and if you teach it in a way that can relate to the students, they will grab hold of it with both hands and run with it. the one thing that I Have noticed, just from my personal point of view is that, as a lecturer and as an educator I need to stay current with what is available technology wise, in order for what I'm teaching not to seem old hat, because if you regurgitate the same things.... These kids nowadays, they're so on it because they're exposed to a variety of things, and unfortunately there's not longevity in anything. People find something new and shiny, they move onto the next thing. So if you're passionate about the basics and the general understanding of one particular subject matter, those kids will grab hold of it - whether it's logic left brain programming thing, or a left brain right brain creative thing. They will grab hold of it if you teach it in a way that they can understand that this is something worthwhile exploring, because they can see it in you.

W: So would you say that there's a strong component of motivation behind it?

L2: Absolutely.

W: Okay, so you've used this word left brain and right brain quite bit. Do you believe that people are either dominantly left or dominantly right? And the second part of the question is, can you have whole brained people, or does the concept of whole brain exist to you?

L2: I might be speaking very generally here when I say left brain and right brain, but I use those terms because I Think it's been accepted that, let's just say, in quotes, "programming" it would be more logical. So, logic is generally associated with left brain and if you're in a more creative environment you are technically associated more with something in the right brain sphere. I do think that the two can cross over, and you can have a concept of whole brain. In my years in industry, I've had to develop the ability to utilize my whole brain because every situation dictates that you approach a problem differently. I don't think, in my opinion, that you can have a successful outcome if you don't utilise both sides of your brain, because your experiences affect both sides of

your brain -your experiences in life, whether it be in a classroom environment or in a cultural environment or whatever. It affects both sides and both sides of your brain are informed by your experiences. So I do think that there is capability for students to develop a whole brain outlook on their subject matter, whether it be a perceived left brain logical activity, or perceived right brain creative activity.

W: Right, thank you for that. Leonardo Da Vinci, Renaissance man...

L2: Yes, awesome dude.

W: So you're aware of everything that he was able to do?

L2: I am.

W: Brilliant engineer, was able to sketch extremely well, and sculpt, was interested in the way the body functions and all of that. So, would you consider him a perfect example of a complete whole brain person?

L2: Absolutely

W: Now, do you think that Da Vinci's can be grown, or are they born?

L2: That is a bit of a difficult question. Let me clarify that. People are born with natural abilities, whether it's for their logic side or creative side, we are all born inherently with the ability to achieve greatness in whatever we choose to do. I do think that cultivation and growth leads people to become a Leonardo Da Vinci. I maybe be off base in saying this, but there is maybe a small section, and I don't have the knowledge to fully say this, but people are born with natural talent, but that natural talent can only take you so far. In order for you to become more proficient in anything, you need to work at it. If I may just relay a little bit of a story to you on this? When I was studying, my lecturer in my last year of study, she said to me that... I was never strongest in my design. I was never, ever a great designer, or strong, but she said to me that out of everybody she has the most faith in me to succeed in life, simply because I work at what I do. I don't have natural design instincts, but I'm willing to work at being a better

designinger, learning more, finding more about my subject matter. When natural talent takes you so far, and it takes you to a point where you need to innovate, and people with natural talent maybe can see past that. The innovativeness comes from maybe people that work beyond their natural talent. So they learn more, they integrate more variety into their knowledge so they can make assumptions and make developments better based on what they need to do. And that's why she said that I would succeed more, because I work hard at it, which was a nice thing.

W: Great. So would you say that students in our programme can all reach a minimum core competency in subjects considered left brain or right brain, but that that they will choose a direction in which they would want to develop themselves? And, there's a second part to the question, would you naturally have virtuosos then that would be able to achieve equally well in both areas?

L2: I do think think that, especially from what I know on a second year level, they obviously get introduced to all the subjects, Communication Networks, Application Development and Multimedia. So they are exposed to everything, and I think this goes back to your previous question. If there;s not passion for it or if it's not taught in a specific way that grabs the students attention, they won't really worry with it. Can I be frank, can I be honest?

W: Yes, please do so.

L2: I've engaged with student in my third year subject, Multimedia Fundamental Applications, and my strongest students have always been not my Multimedia students,but my Com Net students. And, that is simply for the fact that, students have said it's because of the way maybe I teach. I teach theoretical concepts visually sometimes, so they can relate to it, even some of the application development. One thing I have gotten from the Multimedia students is that, when it comes to the programming languages and things, they can't really comprehend it because it's taught in a way that is, for lack of a better word, boring. So they don't grab hold of it. In our Multimedia domain we have a programming part, but the lecturer engages with them and there's practical examples, so they can grab hold of it. Whether they're proficient in it or not is another story, but they can relate to it so it's not just a grind. They can

actually enjoy it to a certain extent. But when it comes to the virtuosos... Just as an overview, I think people gravitate towards what they're passionate about. I have students in my class that, even though they can see the passion in what I do, they don't gravitate towards maybe an animation, or a branding, or photography or anything like that. They would go more towards things that are SEO based, or web language based, or front end based, regardless of the lecturer, simply because that's what they initially associate Multimedia with. They got exposed to that, so they would find more fulfilment in that going forward. They can maybe use concepts and principles from my subject, but that will still be their primary focus, and no matter what I do or teach them, or how passionate I am, if they've made up their minds, that's just the way they're going to be.

W: Great. So, do you think that other than technology and design, there are other things that are important in terms of what needs to be in the curriculum?

L2: I do. One thing that I've always, in the time that I've taught here, and that I thought was, not lacking, but there was less of coming from the lecturer that I took over from, who is a brilliant director and a brilliant film student and lecturer...There wasn't as much practical art direction as there was theoretical art direction. How you incorporate principles of design such as composition and light, how you incorporate that in a practical environment. The theory is great and there is definitely a space for that, but if you don't do both...

W: So the application of this?

L2: The application of the theory, ja.

W: Designing principles and theories. But apart from those concepts now, design theory, design practical and technology in programming, are there other things that we need to consider that are important for the curriculum?

L2: Yes. New age concepts, such as virtual reality. I do think that this programme would benefit greatly from going into the 3D space.

W: 3D rendering?

L2: 3D rendering, modeling, art direction. The reason why I say that, because the 3D environment draws on the basics of 2D design, whether it be print or screen. The principles carry over, and you can utilise those principles to maybe quickly put together something like, for instance, a 3D storyboard, where your client might be a visually based person, or your student or lecturers might be a visually based person. Instead of just talking, or maybe presenting something that is possibly uninspiring, it could be more engaging in the fact that there's more colour, there's more motion. I always use the phrase with my students, "A picture's worth a thousand words", and if you have more tools available to you to produce those thousand words, you are spoilt for choice and you can offer more. And I think we can offer the students more if we give them those extra tools.

W: Okay. Other than design practice and technology subject, what else do you think contributes positively towards the curriculum as a Multimedia student?What other subjects do you think would be...?

L2: I think design analysis, from a purely theoretical point of view, in the fact that while students can participate in practical understanding and theory concepts that are put forward to them, I think a spot where they can actually analyse existing data, existing designs and then present them, whether it be to lecturers or to peers, or maybe have a small symposium to the general domain or the faculty... But to increase their understanding of design itself, of media in a general environment, I think they need more analysis driven subject matter.

W: Okay, thank you. If you were told tomorrow that you can't teach the practice subject anymore, nor the fundamental subject, and that you have to start teaching PHP, how would you respond to that? Not that it's going to happen, I'm simply asking if this were the case.

L2: Because it's not a passion of mine, I wouldn't grab it with open arms. I would be dejected quite substantially, because I'm used to visualisation of things and PHP, while there is some slight visualisations that you can achieve, but there's no creative end

result. I'm a creative person and if I can't express myself creatively, I would [well dead][00:33:23], so to speak. I'd have to do it and I would be able to do it simply because it would be my mandate going forward. I don't think I would initially thrive because it just wouldn't be fun, and it would be, can I say the antithesis or the opposite of what I'm used to teaching and what I'm used to experiencing in my career. It would be completely the opposite, so I would not enjoy it at all. The word I think would be non-enjoyment.

W: Okay, thank you. In relation to the conversation we've just had around the curriculum, the way the curriculum is presented, the students preference, or potential preference or bias to different subjects and content matter, is there anything else you'd like to comment on or go back to that you feel we may have missed?

L2: Well, one thing that I've experienced in the entirety of my career is in design or in any creative technology, whether it be Multimedia, New Media or whatever you want to call it, there's always been a sense of collaboration. And I find that in this particular department, in the IT department there's a lack thereof. People sort of work in pockets, and you know, you do what you do and I do what I do, and we leave it at that. There's no real collaboration. We had a meeting last year where we sort of went through all of our subject matter, and even though in my one subject Iteach all three streams, some of the App Dev lecturers were surprised by what I teach, which is like fundamentals of accessibility... All things that can be considered part of programming and things like that. They were actually surprised by it, because they simply didn't know that even though those are design concepts, they still have theoretical and practical application both in a classroom context and in real world context. There's just not a lot of cohesion when it comes to amalgamation of all the subject matter.

W: Seeing it all together.

L2: Ja.

W: But then would you say the way the integrated project is done in Multimedia is an example of how we try and bring those different areas together in a collaborative way?

L2: Absolutely, because the way it's structures is you have one umbrella which encompasses the entire project itself, and that project is made up of the various subject shta is in Multimedia. It's a culmination of everything that the students have learned and applied in the project sense, so that the output is representative of each subject. Whether it be the far creative side or the far technical side with regard to programme, everything is represented there, and the output, whether it's good or bad depending on the students, every single subject is represented in that project. So I do think that yes, the way Multimedia does their project subject is a good indication of how collaborative learning can be achieved.

W: Okay. You've also done some interesting things with the second and third years. Do you just want to go over what that was about and what your perceptions were of the outcome?

L2: Okay. In 2018 I started a pilot programme just with a collaboration between the second year Multimedia students and the third year Multimedia students, where I would get them together in a room, no computers just purely talking, and I would divide them into their groups, which is a combination of second years and third years. I would give them subject matter. They would need to go away, do analysis, discuss amongst themselves criteria which I have given to them that they need to analyse, and they needed to present their feedback to the class, what their thoughts were on the design, on whatever analysis they came up with. It would be a movie poster, it could be a particular artist, or it could be a photograph or whatever. And, from the data that I've gathered in the one semester that I did it, the students, whether they were second year or third year, they actually came together to sort of learn from each other. And when they presented there was this even keel of talent. Nobody sort of took control, everybody presented their thoughts on what the consensus of the group was. There was no "I thought this was better", or "I thought this was not great". They had to come to a general consensus of what the design was of the criteria that I gave to them, and they presented it in a way that was collaborative in nature. They pooled their resources, their design thinking, whether is was second year or third year, and they came to the consensus, and they collaborated, they presented, and to the students that actually listened to it, hopefully they learned from it or they took some more knowledge away from it. And not only does what I did last year hopefully help them

from a design analysis point of view, but it also teaches them certain soft skills, like presenting, how they present to a crowd. Because, basically they had to present to a panel, which was myself and the class. So it made them comfortable in that space. Not just from a presenting point of view but from an analysis point of view as well. And they could ask questions without fear of sounding, in quote marks, "silly" or there was no right answer. It was design oriented, it was analysis. And, from what they've told me they actually enjoyed it, and hopefully I can carry it on in 2019.

W: Great. Well thank you so much.

L2: You're welcome.

W: I think that concludes what I needed to have a discussion with you about. Thank you for your time.

L2: You're welcome, Sir. Cool.

[END 00:40:51]

Interview with Industry practitioner P2

[W]: [P2] thank you for doing this, for the purposes of the recording please, do you mind stating your name and surname?

[P2]: [Name].

[W]: Do you agree to do this voluntarily with me?

[P2]: I do.

[W]: Also do you agree that, or consent to the content of this being used in formal research, conferences and papers without any personally identifying information?

[P2]: Yes.

[W]: Thank you. [P2] you have been through the multimedia program, you graduated as a multimedia practitioner and you also have taught on the program for a number of years, which really lends a very unique perspective to the set of questions that we are about to go through. So I am trying to understand how our students engage on leaving our program, and with the intent of informing our curriculum and how we engage our students in future. So you have worked in the industry for a while, you have worked in various parts of the industry. You have done a lot of online work and if memory serves me correctly you doing training right now, writing for training, writing for training online. Is that correct?

[P2]: Hello.

[W]: Hi.

[P2]: Yes, sorry you just broke up there for a second. Yes I am officially my job title is a learning experience designer.

[W]: Okay.

[P2]: So like a user experience designer, but for learning.

[W]: Okay, brilliant.

[P2]: Yip.

[W]: Okay so you recall we had exposed you guys as students and of course you have been in the industry for 15 at least years?

[P2]: Yes.

[W]: Ya and you had been exposed to a range of subjects and these subjects extended from informatics which is programming, technology which is related to web development and backend development, and then you also had your design aspects okay. So within the context of say a web development project, where let us say you dealing with a content

management system like WordPress, you have got frontend, you have got user experience, you have got user interface design, you have got logo design, you have got typography, you have got color choices, you have got placement and then you also have the backend, you have the coding, you have got the pHp, you have got the MySQL, you have got JavaScript. I am using that as a context right now. So understandably we expected our students to have sum sort of competence in all of those areas. Okay.

[P2]: Yes.

[W]: So do you believe that, or do you think that multimedia practitioners leaving our program are comfortable in working in both the design space and the technology space equally? Or do you think there is a preference or perceptible bias to either?

[P2]: I think that what I really liked about the course is that it did give you exposure to things, like actual practical exposure to tick both sides, if I can just call it, in very sort of, more simplistic terms, two different aspects like the creative aspect and the more technical aspect, but it is quite clear that there is, to me at least, that there are…most people choose one or the other as a preference because of their own affinity, before they even probably stepped in. It is just something they are able to do better than the other. So there are a few, I think there is, I do not even know what the percentage would be, that can stand you know on both sides of that drive and say that they can do you know equal amounts of… or their abilities span across that spectrum, but I would say most would have like, maybe 70/30 split as opposed to 50/50 you know. Does that make sense?

[W]: No it makes a lot of sense and it is interesting because I am noticing certain trends come out in my conversations with staff, students and people in industry. You use words like affinity and you use words like preference which is coming through quite strongly for me. You have also mentioned that there is a small percentage that seems to be able to span across the continuum which is also consistent, it appears, from what I am hearing and what I am seeing. If I think back to your days I think of a…I think he was in the year after you for example, I think of a [student name] for example who was a brilliant designer but is…was also a brilliant coder. Then there was [student name] for example who could cross very well across either spectrum or parts…side of the spectrum, but do you think though that from a career perspective, the people that we exit out of the program, that they should at least have some core or minimum competence in both areas?

[P2]: Yes they must. They cannot do... I mean if you are talking of a 3 year national diploma they cannot, you know they must have a basic level of, even the thing that they do not like doing.

[W]: Right, okay.

[P2]: You know the thing that they think they're bad at or the thing that they do not…they just prefer to do lesser of. They should have a basic ability within that field.

[W]: Do you think that that helps them to make better choices about where their strengths lie or because it will help them to perform in the workplace better?

[P2]: I think so. Another piece of the puzzle that I am bringing to you is the fact that I have got colleagues who were my students.

[W]: Yes.

[P2]: And I have got colleagues who are…some in the design space and some in the development space. They studied the same course, they did everything exactly the same. They exited the course, they came and they said "I want to be a designer" so we put them in design. "I want to focus on development" so we put them in development. Even the designers who say "I am not a developer" they, because we do eLearning development, it is not just…the design that they do is not just like flat communication design like a poster or a flyer or... It is actually an interactive experience. So one of my colleagues, Jared is his name, he would say "I actually do not know where I fit because I am not a great visual designer but I am not a developer," yet as an eLearning developer he is so valuable because someone else can do a concept and they can give it to him and he has an understanding of design. You cannot…he would say he cannot design nothing from scratch but he can take something that someone else has designed and then say like one screen of something and he can develop that whole course and understand layout, understand what works, and also create amazing interactions using custom code that other people cannot do. So in that sense, I mean there is …he is an amazing asset because he does have that understanding of both sides. Even though he would say "I am not a developer," but who knew a few years after he did not want to see any code that here they guy is sitting and doing coding.

[W]: Wow, okay, alright. Would you then call him a generalist? I am asking that question because I am trying to understand whether our students prefer to specialize on leaving here, or whether they prefer to have a generalist approach to the types of skills that they need in industry.

[P2]: It is such a so tricky very interesting topic obviously. You can dissect it any which way.

[W]: Look there is no right and wrong answer here. This is just both of us trying to understand. You having gone through the programme and being in the industry for so long. You have also done a BTech in Graphic Design which adds a new perspective altogether, and you have also taught on the program and you also are in a position of seniority to students coming from our program. So you have got a very unique perspective which I think is very valuable for us. So let us take a small concern, if you left multimedia and you decided to start your own business, would you want to then be a generalist or specialize in an area that you are comfortable in and call in people that are infinitely more competent than you in part, in an area?

[P2]: So if I was going to start my own business coming [11:30] hopefully I want to be able to do everything. I mean the point is it is almost like Cecilia, she has come out of the programme and what she is doing now is she is a project manager. So you need to…or

the unique perspective that the course gives you and exposure gives you is insight into what it actually takes. So people cannot come and tell you “no this is going to take me back or it is going to cost you R5000 because it is going to take me two weeks to do.” Having the actual practical understanding sets you up for a lot more success and less being taken advantage of especially if you have gotten your own business.

[W]: Right.

[P2]: I think it comes later on, well for me it came later on, where I felt it is time for me to hone in on one thing because that is what I as I got older and more mature started thinking about “What do I want my career to look like? What do I want to be doing when I am 50? What do I want to be doing when I am 60?” I need to visualize these things and me being happy doing this, this one thing and I made a very conscious choice of saying “I do not want to be a designer, a developer when I am 50.” I do not see that, that is not going to be fulfilling to me. So I decided to like veer into the content writing space.

[W]: Sure.

[P2]: Which I might add was covered in the course as well. So there was that multimedia skills subject that where I did that, exactly what I am doing now, I did it then. We did storyboarding for eLearning, you planned out your… you took a textbook and you converted it to a digital eLearning module. It is literally what I am doing right now.

[W]: No that is…

[P2]: so I love the exposure to all of those things because it meant that you make such an informed decision of what avenue you going to go into. It is not just like a leap of faith and saying “Oh I guess I am good at this, I will just do this.” I would never even have known about it. I would have been sitting there developing websites.

[W]: Okay brilliant. So if I am to understand your response now, which is essentially touching on to the next question, would you then agree and of course disagree with me if you want to of course this is just a conversation, that there were minimum core competencies that existed across the board in both design, development and in writing and so forth, that allowed you to go out into the industry to identify what you want to specialize in later?

[P2]: Hundred percent. I know for a fact that it is like that for others as well who have come out of the course. You know you can start out, you just leave and you start out doing one thing and as things progress and years progresses [15:20] you know you go back to that and you draw on that and you say “do I still want to do this or do I want to add a bit of this or a little bit less of this?” So it is extremely useful.

[W]: Okay brilliant.

[P2]: I think at the time when I was studying we did feel like the three years of all of the subjects felt a bit long. It felt like we could have done a year of foundation and then choose two.

[W]: Okay.

[P2]: We did feel like that at the time. I do not know if I feel like that now, but I think it is maybe important to just…especially if you are relooking or you looking at analyzing the structure of the course, the success factors and whatever, but that is something to consider "is three years too long for a general thing…qualification or…?"

[W]: But in those three years did you feel that there was, again look this is purely your opinion, your understanding and your feeling towards it, because yours will differ potentially vastly to someone else's and I am really trying to understand different feelings here, do you feel that the core competencies that were required in design technology and so forth you… they were adequately supported in your curriculum?

[P2]: Probably with the exception of the programming aspect. I mean that was Java at the time not even JavaScript it was Java and we even wrote the, I do not know if it was a certification exam, but it was some kind of special exam. I could get 70% on that test and I still could not hello world you know what I mean? I am serious the… and I think there were probably maybe two people in the class who were interested in that and the rest still had…and I think it did change over time right? Where it was more attuned to what the industry and the role would be more of. So you are looking more at web development as opposed to software development or whatever Java is useful.

[W]: Right. Yes absolutely, look I mean it has evolved, being the type of technology we deal with. So later on we started introducing your Php, your MySQL, your JavaScript which I am sure you would agree is more in line with the types of skills.

[P2]: But I mean otherwise definitely the things that were covered within the other aspects were extremely useful and even in the production space and the filming and the whatever else. That sort of thing was…it is so useful, you talking about cabling and just like the simple things in life like how computers sit together. You now coming into a space where you are, especially as female, you are, think of it… not really expected to know these things.

[W]: Yes.

[P2]: It surprises people that you understand how you know the, remember the RCA cables...

[W]: O wow I cannot believe you still remember those things. So you still understand the difference between the BNC and a RCA connection? which is really interesting that you mention that because just yesterday I interviewed someone at the city, and what I noticed was the predominance of males in the IT department still today and my question to that person was, do you know… is it your perception that within this IT space it is still very male dominated? And his answer was yes. So yah I can see that that is still happening.

[P2]: But I think that with what is happening in the web development of the role of the now what is called frontend developer having emerged I think that opened up a lot of doors

for females because it is coding but it is not deep in the code and it is still a level of, not design as such, but like design. You know what I mean?

[W]: Okay, so if we took…

[P2]: You not designing concepts but you are like implementing design and problem solving.

[W]: Yes.

[P2]: So I think a lot more females are going that route

[W]: So.

[P2]: So now as a lecturer what I saw in the third year there were a lot more females that were actually into front end development.

[W]: Yes and that is what I wanted to touch on. So if you took a typical web development project for a client okay, so the client wants a contact form, the client wants potentially something to schedule events, so there is a whole lot of programmatic aspects to that in terms of what needs to be done in the backend, but it also has to be the appealing to a particular audience, potentially age group 18 to 25. So there is a certain branding logo look and feel that goes with that alright. So there is a web development aspect, backend development aspect, there is a frontend development aspect. So people I found have defined themselves as frontend devs, backend devs and then also designers. So there are people like say your [practitioner name] that simply work in Photoshop and do only the design, and then you have someone that would now take that design, slice it and use the code to put it into a CMS type template. Now you have mentioned earlier on that there are a number of people, a small percentage, that is…that are able to span that entire spectrum of skill sets. Do you find that there is a bias in the people that you have seen coming into the industry that you are in, to one or the other? So do you find that people find that coming into the industry "you know what I am going to define myself in this thing called a backend developer or I am going to call myself a frontend developer. I am going to be purely a designer."

[P2]: Do I find that people are doing that?

[W]: Yes.

[P2]: Yes hundred percent definitely because I think that is also what industry is requiring. I mean that is what the jobs that are out there are saying. You know we want a person that can do this and we have terms of development and this is such an interesting topic again because there is so many different opinions on it.

[W]: Right.

[P2]: Do you want someone who can do everything or do you want someone that can do one thing amazingly.

[W]: Right.

[P2]: And let us say as a person who might be interviewing someone, I would objectively say that I would want someone who can do a little bit of everything and the ability to learn more that I would execute.

[W]: Okay, alright.

[P2]: If it was me, if I was hiring someone that is what I am looking for.

[W]: Do you believe that our programme prepares people for that?

[P2]: Yes I think so. I really do thinks so. There is, and I told the students this as well, because as a student I hated it at the time, later on it became a tool that I obviously used up until today which is research and development and teaching yourself, and taking ownership of your own learning, and that is one of the things that the course did teach me and it is set up in that way, and it must be set up in that way because you cannot possibly say that we are the be all and end all, as in the lecturers. You not the be all and end all. So you can never set it up like that because you will fail.

[W]: I know, absolutely.

[P2]: You create an expectation and it is the wrong expectation and we do not equip students to go out there and learn and develop themselves in the field that is currently constantly changing.

[W]: Oh no absolutely and I agree with you there.

[P2]: I think that is if it is given, for me it was a very conscious thing, but I explicitly told people that this is why it is like this, it is because it is to help you. It is one of those things that you hate right now, but you going to be thankful for it later.

[W]: Okay, alright. Just one question I want to address before going back to what you mentioned about affinity. Do you think that while you were studying and also while you were teaching, because you came back to teach many years later, was there a perceptible bias in the program to one or the other or was there a balanced treatment that spanned the competencies that were required?

[P2]: I would one hundred percent say, hold your breath, that there was no bias.

[W]: Oh wow, okay.

[P2]: No I honestly do not think that because I was more on the design side and you had obviously severed Ashraf on the development side, but I never felt like the course was set up in any way that would...

[W]: Okay, brilliant that is good to know. Okay I am going to ask you some possibly esoteric questions now.

[P2]: What? Make me question my belief system?

[W]: Is there a God?

[P2]: Possibly.

[W]: Alright, so there has been lots of discussion in the literature about this concept of left brain and right brain thinking, and people have always associated conventionally okay, there is no hard and fast rules to say that I have located where the left brain thinking is, but people have conventionally associated things like creativity, aesthetic, visual design and so forth with right brain activity, and have associated things like logic, procedural working and things like even just working with programming with left brain activity, and then people are able to span that space as… tend to be defined as whole brained. Do you believe that? Do you believe that that exists?

[P2]: Do I believe that exists? I feel like no. I do not think so and I think that it is one of those things that if people tell you, "oh you are this," then you just grow up thinking like "oh this is me, I am right brained so I am so creative," and on the flipside, "no I cannot design anything, I am not creative, I am left brained." So I think it is a blockage for people. They put themselves in a box or somebody puts them in a box at some point in their lives and they just "no I cannot do that, I can only do this," because people see it in isolation and it is only like the special few that can do both. "I am not this special few." I do not know if it exists or not obviously. I do not have a definitive thing, but I think the thought of it hinders more than it helps.

[W]: Okay that was very encouraging and interesting because you were saying something very similar to a couple of people that I have spoken to. So would you believe then that, and I am referencing this only because I know that you have got two kids alright, so would you say that there is a nurture aspect to this and the choices of terminology in terms of growing your kids has got an influence in how they view the world and their potential skill sets that they can grow in?

[P2]: Yes hundred percent. Definitely and you know people are always telling kids "you this" because they are trying to find, in a positive way, they are trying to encourage the children and really take the small things that they do and highlight it to them as being amazing and "you so great at this and you so great at that" and maybe down playing the other statistics that they might not be good at. But I mean ya I can see it even now, Kay would be like "no I cannot draw, but can you do this for me?" Like that she will tell me, she is 5 years old she is saying "I cannot draw" and I am saying "what do you mean you cannot draw? Everyone can draw just do it." Even at five she is like there is a right way and there is a wrong way. I am doing this thing and I cannot do it the right way and yes while there are right ways and wrong ways of certain things at school because they obviously teaching them to draw a face and where are the eyes on the face, where is the nose, where is the mouth, you know the placement of the anatomy and all of that. So there is you a right way and a wrong way but she knows where those things are. So it is more like a I do not know self-consciousness that she even has at this age.

[W]: Right and her confidence in visibilities and her socialization and peer pressure of course which I think is important. But if you look at some of Picaso's drawings, I mean those are not faces, they are barely recognizable as faces, yet it is considered art to the highest form. I do not want to bring in too much of my own perceptions in this because I am

needing to hear what you say, but I am very concerned about the way we socialize our kids in terms of the boxes and how those boxes end up being limitations in belief systems in what they are able to do. I recently, a while back actually, but I want to reference it here now for you as a parent, there is a book called "Drawing on the Right Side of the Brain" which is written by a doctor and again I forget her name, but she sets out to prove that everyone has the ability to learn how to draw. When you draw a little drew a little stick figure as a kid and people said well you cannot sketch or you cannot draw, you accepted that that was your fate, but what she sets out to do in this book is to actually prove that everyone has the ability to sketch at a very reasonable and acceptable level that would be considered a skill level of someone that has been schooled in drawing for a while. I must send you the reference of that book. It is actually quite interesting to read. It leads me onto my next question. Now I am going to exclude the extremes, I am going to exclude the virtuosos, the people like your servants that can calculate the exact day of a particular date in 2025 for example. I am going to exclude people that can calculate pi to the N^{th} degree. I want to ask you, and again this is an opinion, if you think about da Vinci, Leonardo da Vinci was able to be a brilliant sculptor, brilliant painter, he was an engineer way ahead of his time. He was doing engineering drawings for war machines for the precursor to the helicopter, for a whole range of things that…the technology did not exist in that time to build. He was also interested in how the human body functions. He was completely ambidextrous he could write with both his left hand and his right hand. Are people like that, in your perception, your opinion born or can they be grown?

[P2]: I actually have honestly grappled with this and gone from one decision to the other to the opposite many times because I want to believe that anything can be taught or more accurately anything can be learnt.

[W]: Right.

[P2]: Right okay and I think there was a book called was it "Talent is Over Rated" "Talent is whatever" but it is what you do with that.

[W]: So you were grappling with this concept of whether whole brain is something that one can train or be learnt.

[P2]: I think that maybe the affinity or the born naturally, existing behaviour or whatever makes someone different to the next, is that hunger for knowledge. Maybe it is not their talent or that they are special in any other way other than wanting to know more because knowledge is out there for you to find. All it takes is for a person to actually want it.

[W]: Right

[P2]: So maybe we can foster that and encourage that in our kids that in terms of ya I do not know whether you just born that way or not. I cannot possibly think that it is nature and not nurture. I choose to not believe that because then it takes the power out of your hands and you might as well just say "ah well"

[W]: This is my destiny.

[P2]: "I am not that guy. I am all I am ever going to be" and you are not, so…

[W]: Okay and look I do not need to include this into the transcript and I can exclude this from the recording of course, but I am just thinking about you, I am thinking of that first day when you walked into that little office that corridor that was an office and you had come from a tile merchant place if I recall correctly. Did you ever believe I… you would be where you are right now or was it that desire that you knew that you were something different, that you needed to be something different? The curiosity was there and this is just me asking you personally because it is making me think in a direction that I possibly have not considered here now.

[P2]: I think so…I have been working as an 'adminy' and sales person for five years. Receptionist, admin sales for five years and then I decided I cannot, I do not want to do this. I want to go study because my mother was working there and I was going to study for free. I could do that and I thought agh I cannot miss the opportunity to not take or to… I do not know what it was…whatever.

[W]: That is an important point because it is about accessibility to the resources that will help you improve. What makes one person able to be… flourish in an area that they did not realize was possible to them is the barrier to learning and that barrier for you had been removed because you had a parent that made it possible.

[P2]: Yes and then I also had…I was surrounded in my social circle with people who were doing other things. I did not have friends that were doing what I was doing. I was just making money. I had a child, I needed to work and that was it. My friends were, my friends were designers and … Kirk was my friend at the time and he was a graphic designer and my other best friend he was a graphic designer. So it was "oh there is other things that I can do" and one of the things in my, now I am going to sound like whatever… in my travels that I have really been amazed by, and what makes me love, besides all the other negative aspects of the States or the UK, what makes me love those countries is the feeling of I can do anything that we do not have here. It is like "these are your options" a, b or c and maybe it is different now with the new generation. Maybe it is different, but what I found there and even with friends there, there are people that are doing so many different things and they also motivating you to be better. The culture and the social aspect is so huge and then it is such an impact on how you improve in your own life. The people that you surround yourself with "do they push you to go up?" or do they just your same old same old every day and they sometimes even do not want you to succeed.

[W]: Right.

[P2]: I think I was surrounded by people who were giving me exposure to other things. So opening my horizons and then I came there and I thought I really had nothing to lose, I mean I really I had nothing to lose. I was studying, I went to go study office management

and technology that is where I was and I was, no I cannot. I am not going to sit here for three years and how to deposit money at FNB, no. Imagine, imagine no, no, no, no, no.

[W]: I still do not know how to do that.

[P2]: But you know what, you know what, I think what the course did, I think up until that point I would not have considered myself a creative person. I mean I would not have, there was no avenue for me to feel that. I never, I cannot draw so I am well "I am not creative," and then I started that course got exposed to other ways of being creative and all of a sudden I am hey. I am creative now. So that is very important please put that somewhere.

[W]: To the point that you eventually became, you got to the point where you taught the subject. So that is… if I were to put this down and summarise it, it is necessary for us to immerse or to expose our students to areas that are potentially uncomfortable for them because they do not potentially realize that that is something that they need.

[P2]: Yes.

[W]: Right. So therefore even though this is a hybrid program and we are spanning the spectrum in terms of the types of skill sets that are required in industry it provides a basis for them to be able to move beyond that when they reach industry. They have a good enough grounding to be able to understand "this is who I am and this is who I am not."

[P2]: Yes.

[W]: Okay. So they can then scaffold from having a core competence in design aspects, in technology aspects, have a…and a reasonable grounding in that to say "look you know what, I am really really passionate about backend, I know enough about frontend such that if I need to call in a frontend person I know what to ask them, I know what to speak to them about, but that is not where I want to develop myself.

[P2]: Yes.

[W]: Okay no that is cool. Obviously there are out of class influences which are difficult for us to control. There are emotional parts to this thing that are difficult for us to control and as a former lecturer I can share that one of my interviews with a student turned quite emotional, a female student, because she has been told by her peers that she cannot design and by male peers, and I realize that that is an aspect that is very influential in learning experience. Being a woman in an IT department is still, there is a gender bias here, which is still prevalent. So that does influence the learning experience and that is possibly the focus of another study, but all of these things contribute to the ultimate experience of feeling "I have accomplished something here." What is very interesting in our conversation, this is why I really want to talk to you is, because of the multifaceted nature of your experience, your life experience, having come from the office technology space, having worked in industry prior to studying and coming, then coming to realize that you know what "hey I can actually do this" and then eventually even teaching in

that. To me you are a success story and it is unfortunate to have your story here included in this study so thank you for that.

[P2]: Thank you for saying that.

[W]: I have selected you guys very carefully.

[P2]: What are you studying? I thought you were doing your engineering thing. So this is not about that?

[W]: No, no I moved beyond that. The focus of my study is towards a whole brain curriculum for multimedia practitioners. I am looking at ways in which we can engage people holistically so that at least they leave with a reasonable competence across the spectrum, but I first needed to understand whether we are doing them a disservice in doing so. Should we be focusing and specializing from the word go, or are we doing it the right way the way we are doing it right now?

[P2]: Can I assume that by your description of your topic that your perspective is that the left and right and whole brain does exist?

[W]: I believe that we cannot function in the world, and this is just a personal opinion okay, there are seasoned neuroscientists out there that would shoot me down for even wanting to venture into this space, but my but my personal opinion is that, we cannot function without the whole brain working together. The corpus callosum is the part that separates the left from the right, and while functional MRIs have shown that there is certain heightened activity in certain parts of the brain, it has now even been devolved down to quadrants it is no more even hemispheres it is quadrants. So to certain quadrants of the brain that are activated when you do certain things, yes they have confirmed that when you are doing certain creative things more spaces in the right side of the brain tend to be activated and that is where this whole left brain right brain, in fact the left brain right brain thing comes from very, very early studies that were done by Sperry and another, one other guy, I forget his name now, where they actually cut the brain in half along the corpus callosum and found that certain functions were attributed to the left part of the brain and to the right part of the brain. I think that there is a large aspect of socialization and boxing that happens at a young age where people have said, are told, our kids have said “do not use your left hand use the right hand or you never going to be an artist you might as well just concentrate on your math” and so forth, but then I have come across many individuals in engineering, my colleague for example, he is an accomplished musician he plays four different instruments, self-taught, he sketches like it is a painting, yet he teaches one of the most difficult engineering subjects, which is communications, out of engineering. I do believe that with the right curiosity and with the right nurturing, we can achieve at least minimum competence to a point where people can get to the point where they say “okay fine I want to excel in this area because that is what really makes me comfortable.” I have been trying to interrogate what is preference, what is comfort, whether there is an “affinity” is the word that you used. Do I grow up being a natural

artist? Perhaps people like that do exist. Perhaps people are just naturally mathematicians, I do not know. The literature is all over the place on that one.

[P2]: Coz it is so difficult to…I mean there probably are. There is probably everything that you are saying. The answer is yes.

[W]: Right.

[P2]: Yes there are people who are born that are just …"they just get it" and they just amazing at it and yes there are people who are born that cannot, not cannot do it, but that are not neutral and can learn to do it. So there is yes to everything.

[W]: Yes because the thing is the human condition is such that we cannot just apply a single rule to everything. My belief is that if we pitch this right we can let students exit with a reasonable competence in all of the areas and I am not aiming at virtuosity now. I am aiming at where students can leave here saying "okay fine I have enough of an understanding of all of this to know that this is where I want to grow," but I also know that those other areas exist and if I wanted to explore that I could. I am also aware that me, as [W], I can learn to kick a soccer ball, but where I exist in terms of the context of where I am right now in my life, I will never be a Messi, I will never be a Ronaldo. I do believe that some people might be born with natural tendencies we have seen that with kids that have just naturally taken to a piano and to be able to play with very little or minimal training, yet others need years of growth to reach that type of expertise, which opens up a whole range of other questions, so yeah this is just…

[P2]: Interesting stuff. You have got people who are trying to put their kids into ballet. I say no, do you know what she wants to do? She wants to run around with her skirt on with her friends and do ballet. It might not be real ballet, I do not care. She does not care either. So …

[W]: Fun.

[P2]: I am going to expose her to different stuff, she will do ballet now, next year or next month she will do something else.

[W]: Yes.

[P2]: She is doing gymnastics. That is cool.

[W]: Yes, absolutely.

[P2]: Like chill out.

[W]: No there is, I believe, you know there are arguments to be made from all fronts here and the thing is, we are evolving as humankind and I do not think we ever going to get the answer right, but it is all about intent. It is coming from the right space if there is play, lots of playing involved because I think we learn better when we are playing. I do believe that we can stimulate areas of the brain we felt that we could not do. Brain plasticity experiments have shown that people that formerly had strokes can recover to

some degree. There is lots of research, cutting edge research in neuroscience that we have not even touched on. [P2] I need to go, I thank you so much.

[P2]: Okay, bye.

Transcription
Student code: S4
Duration: 00:41:30

W: Interviewer
S4: Interviewee

[START 00:00:00]

W: That's my backup. Okay. [Name], could you please state your full name for the purposes here?

S4: [Name]

W: Thanks, and [Name] do you voluntarily agree to this interview?

S4: Yes, I do.

W: And do you consent to me using the information that comes out of this in formal research papers and possible conferences?

S4: Yes.

W: Thank you. So I've sent you the context of what the questions are going to be about,alright? I'm trying to understand how students work, how they learn, what they prefer to do in the learning environment. Are you comfortable with working as a person both in design and technology?

S4: Yes, I am.

W: So you are okay with the work in the coding, as well as you feel comfortable working on the design side of things?

S4: Yes, however at the moment my coding skills have gone a bit down, because I haven't actually harnessed my skills or done tutorials or worked on it because of the internship. But within class I would say, in third year, I do think that we should have done more exercises with regard to web design and web development. Like now I'm doing BTech and I'm having assignments every week, so I'm basically being forced and pushed to work harder to get my stuff done, to read and write more. But when we did third year, it was like you get an assignment and then they give you two or three weeks to work on it. However, people don't use the time effectively. So they wait til the last minute, like two or three days before the time, some even on the day, to get it done. So I even, myself, I didn't use my time effectively. So I do think if we had, like mini exercise, it doesn't always need to cunt for marks but just to get us in the groove to work on it constantly.

W: Okay, great. So, you say you are comfortable working in both spaces, okay, within the context of what we've spoken about there now, in terms of what you've read. So like the integrated project would have aspects that relate to design and then aspects that relate to the technology and the back end and the coding and so on. Do you have a preference for either? You say you are comfortable, but do you have a preference for either design or technology, or are you absolutely okay with both?

S4: At the moment I'm more so for design because of the decrease in my coding skills. However, I want them to be balanced out. I would prefer them to balance out because it's only going to benefit me. Because when you go out into the work environment if you can do both then obviously you are at the more advantaged stage than the person who is only inclined to do one particular thing, you see.

W: Alright. So then in your view, from a career perspective, do you think you should be competent in both?

S4: Yes, I do. But in multimedia, yes you should. If you're only doing design then I would suggest you go and to graphic design. I do think that.

W: Alright. Why do you think you need the skill sets from both in the industry?

S4: We are in the faculty of informatics and design. We are in the IT department, so I do think that we need to be able to do both design and development. Last year the people that did AppDev, they did web design as well, PHP. Why didn't we really get to explore PHP? We only did WordPress, but that could also be because of the time constraint. Okay, and I spoke to Mr [Name] and we spoke about [Angler][00:03:53]. He said he still wanted to teach us Angler as well but we never got to that. So I do think because of the time constraint and because there's so much to cover. I do think that the lecturers should actually invest time in doing some research as to what is happening in the industry or what trends will emerge for instance in 2019 or so, so that you can actually cover that. So for instance, if you go online and you check or jobs, and you'll see a PHP developer required, thenI do think PHP should be included within the curriculum. So next year something else will emerge, then you need to adjust the curriculum as the world is changing. So I think that should happen.

W: Absolutely. Thank you for that. So in terms of the working environment and where you'd like to see yourself, would you like to be a specialist in some particular area or would you like to be a generalist?

S4: I would like to be a specialist when it comes to design. I actually already registered my business, so at the moment I'm just doing some logo designing and branding. I do, however, do WordPress development. It's quicker, it's easier, it's a content management system so the client can actually edit and do the stuff themselves and they don't need to hassle me. Also, it's a lot of work and I'm only one person at the moment. But when it comes to hosting, I do think that hosting should be included in the curriculum to showcase how you can get all that stuff together. Like you do you web design, then you do your web development. Now you need to get it online. So the different ways in which you can get it online. Obviously we only know about FTP, but you must also look at hosting options so that you can make informed decisions - because at the moment some people don't even know what to do or where to go. Because when you tell someone "Oh, I do web design or web development" they're like, "Oh, make me a website". Well, is hosting included? So you need to think of that as well.

W: You're absolutely right. So you've mentioned that you've registered a company, which is great. I think that the career and the environment that you're in lends itself quite nicely to be able to do that. In fact i started many years ago myself doing that. In 2008 I launched my first one and I still have those clients today. And those are things I had to learn as well. So everything you've mentioned around hosting and around hosting options and about bandwidth and about speeds and about backups and file transfers, these are all things that are inherent within that environment that you need to do. So, as you grow thins company, do you want to continue doing all these things yourself? Or do you feel that at some point you would take someone in that is maybe a specialist in, say, coding or back end?

S4: I would.

W: Or do you feel that you'd want to do everything yourself?

S4: I would definitely. I need to expand my business. I'm not thinking of just being in this one spot. I want to expand it, get more client, even expand to different areas and regions, you see, not just here in Cape Town.

W: So, do you still feel you'll be able to do it all yourself?

S4: No, because obviously I'm going to have more clients. And also, the clients don't really understand that if they say "I want a website", so they don't really know what goes into creating a website, a quality website. So like, "Okay, make me a website" then they want it next week. it's not possible to get it next week. So, now you have like three or four clients all wanting a website. How are you going to manage with that? Soif I have someone else, then I can give you two websites to do and I'll do two websites.

W: Okay, now hold on. What I'm trying to understand is, what part of the work will you give to someone else?

S4: Coding.

W: Okay, alright.

S4: It takes more time, yousee, and I can quickly design things.

W: Oh, I see. So it's not that you're not comfortable in it, it's just that you...

S4: No. I would love to, but it takes quite some time. And also, at the moment most people prefer WordPress websites because it's easier to manage. But I want to do custom websites, but that's going to take more time. Because I'm going to hard code it actually, you see? And that...

W: I know.

S4: So it's all about the time constraints.

W: Absolutely. So do you think that, in terms of preparing you for the industry, that there are essential skills that exist, both on the design side and on the coding and the back end side that you are exposed to, but that allow you to specialise later? I don't know if my question is clear. Alright, so in terms of what the industry needs, alright? Your perception of that. Do you think that there are certain skills that you need to have in place, certain course skills that need to be in place?

S4: Yes.

W: When you leave here, on both sides, in order for you to make the decision that "I'm going to specialise in this later down the line"?

S4: In web development we really didn't do any backend stuff. So when I got exposed to the internship, it was required to do back end stuff which we weren't able to do. so there was only one person that could do that and then we all just shifted to the front end part, because that's the only thing that we could do. So we did HTML, CSS and some Javascript and that was it. We didn't do PHP, we didn't know how to do that. So I do think in the curriculum when they do web development, that they should include some front end and some back end so that you can see what works

for you. Because some people are obviously more inclined to work in the back end and some more in the front end.

W: That's what I'm trying to interrogate, some people are inclined, okay.

S4: It's all about the person. People that are more inclined to work on the back end tend to go to application development. But then they're teaching you how to do websites, to code in HTML and CSS. That's front end stuff, so why aren't the multimedia people doing that, you see?

W: Okay, so let's just...

S4: So are we only going to do front end stuff in multimedia and just leave the back end stuff for application development, or should you combine it? But then also, how are you going to fit all of that into the curriculum?

W: Okay, I'm just making some notes here because this is important information in terms of our curriculum and I'll speak about that after the interview because I want to sort of keep this focused right now, but I think it's important that we have that discussion, because it's so important for the way we go forward. Okay, so I think you've alluded to this already. The question is "Do you think that the core and the basic competencies that you need in design and technology are well supported?", but I think you've sort of answered that already. You have essentially said, and let me see if I capture this properly, that on the design side you feel that that's being done well enough, but on the technology side and the coding side you feel that there needs to be more support there.

S4: It's because in multimedia, design is very theory based. So you take that and then you have to apply it in multimedia practice and in multimedia technology. However, we're doing design stuff within multimedia design and multimedia practice but not so much in multimedia technology. So when we work in multimedia technology, you see javascript and you see numbers and variables and stuff and not everyone is actually paying attention. Like I said, when we had class with Mr [Name]

not a lot of people were even interested in that. They were just there for the design part, like "Uh, this is boring".

W: What percentage in your estimation would you say, of the class, are really interested in technology?

S4: It was basically just me and [Name] and [Name] that were interested in [Name]'s class. The rest, some of them didn't even pitch up, and if they did they came like an hour late.

W: I need to ask you a question that might appear to be sensitive, but I'm trying to understand whether the way something is taught... Let me put it this way. If you are really interested in something, okay, does it matter how it is taught?

S4: It depends on the person. So if you are really determined then you're not going to be bothered by whoever is teaching that, because you're not going to just look at the person that's teaching you or mentoring you. You're going to do your own research and do some work on your own. Like I said, it's about self studying as well. Not a lot of people wanted to do BTech because you need to do some self study as well. So, Nyx is there supervising us, telling us "This should be done, that should be done. Okay, now do it. If you need help, I'm here". But, it's like they want to be spoon fed. So in [Name]'s class, it's all fun and in [Name]'s class you work in the studio and they like that. But when it comes to Mr [Name]' class, now you actually have to think critically and logically, then it's like, "I can't do this".

W: Alright, I'm going to come back to that - those words "critically and logically". I'm also going to come back to "inclined to", okay, because I think those are important things for us to unpack. I hope I'm not taking too much of your time here...

S4: No, of course now.

W: ...but I think this is a very important conversation - especially with someone as bright as you. So I think I've actually asked you this already and you've answered it.

The question is: "Do you think there is a noticeable preference for either design or development in your programme?"

S4: Design.

W: Design, okay.

S4: It's like, [Name] and [Name], they're kind of like a friends but they're not really your friend. So people speak to them as if they are friends, they communicate like that. And [Name] will give you advice and all of that. Mr [Name] is there and he's this older guy, you see, so he can't really relate to the younger people. So when you're in [Name]'s class, then we'll have these terms that young people use, so now they listen or they talk nonsense. But in Mr [Name]' class, he's very to the point, "Okay guys we're going to do this". But at times he's busy doing something, but there wasn't, how can I say... He's busy doing it but then it doesn't work out so tomorrow we have to try again because of unforeseen circumstances, or maybe because the internet is not working. And then it's like they get frustrated like it's his fault. It's not his fault the internet is down, so. And also, some people don't comprehend something the first time, so now he needs to explain it again. So some of the stuff becomes boring for me if I understand it, so now I have to sit in this class for three hours, listening to this thing being explained because someone else couldn't comprehend it the first time. But he's very considerate to the whole class, to everyone, so he's going to go through it again and again, you see? But they just don't want to get it. They don't want to get it and that's not his fault. Maybe they're just not interested. Because they talk in class, they watch YouTube videos while he's busy teaching.

W: Ja, you see that's really what I'm trying to understand here. Why are they doing that?

S4: But the thing is, we're not in high school. So he shouldn't have to shout and say "Listen here, pay attention to me" or "be quiet".

W: Yes, you're absolutely right. I mean, you performed well in the subject.

S4: [Name] shouted at some of them if they don't listen, and she would tell them "Switch off your monitors and pay attention". Mr [Name] doesn't do that.

W: Well it's different strokes for different folks.

S4: Exactly, but he doesn't need to do that.

W: We can't all be the same as you just alluded to here now. I think, and that is the thing i'm really trying to understand here now. Is it because they find it more enjoyable and more fun in the other subjects and therefore it's the way it's being taught, or? You performed well in the subject, so why can't everybody do what you did?

S4: They're not interested. They just want to do one thing.

W: So it's their choice? Okay. So would you say that motivation plays a large part?

S4: It does. Some people are self motivated. Others need something, a catalyst, someone or something to motivate them, you see. Some people can perform at their optimal but they just don't want to. or they need to have a talk with someone, or someone will say "No, you need to do this" or they need a helping hand. But I consider myself self motivated. Everyone else is obviously not like me - and like I said, when I came here in first year I wanted a degree. I didn't come here for a diploma, so now I'm here getting my degree. And then the first day that I sat in the class, I was like "Wow, this is it. I wanted this",but I'm sitting there feeling hopeless.

W: Why feeling hopeless?

S4: Because I was like "Yoh, I need to do all of this stuff. I don't understand this" and all of that.

W: A bit overwhelming.

S4: Yes, and then I'm seeing everyone else is so chill. How can you be so chilled? I'm freaking out and then everyone's like "Oh, you don't need to worry, you got distinctions". So?

W: Ja, I think I understand what you're saying. Okay, so when you're doing your integrated projects, so you're obviously working in a group, do you feel that you are forced to work in a particular niche area? Or do you get choices in which you can work in those areas?

S4: Majority, like I said, people in my class are inclined to do the design part. So I was fortunate enough in the previous years to have one of my peers named Joshua, who loves doing videos. So I knew that someone needs to do branding, someone needs to do a website and someone needs to do a video. So he would always go for the video part and I would always go for the web designing part, and someone else, whoever the odd one out is, needs to the branding. So in second year, there were three people assigned to do branding and I was the only one to do the website and he was the only one that did the video. The same last year, last year we were only three so I did the website, he did the video and then the other girl did the branding. But I ended up doing some of the branding as well.

W: Okay. Do the group projects work as they are, or do you have suggestions for doing something differently there? I sense that people work in the areas that they are comfortable in, okay. Does that necessarily lead to the best learning experience? Do you think that if we're forced, and I say this carefully, but we manipulated the situation in a way that everyone must round robin through the different roles, do you think that would be a different learning experience?

S4: I do think so, because for me it's like, the reason that I worked with Joshua is because he's more technically inclined, working with equipment, videos and that type of thing. I'm not so experienced with that, so I'm going to pair myself up with someone who is not similar to me. Because if I'm working with [name], we kind of think alike and he's also doing web design and web development. What am I going to learn from him? I need to explore something else. When we used to go to the studio I was never comfortable because I don't actually like photography. I don't like

to get my pictures taken or actually going out. If I'm going to do it, I want to do landscape. Now I've got to take pictures of people. Not my vibe. And we had an assignment where you had to pair up, and I freaked out. I was like "Oh my word, what am I going to do? I have to take pictures of someone". So I paired myself up with [name], who I knew was an expert within that field, you see. And then we both ended up getting distinctions for that subject, for that particular assignment.

W: Where's [name] now?

S4: Well he finished his internship in November because he did a three month one. I can't remember the name of the place, but it's her ein Woodstock somewhere. He's out living his best life - out going to the wolf parks and stuff like that.

W: That's fine. You'll have your BTech soon, so you'll also be going to the wolf park and then...

S4: And I was sitting in class and I was thinking to myself "Where is my partner?". But he wouldn't survive in that class, because reading and writing, he wouldn't.

W: This is preparing you for research,if you want to go that route.

S4: Yes.

W: And also having something called a Bachelor's Degree sounds a lot better than a diploma.

S4: But also I like the fact that we're having this BTech and that we have to actually be able to think about what we need to do and be conscious of our decisions. So, in [Name]'s assignments, some people didn't do so well on the report writing, because on the report writing you basically had to explain your choices of what you did, why you did it, your audience. They didn't really do well in that, because like, I don't know.

W: You're right. You see, that's the difference between a short course in how to do something and a university course. And that's the difference between technical

training colleges, what they used to be, and what we do here. Because at university you must be interrogating things. You must be asking why. You must be able to explain your reasons why. Why did i choose this colour? You know. This is why you get asked those things. I used to teach a lot of these subjects myself. We started the programme in 2001. The subjects were different then, so I used to teach multimedia applications, which was like a whole lot of the software that was required. So in that year, that first year, I'll never forget I taught eight packages. I was going insane. And then in second year I taught PHP and some other things. And third year I did entrepreneurship. I've taught on about five different versions of Photoshop. Things change too fast. I'm not even sure I can do half the things in Photoshop anymore. Okay, here's something that I would love to hear your answer on. Do you think that people... Let's take you, for example. Where did you go to school? Which school did you go to?

S4: Kuils River Technical High.

W: So, it's a technical school?

S4: Yes, but like engineering...

W: Oh, you did engineering...

S4: Civil technology, mechanical technology, electrical technology...

W: Yes, that's interesting.

S4: There was like graphic design stuff, I can't remember what it's called. So all the people that could draw back then shifted to that class.

W: I also went to a technical school. I went to Spes Bona, and we did woodwork and we did metal work and we did electrical work, and I eventually ended up studying electrical engineering. That's why I went there. So it's interesting that because someone that I interviewed yesterday was also at a technical school. I think it's Keanu, ja. Was it? Ja.

S4: I think so.

W: Anyway. Because I was trying to understand why you went to that school and why you chose the subject that you've done here. Do you think that people are born with being predisposed to either design or to technology of coding? Because you mentioned people not being inclined earlier on in the conversation. Do you think people are born that way or are they grown that way?

S4: That is an interesting question. Well, I think it's a bit of both in some cases. Like in my case, I wanted to do a lot of other things,other than what I'm doing now. I wanted to do psychology at one point. I wanted to do education at one point. I wanted to do forensic science - that was my main thing, I was going to do forensic science. I set my mind on that on a very young age. However, my subject choices didn't allow me to do that. Because I took physics and maths, however, I didn't have biology, and then I was like "What am I going to do now?". So that just went out of the door.

W: Why did you go to the technical school?

S4: We have a normal academics school, [Surecta][00:27:18] High. I went to [Surrecta] primary, so all of us basically have to shift to [Surecta] High, so automatically if you pass grade 8 then you just go to...

W: It's the feeder school into that, you know.

S4: Ja, because they're in contact. So all of my stuff went to [Surecta] High and I told my mother i refused to go to [Surecta] High because I didn't want to be exposed to the same people that was exposed to in primary school and I wanted something different for myself. I didn't want the same friends, I wanted something new. And then I was probably going to be a chartered accountant or something because they had accounting and stuff like that, so I was probably going to take one of those subjects.

W: So then when you came here, what made you choose this particular stream?

S4: Applied originally for Communication Networks, not knowing exactly what it entailed. However, I have something in IT and read up about it and I was like "Okay, I'm going to do this". Then first year came, we did AppDev. AppDev was alright. Like the theory stuff, I understood some of it and then I realised like the practical things, long term wise, at some point I'm going to struggle with this. I already knew that - sometimes I get it right and other times I don't, but I wasn't very sure about that. That just shifted to my third choice for second year. Then I was in [Name]'s class and we did videos and stuff, and I was like "I'm definitely going to do Multimedia, I'm going to do video production" and all of that. I didn't, it changed again. So constantly, it changes for me. I wanted to do Law Enforcement as well. Ja. I even considered going to the army.

W: Oh my word, I think I would have been quite afraid of being on the opposite end of you in such a situation.

S4: I wanted to do testing of weaponry or something like that, I don't know.

W: Very interesting choices.

S4: Wild. Wide, same thing.

W: It's quite wide. But that's interesting that you mention that, because you've got a vast amount of interests. And would you say that that vast amount of interests is as a result of you being able to work in those different creative spaces as well as well as the possible logical space at the same time?

S4: I do think so. I've always loved DIY things, so I always like to do something with my hands. Whenever there's something that we need to do, a project or whatever, I want to make something. I never want to buy something, I want to do it myself because it's fun. But then when it comes to the technical side, then I just shifted towards that as well. So I'm a bit of both. Like, even now I'm not entirely sure which

one I really am. Sometimes I'm more inclined to do design stuff and other times I'm more technically inclined.

W: Okay, so let's go back to the question - but I think you've answered it already. So the question was around whether people are born with a predisposition to...

S4: But the thing is, it's what they are being exposed to. So I have friends that, from a young age, used to draw a lot. So now they're all doing graphic design or architectural design, something to do with design. And then there are other that have been playing on their computers from a young age and they are busy doing software development. So it's all about what you've been exposed to as well

W: So there's a nurturing aspect to all of this as well?

S4: Yes.

W: Okay.

S4: I thought I was going to do civil technology, civil engineering. Look at me now.

W: So you've mentioned that you started this business. Now, in terms of the working environment, do you believe that as a multimedia professional, and it seems like this is an obvious answer but we just think about it for a moment... I find many times, and this is my personal opinions of course, that a lot of coders like to work on their own. Do you think though as multimedia professionals, you need to able to work individually or in a team or both?

S4: Both are important. You need to be able to function on your own as well as in the group, because it's like, you can do something on your own but now you're less inclined to work in a group. I was one of those people. I didn't like group work, I just want to do things on my own. Also because I'm kinda proud, I don't want to have "Oh I did that work but now they're also getting credit", so it's because of that. And then in second year, the entire year we needed to do group work and I kind of had to adjust. And then also you have to be careful when you pick a partner. In first year I learned

the hard lesson that friends don't always work well together. And also about time [inaudible][00:32:19] and wherever you are, in whatever situation or environment you are, you're always going to get someone that's not going to want to do the work, and that's okay. So, that's why I learned how to do the participation sheet and say that you didn't do anything and I did all the work. But now we're in a work environment and you need to be able to communicate with people, you need to be able to articulate your ideas, what you're thinking, what works and what doesn't work so that the group can function as a whole. And also, obviously in the group there's going to be someone that's going to be more inclined to be the leader, and there's just other people that just want to follow. Because, there are people that want to be told what to do. I don't like to be told what to do, I like to do my own thing. So whenever I'm in a group, thenI kind of manipulate my way to be the leader.

W: Interesting. Okay, so perhaps we've already dealt with this in some way. Do you think that having a balance across the skills and the competencies in all of those subjects that lead to design, that lead to technology, having a balance is more important than having a strength in the individual things?

S4: It depends on the person. I would prefer a balance because if I want to shift from one industry to another, or from one company to another, if I feel like "Okay, this project I'm more inclined to do the back end stuff or technological stuff" then I want to do that. For a next project maybe the design, but I thinka balance is good. In other cases, like I said, if you want to be skilled in one particular thing, like just design or just development, then you should pursue that.

W: Thank you.

S4: They always ask the question "What is the difference between a multimedia designer and a graphic designer? Why didn't you just go and study graphic design if you're just interested in design?", you see.

W: Good point.

S4: This course is supposed to be both design and development.

W: When you visit a site, now obviously your design lecturers would have asked you to...

S4: Evaluate a site.

W: Evaluate a site, analyse it, look into it. When you come on a site for the first time, what is it that grabs you? What is it that you're inclined to be more interested in -the way it's laid out, the colours, thefonts, the typography, where the logo sits and so on?

S4: The usability.

W: And the usability? Or, are you also interested in what's making this animation work?

S4: Both.

W: Okay.

S4: Usability is important because even if your site looks so beautiful, if something is difficult to find then you're less inclined to use it. You're just going to go to the next site. But also, if I see something cool on a website, I'm like "Oh, I wonder how they did this", so I'm going to go and check the source code and see if I can do it myself.

W: Brilliant, ja no I wish we could have a lot more like that. Okay, what do you think in your years as a multimedia student and and now [inaudible][00:35:57] line BTech, what were the most important aspects of the programme for you, or aspect, or thing that really made the difference?

S4: I think project management is very important, and I would say a lot of people never attended that class. Being able to manage your work effectively, planning, I think it's very important, that key aspect because even if you go out into the work environment you're going to need to have that. And professional communication. All the boring subjects is kind of what we needed, you see. So now, even though

multimedia design in practice was so much fun, now I'm at Btech and I'm thinking "Wow, I need to go back to professional communications 2 and 1 to check my notes on that".

W: Ja, great.

S4: And time management.

W: Ja. So you've heard the concept of left brain, right brain an all brain?

S4: Yes.

W: Okay. Do you believe that that exists, that people are inclined to be more right brained and more left brained?

S4: It's all about what is being harnessed. So if you're only going to feed one thing, then only that one thing will grow, you see, beut if you're trying to feed both sides then maybe both will grow. It's like a plant, if you water both then it will grow.

W: Do you believe that you're a whole brain person?

S4: I would love to believe that. Honestly, I do hope to fully achieve that one day. I do.

W: So yu believe that you can work towards that and that is something that you can merger?

S4: Yes, it's all about myself. It's all the person, individual. You need to feed your passions.

W: That's an important word. So then the passion is what's driving all of this and even though you may not have enjoyed the photography art, you knew that it was an essential part of you needing to get to where you needed to go to.

S4: Yes, the photography part did help me because we also spoke about how you need to engage with people, you see. And even though I thought I could engage with someone, to get certain emotions...And also manipulating things, that was also part of the photography, you see.

W: Alright. You know about Leonardo Da Vinci. You know about all his achievements, much has been written about him, there's even a tv series about him. He was able to function in so many different areas, exceptionally well - his paintings, his sculpting, his engineering drawings that was way ahead of time in terms of the thinking. Some of the drawings were the precursors to the helicopters that we know today. People that can function that highly in all those different areas, do you think that they are just born, or can they be grown?

S4: I do think they can be grown. Like I said, it's about what you feed. So if you are being exposed to one particular thing, then I do think that that will grow. It's the same with what you're being exposed to media wise. So if a child sees something violent on television constantly and that's the only thing that they know, then obviously they're going to be more prone to do that.

W: Okay, thank you. And lastly, is there anything else that you'd like to comment on, contribute or go back to that you feel we haven't unpacked quite enough or that we need to know about that we haven't covered?

S4: I just think that the exercises need to be done. They shouldn't be allowed to get so much time to work on an assignment, because they don't use it effectively. I can speak for myself and for other people that I've been with in groups, and I'm like "How far have you gone with your assignment?" "Uh, no I haven't started", that's usually what they say. So that time, it's like you're setting mini timelines. So if you have a big project then it needs to be broken up. So it's like you're working towards it and you're just building upon it. There isn't going to be one major deadline, it's may deadlines, so then they're more prone to work. So if you have a big project, okay first thing, you need to plan ahead what you're going to use. You need to know what assets you will need to collect, so write something up about that, or show me your resources for that particular thing. Do a mind map, or a wireframe for that, you see?

W: Someone mentioned, one of your classmates when I asked them the question around whole brain, they said that "[Name] is probably the closest person to a whole brain person that I know". So, I think people do view you that way, which is great I think, because you've mentioned that that is what you're aiming towards, that is what you're trying to grow within yourself, which is great. Thank you, [Name]. I think we've covered everything that we needed to talk about. Let me just see. We have, yes. Okay, I can stop.

[END 00:41:30]