

**A study of the composition and effect of educational program streams of students within  
NAIT's Department of Media Innovation and Communication Technologies**

An Applied Research Paper (ARP) submitted to Cape Breton University in partial fulfillment of  
the requirements for the degree of Master of Business Administration in Community Economic  
Development

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January 6, 2025

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## ACKNOWLEDGEMENTS

I must thank the following people for their guidance, input, and direction in the development of this research, as they have been integral to the process:

George Karaphillis is the former Dean of CBU's Shannon School of Business. As my first point of contact with Cape Breton University and this MBA program, you have been supportive when I needed it most. Thank you for this opportunity. Laura Syms, Data Services Liaison, Cape Breton University. Thanks for your support, cheerfulness, and all those weekend and after-hours emails. You have provided invaluable advice and direction.

Special thanks to Dr. Olle Lagerquist. Without your support, the NAIT Centre for Innovative Media and the foundations of enquiry for this paper would not exist. Thanks for your ongoing guidance, wisdom, and warrior spirit.

Dr. Melissa Dobson, in your role as an instructor at NAIT and mentor for many Cape Breton MBA ARP students. Many thanks for your input and guidance in developing the research question and supporting this final MBA deliverable without so much the pointy shoes.

Dr. Alexander Ondrus, Dr. Tony Olmsted, and Marwan Amaneddine from NAIT. Without your guidance, the proposed research's data sourcing, analysis, and presentation this work would have been more challenging.

Thanks, Dad. The final edits of this paper were completed in the hallways and classrooms where you worked to complete your BSc. over the years.

To my Mom, your gentle reminders of the importance of completing this paper have helped me reach the finish line.

To my brother Dean, the strong, silent one, thank you for your determination. Each visit with you renews my sense of the importance of family and the community in which we exist.

Most importantly, my loving wife, Denise Muri, editor, counsellor, and cheerleader. Thank you for all your support along this journey; the finish line is just around the corner and over the next hill.

Further, the Institutions from which this study has been forged. U of C. SAIT, NAIT and now CBU MBA Alumnus in 2025. Invictus!

Wade G. Muri

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## **CHAPTER ONE – INTRODUCTION AND OVERVIEW**

This document contains a study of the composition and effect of educational program streams of students within NAIT's Department of Media Innovation and Communication Technologies. NAIT is a publicly funded Alberta-based post-secondary polytechnic institution in Edmonton, Alberta, Canada.

The primary objective of this study was to provide an analysis of student data within different educational program streams and assess how these academic programs effect student employment and income over five years. An analysis of two distinct yet related data sets was completed to achieve the primary objective. NAIT's Office of the Registrar provided the first data set, and NAIT's Office of Institutional Research provided the second. The data sets spanned five years of historical student information. These data sets represented students within the Fall 2012 to Spring 2017 academic years (Registrar's Office) and the student survey data within the same period (Institutional Research). As part of this primary objective, the researcher included findings related to inequities regarding employment opportunity, gender and age relative to findings within the literature review.

A secondary objective of this study was to provide a foundational framework for understanding the global Creative Industries landscape and the Interactive Digital Media (IDM) Industries within a Canadian context. Understanding the composition of the Creative Industries compared and contrasted with the Interactive Digital Media Industries was necessary to develop an understanding of the taxonomy supporting the analysis contained within this study and assist future research in building from the work addressing the primary objective of this study. It is important to note that the primary objective is associated with a need to understand why



differences may exist across different disciplines within the IDM Industries; as such, this secondary objective was introduced as an integral component of this document.

Within this secondary objective, this study has set a foundation for further research, including investigating gender and age imbalances and associated earnings potential in creative, technical, and business fields.

As governmental programs have been deployed to support growth within the Creative and IDM Industries (Bae & Yoo, 2015; Cunningham & McCutcheon, 2021; O'Connor, 2010, 2013; Thompson & Campbell, 2022), this objective is an important component within a Community Economic Development framework to help inform stakeholders as they are not always equitable for individuals working within these economic areas (Abbasi et al., 2017; Hartley et al., 2017; Oakley, 2004).

### Relevance of Study

In 2017, the Government of Alberta passed the Growth and Diversification Act (*Bill 2: Alberta Growth and Diversification Act*, 2018), introducing a new policy scheme through tax credits to support the IDM Industry. This same Provincial government also provided increased funding for 100 new students (for the academic year 2019/2020) within the Department analyzed in this study (Rieger, 2018).

Of note, these two instruments to support the IDM Industry were executed under the leadership of the New Democrats (NDP). These supports were not renewed in 2019 when the United Conservative Party (UCP) were elected, a topic that appears to be the subject of ongoing debate among industry representatives, media outlets, and Government officials (Aldrich, 2023; Simmons, 2022).

More recently, in 2023, the Liberal Government announced a federal support program for Creative Industries companies interested in exporting goods and services (Canadian Heritage, 2023). Within the literature outlining support for this sector, the documentation continues to utilize the IDM Industry branding within the greater context of its policy literature within the Creative Industries.

It is important to define the specific areas of a region's economy as part of the support that a government body may provide. This study establishes a foundational understanding and framework of the parts of the IDM Industry. The analysis of Institutional Research data provides the reader with an understanding of the segmentation of the different academic areas based on the findings addressing the Secondary Objective. Further, it highlights some challenges and opportunities facing students graduating from these programs in a socio-economic context, as well as the utilization of tax dollars to support a segment of a region's economy that may have associated inequity for individuals employed within it.

### Definitions

The following definitions have been provided regarding the nature, origin, and regions of use of the *Creative Industries* and *Interactive Digital Media (IDM) Industry*. To understand this, we must first start with the birthplace of what is known as the Creative Industries.

#### Cultural Industry or Cultural Industries

The terms *Cultural Industries* or *Cultural Industry* in this study can be considered interchangeable. The researcher has favoured this approach for clarity within this paper, as both terms can be found in historical research papers spanning several decades (Hartley et al., 2012, p. 77-78).

Cultural Industries *can* loosely be described as economic agents within a region as defined by local policies and programs that support the subsidization and commercialization of cultural elements within it (Chapain & Sagot-Duvauroux, 2020; Hartley et al., 2012, 2017; O'Connor, 2010).

As Cultural Industries are often defined in a national context (Monclús & Arfaoui, 2017) and measured via high-level national metrics that differ from country to country (Jeffcutt et al., 2000; O'Connor, 2010), a specific municipal-level definition is not offered as it is outside the scope of this study.

It is important to note, however, that cultural Industry policies are considered to be in part responsible for the birth of the Creative Industries (Hartley et al., 2017; O'Connor, 2010), and as such, they provide a valuable reference in the development of this relatively new and growing set of industries (Abbasi et al., 2017; Hartley et al., 2017; Jones et al., 2016).

Further discourse on the history and composition of the Cultural Industries exists in Chapter 2.

It is also vital for the reader to note that both Cultural and Creative Industries are highly fluid, consisting of multiple overlapping commercial agents within a region, often defined in regional policies and associated funding programs or other support instruments. Cultural and Creative industries are not easily defined, as specific activities or economic segmentations can bleed into many adjacent segments within a regional context (Hartley et al., 2012).

For a reader new to Creative Industries, the commercialization of art and creative activities may be all that is initially considered. Those new to this area must expand their thinking and include technological elements as integral components of this domain, which is another reason for the taxonomy developed as part of the secondary objective of this study.

Based on the expanded discourse surrounding a taxonomy for the Creative Industries within Chapter 2, the researcher posits that those working within Creative Industries *must* be working to provide products and services within the intersection of creative, business, and Information and Communications Technologies (ICT), as historical research has suggested. (Abbasi et al., 2017; Bakhshi et al., 2015; Comunian et al., 2015)

Creative Industries can and should be partially defined in terms of local policies and programs that support the subsidization and commercialization of content and technology found within it; however, Creative Industries are considered more market-focused than Cultural Industries and cannot be attached to regional policies and programs alone (Comunian, Chapain, et al., 2010; Monclús & Arfaoui, 2017; Peck, 2005).

Like Cultural Industries, Creative Industries are challenging to define, considering how rapidly ICT technology advancements support their development and expansion.

Further discourse on the history and composition of the Cultural and Creative Industries exists in Chapter 2.

#### Interactive Digital Media Industry – A Canadian Context

In February 2009, Nordicity, in partnership with other federal and provincial organizations, including the Canadian Interactive Alliance, published the "*Canadian Interactive Industry Profile* (CIAIC, 2008). This study introduced the concept of the *Interactive Digital Media Industry* (IDM Industry) within a Canadian context. It provided a national overview of elements of the IDM Industry as defined by companies working within the following environments:

Digital content and environments with which users can actively participate or which facilitates collaborative participation among multiple users for the purposes of

entertainment, information or education, and is commonly delivered via the Internet, mobile networks, gaming consoles or media storage devices. The two essential sub-sectors of the interactive digital media industry include the entities creating the end-user experience (creators) and those designing the applications allowing for the creation or distribution of the content and environments to the user (enablers). (CIAIC, 2008, p. 21)

The work contained within this study will further posit that a model for what comprises the global Creative Industries is highly similar, if not the same, as the framework offered for the IDM Industry in a Canadian Context. The IDM Industry, as an '*industry*,' is a term recognized by federal and provincial entities within Canada. While the more widely accepted name Creative Industries is used throughout this document, it can be considered substantially similar to or the same as the IDM Industry within a Canadian context for this study.

#### Importance of the Creative Industries within Community Economic Development

Cape Breton University's Master's in Business Administration (MBA) in Community Economic Development challenges students to consider what is *community*, what is *economic*, and what is *development*. It also challenges the student to discover *who* is doing the development and to *whom it benefits*.

Community economic development, in an academic context, could broadly be described as a field of study that includes research on disparities and inequalities relating to race, gender, age, education, economic value, and geographic or place-based analysis.

More importantly, in terms of potential solutions to gender, age, education, and salary issues within these disciplines, Creative Industries can be considered a technology-fueled incubator for innovation, not just in terms of the products and services they deliver to the market but also in terms of new business processes and organizational structures. Lempel and Germain

(2016) elaborate upon this within their research on *Creative Industries as hubs of new organizational and business practices* with the following:

One can look at creative industries as pioneers of managerial and organizational practices. One can also look at creative industries as areas of business that are not necessarily the first to introduce managerial innovations but are responsible for further development and diffusion of innovations that first arise elsewhere. Finally, one can look at creative industries as industries that play a central role in shaping the future of management, much as manufacturing industries shaped managerial mind sets in the 19<sup>th</sup> century, and science-based industries in the 20<sup>th</sup> century.... creative industries are of considerable interest in part because they embody many of the characteristics of post-industrial economy: flexible organizing, advanced use of technologies in the production process, innovation that relies on questioning of established logics, and extensive employment of creative and technical talent. (Lampel & Germain, 2016, p. 2327, 2332)

While first impressions of the *Creative Industries*, there is more to this sector than *creativity*. As will be demonstrated in Chapter 2, *technology and business* also play critical roles.

Additionally, researchers have found that economic growth is influenced by government programs, patterns of sectoral specialization, and creative firms' growth rates within the greater context of the Creative Industries (Piergiovanni et al., 2012).

Government programs supporting the Creative Industries can be problematic in terms of harmonizing the use of public tax dollars to support this sector when contrasted with inequities that may be present within the different disciplines and the individuals employed within them.

This is discussed further in Chapter 5 of this study.

### Taxonomy for Research Analysis

As the reader may take the term Creative Industries as a domain of practice specific to those working in a creative capacity, a taxonomy for analysis was required and developed based on existing peer-reviewed research journals and industry publications to expand this understanding. The taxonomy developed in Chapter 2 provides a mechanism to describe the industry, but more importantly, for this study to identify and classify students within creative, technical, or business programs. This approach required analysis of the Cultural and Creative Industries and, ultimately, a place-based model for the Interactive Digital Media Industry in a Canadian regional context within NAIT. This taxonomy is developed and explained within Chapter 2 of this study.

Based on the relative newness of the Creative Industries (Hartley et al., 2012; Jones et al., 2016; O'Connor, 2010) and the evolving disciplines and opportunities considered to exist within it (Abbasi et al., 2017; Comunian et al., 2015), this model is being offered as a conceptual framework for use in the analysis section of this study in Chapter 4 as developed from the literature review and taxonomy development discourse in Chapter 2.

### Study Audience and Intent of Study

The suggested stakeholder audience for this study is quite extensive and would include but not be limited to:

- Academic leaders at NAIT;
- Academic managers and practitioners, both at NAIT and in surrounding post-secondary communities;
- Industry associations such as Digital Alberta and the Alberta Media Producers Industry Association
- Other potential stakeholders within the Interactive Digital Media Industry, as well as;
- Researchers interested in this subject matter area.

Potential long-term impacts of this research may include:

- A better understanding of the complexion and outputs of a single set of academic programs within an Alberta-based polytechnic;
- A better understanding of macro-elements within the global Creative and IDM Industry;
- Changes or enhancements to educational programs, graduate student statistics gathering and reporting;
- Changes in support for the IDM Industry by way of research funding or policy and program changes;
- Follow-up research relating to the subject matter within this study.

### Program Information

Analysis of five years (2012 – 2017) of student data from 13 diploma-level program streams within the Department of Media Innovation and Communications Technology (NAIT, 2019) informed this study. During this period, program streams were:

- IT System Administration
- IT Business Analysis
- Software and Application Development
- Web Design and Development
- Game Programming
- Game Design
- Animation
- Digital Cinema
- Visual Communications
- Radio
- Television
- Graphic Communication
- Photographic Technology

### Scope and Limitations of the Study

The Institutional Research data represents five years of student data collected under a survey instrument, as provided voluntarily by former students (graduates) within the same programs. (See Appendix A.6 for the Survey Template). As such, the data provided by Institutional Research cannot be verified as accurate.

The researcher identifies these two data sets as related but not representative of the same student population. The Registrar's Office and Institutional Research data are assured to overlap in student populations but will not be representative of the same students. For example, a student



record within the Registrar's Office in an academic program in 2012/13 may directly relate to a student record in a 2015 Institutional Research Survey if the same student was in the program over this timeline. As these data sets are anonymized, there exists no instrument for the researcher to identify a direct correlation between individual student records within the two data sets.

Additional research would need to be done to address further longitudinal similarities or differences across different timelines, institutions, or regions.

The secondary objective of this study is to provide a foundational framework and taxonomy for understanding the global Cultural and Creative Industries, as well as the Interactive Digital Media (IDM) Industry within a Canadian context. To this end, the researcher would posit that the secondary objective has been achieved by providing a framework for analyzing the student data as a component of the primary objective. It is important to note that this foundational framework is not meant to provide a rigid, universally transportable understanding of the Creative Industries or IDM Industry, as this understanding needs to be developed in a location or place-based manner, which will be discussed further in Chapter 2.

### [Outline of Remainder of Document](#)

In Chapter 2, the researcher provides a brief macro-level history of cultural industries and the evolution of a segment of this domain into what is now known as Creative Industries in a global framework. The researcher then introduces the Interactive Digital Media (IDM) Industry in a Canadian context, discussing the industry's challenges and associated definitions. This approach provided an understanding of the taxonomy developed for use within Chapter 3.

It is important to note that the macro-level literature review and discussion within Chapter 2 were completed to provide the reader with an understanding of how it informed the

methodology and research design outlined in Chapter 3. Without this understanding, an analysis of the micro-level student data described in Chapter 4 would not be possible.

Chapter 4 includes a discussion and analysis of the student data as a response to the research question and sub-questions.

Chapter 5 contains the final comments and conclusions for future debate and research relating to students and the 'Industries' in which they will apply their skills.

## CHAPTER TWO – LITERATURE REVIEW

Sixty-three peer-reviewed journal articles, six government policy publications, seven industry publications, two academic texts and a measure of media articles were reviewed to obtain a broad global perspective of communities of practice that could be of general or specific interest within this study. The volume of documentation reviewed was to provide a historical context of the Cultural and Creative Industries in a global and regional context and to help introduce the Interactive Digital Media Industry in a local Canadian context, as well as to outline common issues in terms of gender, age, and opportunities within these economic areas.

Following the ethos within the Introduction to "*Key Concepts in Creative Industries*" (Hartley et al., 2017), the content contained within this Chapter relating to Creative Industries is provided as more of a history of ideas and concepts rather than delivering a rigid set of definitions. Reviewing this publication is an invaluable exercise in understanding the amalgam of disciplines that contribute to the creative industries and their ongoing evolutions, be it the arts, technology, and social sciences disciplines or through cultural, economic, political, technological, or scientific lenses.

This approach also favours a more dialogue-centric approach to understanding as it provides us with context relating to attempting to develop boundaries for the Creative Industries:

It is unreal to expect that at this stage we can fix some ideal, synthesizing set of definitions upon which we can agree. What is more important is to understand the variant usages and the way that they reflect the different interests and values of the particular groups involved. (Jeffcutt et al., 2000, p. 139-140)

Within the more recent analysis of the Creative Industries (Abbasi et al., 2017; Andres & Round, 2015; de Klerk, 2015), various disciplines within each study are compiled as part of the

taxonomy that helps define this space. While not exhaustive, these studies list different disciplines from within local environments, with measures attached to the Creative Industries that focus on economic value as a measurable quantity. Other research offers critical warnings of the limitations and consequences of this approach (Lee, 2017; Oakley, 2004).

This understanding of the Creative Industries in the broadest sense will then transition to the regional Canadian context of this landscape (Thompson & Campbell, 2022) and, following this, the notion of the Interactive Digital Media Industry (Nordicity, 2013).

### Historical Context on the Culture Industry

The first mention of *Culture Industry* appeared in Theodor Adorno and Max Horkheimer's 1947 publication, *Dialectic of Enlightenment* (Hartley et al., 2017; Jeffcutt et al., 2000; Moore, 2014; O'Connor, 2010, 2013). A component of this work included a critique of the marriage of culture and commerce. In terms of art and media, Adorno and Horkheimer took issue with abstract goods and services becoming normalized and commercialized for the masses, forcing *culture* to transform from the domain of personal appreciation to that of commercial agents within the economy, a slippery slope proposition whereby *culture* could ultimately be reduced to "*the logic of monopoly capitalism*" (cited by O'Connor, 2013).

As the *Culture Industry* developed, governments around the globe developed policies and programs to support the growth of this loosely defined sector, primarily with the hope of economic growth and prosperity (Belfiore, 2018; O'Connor, 2010). More than seven decades after Adorno and Horkheimer's initial critique, there is little doubt about the relevance of what is now known as the *Cultural Industries* in global economic terms (Jeffcutt et al., 2000; Rodríguez-Gulías et al., 2018). What remains in doubt are the elements that comprise this evolving driver of value generation (Chapain & Sagot-Duvaurox, 2020; Jones et al., 2016; Lee, 2017; Monclús &

Arfaoui, 2017; O'Connor, 2013) and the need for government involvement within this domain. (Belfiore, 2015, 2018; Comunian et al., 2010; Monclús & Arfaoui, 2017; Oakley, 2004; Oakley & O'Brien, 2016).

Within the cultural industries, two processes were taking place simultaneously: the commodification of culture and the *culturalization* of the economy (Thiel, 2017).

While the *Culture* or *Cultural Industry* is not the focus of this study, it is essential to understand some of the critical challenges and shortcomings of the definitional boundaries of the Cultural Industries and how these challenges and shortcomings came to provide the foundations for the *Creative Industry or Industries*, a relatively new economic arena which some consider a child or sub-segment of the Cultural Industry (Chapain & Sagot-Duvaurox, 2020).

### Origin of the Creative Industries

Most of the literature reviewed by the researcher (Bakhshi et al., 2013; O'Connor, 2010; Rodríguez-Gulías et al., 2018; Thompson & Campbell, 2022) indicates that Creative Industries originated from the UK's Department for Digital, Cultural Media & Sport (DMCS), with this organization publishing Creative Industries Mapping Documents in 1998 (Department for Digital Cultural Media & Sport, 1998). This organization followed this initial publication with a revised set of documents in 2001 (Department for Digital Cultural Media & Sport, 2001), for which most other research done in this area references these two as the origin of *The Creative Industries*.

O'Connor hints that the transition from the historical roots of the Culture Industry to the Creative Industries was driven in large part by the New Labour Party being elected in the UK in 1997, liberating the more monetarily focused actors in the establishment of a new creative sector that was beyond 'the Arts' (O'Connor, 2010). The new government considered this separation necessary to protect *culture* from more corporate agents and provide the new 'sector' with an

identity complete with updated policy and funding instruments. This separation led to new sectoral segmentation through policy and industrial supports in the UK, leading to what NESTA has described as the *de facto* global standard for the classification of the Creative Industries (Bakhshi et al., 2013. p. 6).

Moore (2014) is one researcher who contradicts this global origin story, indicating the concept of Creative Industries first came to be associated with policy efforts in 1994 in Australia. The Australian government published "*Creative Nation*" as a cultural and economic policy document that provided funding for cultural institutions that supported IT and cultural elements enabled by digital media (Department of Communications and the Arts, 1994).

#### Example of Discipline Segmentation within the Creative Industries in the UK

Regardless of the first origins of the Creative Industries, O'Connor (2010) delivered a lengthy longitudinal study describing the path of different evolutions and segmentations of Cultural Industries over 60 years, leading to the birth of the Creative Industries in terms of policy efforts in the UK in the 1980s. A summary of this policy, as described by O'Connor, is as follows:

1. The use of technology as part of the defining anchor of the new Creative Industries;
2. The development of new markets, in opposition to a singular 'market' for creatives;
3. It created new, flexible work cultures;
4. It demonstrated the spatialization and specialization of focused products and services;
5. It further demonstrated the rise of small and medium-sized creative enterprises, which in turn provided for;
6. Additional support and growth channels for the Cultural Industries and the cultural economy – in other words, the two 'industries' could be considered synergistic with areas of intersection, yet separate and distinct in many cases.

While the debate regarding what can be considered residing within the Creative Industries continues, researchers have found "[T]here is a clear link between the development of

the Creative Industries and Information and Communication Technologies (ICT)" (Abbasi et al., 2017, p. 42).

### Differences between Cultural and Creative Industries

Jones, Svejnova, Pederson, and Townley (2016) identify much confusion about the different methods to categorize Creative Industries, their composition, and how they function. In the purest form, culture has a closer association with tradition and experience, whereas creatives and their activities have a stronger affinity with innovation and technology. Others have expressed an interest in separating cultural and creative policies because of this distinction (Monclús & Arfaoui, 2017). This narrative extends into the Canadian context in more recent publications, emphasizing the need for regional and local considerations (Thompson & Campbell, 2022). Regardless of the differences between the Cultural and Creative 'sectors, the peer research that was reviewed as part of this study leads the researcher to conclude that they are different yet related domains, a subject outside this research paper's core focus.

### Compositional Comparison of Disciplines in the Creative Industries, A UK Example

NESTA, the UK's innovation agency for social good, published "*A Dynamic Mapping of the UK's Creative Industries*" in 2013. This publication addressed what the authors considered to be inconsistencies within the *de facto* world standard for classifying the Creative Industries (Bakhshi et al., 2013). Nesta considered the *de facto* standard for Creative Industries to be the UK Department of Culture, Media and Sport (DCMS) Creative Industries Mapping Documents published in 1998 and 2001 (Department for Digital Cultural Media & Sport, 1998, 2001).

NESTA's 2013 approach to further defining the scope or spectrum of the Creative Industries was to tie specific Standard Occupational Classification (SOC) and Standard Industrial Classification (SIC) codes associated with disciplines of practice considered essential economic

activities within the Creative Industries. This approach was adopted by the DCMS in 2014. By 2015, a much larger population of organizations was participating in the dynamic mapping of occupations and industries comprising the core of the Creative Industries (Bakhshi et al., 2015). Participants in the 2015 exercise included government agencies, industry groups, and company inputs, including the STEM community and the IT sector. The following tables demonstrate the evolution of the categorization of the Creative Industries in the UK.

UK DMCS (2001)	UK NESTA (2013)
<b>Advertising</b>	Artistic creation
<b>Architecture</b>	Motion picture, video and television programme post-production
<b>Art and antiques markets</b>	Performing arts
<b>Crafts</b>	Radio broadcasting
<b>Design</b>	Photographic activities
<b>Designer Fashion</b>	Motion picture, video and television programme production
<b>Film and video</b>	Architectural
<b>Interactive leisure software</b>	Television programming and broadcasting
<b>Music</b>	Publishing of journals and periodicals
<b>Performing arts</b>	Specialized design activities
<b>Publishing</b>	Support activities for performing arts
<b>Software and computer services</b>	Media representation
<b>Television and radio</b>	Sound recording and music publishing activities
	Publishing of newspapers
	Advertising agencies
	Reproduction of recorded media
	Book publishing
	Other publishing activities
	Operation of arts facilities
	Pre-press and media
	Motion picture, video and television programme distribution
	Computer programming
	Clothing and accessories
	Retail sale of second-hand goods in stores
	Other retail sale of new goods in specialized stores
	Other software publishing

Table 1 – UK DMCS (2001) and UK NESTA (2013) Creative Industries Composition



The following table adds additional context regarding the evolution and complexities of how the UK has attempted to define the Creative Industries in terms of Standard Occupational codes (SOC) and Standard Industrial Classification (SIC) codes.

UK NESTA (2015)	UK NESTA (2015)
<b>Creative Occupations as Defined in SOC2010 Codes</b>	<b>Creative Industries as Defined by SIC2007 Codes</b>
<b>Advertising and Marketing Disciplines</b>	<b>Advertising and Marketing</b>
Marketing and Sales Directors	Public Relations and Communications Activities
Advertising and Public Relations Directors	Advertising Agencies
Public Relations Professionals	Media Representation
Advertising Account Managers and Creative Directors	
Marketing Associate Professionals	
<b>Architecture Disciplines</b>	<b>Architecture</b>
Architects	Architectural Activities
Town Planners	
Chartered Architectural Technologists	
Architectural Technologists and Town Planning Technicians	
<b>Crafts</b>	<b>Crafts</b>
Smiths and Forge Workers	Manufacturing of Jewellery and Related Articles
Weavers and Knitters	
Glass and Ceramics Makers, Decorators and Finishers	
Furniture Makers and Other Craft Woodworkers	
Other Skilled Trades	
<b>Design</b>	<b>Design: Product, Graphic and Fashion</b>
Graphic Designers	Specialized Design Activities
Product, Clothing and Related Designers	
<b>IT</b>	<b>IT Software and Computer Services</b>
IT and Telecommunications Directors	Publishing of Computer Games
IT Business Analysts, Architects, and Systems Designers	Other Software Publishing
Programmers and Software Development Professionals	Computer Programming Activities
Web Design and Development Professionals	Computer Consultancy Services

UK NESTA (2015)	UK NESTA (2015)
<u>Creative Occupations as Defined in SOC2010 Codes</u>	<u>Creative Industries as Defined by SIC2007 Codes</u>
<b>Film, TV, Radio, and Photography</b>	<b>Film, TV, Video, Radio and Photography</b>
Arts Officers, Producers, Directors	Motion Picture, Video and TV Programme Production Activities
Photographers, AV and Broadcast Equipment Operators	Motion Picture, Video and TV Programme Post-production Activities
	Motion Picture, Video and TV Programme Distribution Activities
	Motion Picture Projection Activities
	Radio Broadcasting
	Television Programming and Broadcasting Activities
	Photographic Activities
<b>Publishing</b>	<b>Publishing</b>
Journalists, Newspaper and Periodical Editors	Book Publishing
Authors, Writers	Publishing of Directories and Mailing Lists
	Publishing of Newspapers
	Publishing of Journals and Periodicals
	Other Publishing Activities
	Translation and Interpretation Activities
<b>Museums, Galleries, and Libraries</b>	<b>Museums, Galleries, and Libraries</b>
Librarians	Library and Archive Activities
Archivists and Curators	Museum Activities
<b>Music, Performing, and Visual Arts</b>	<b>Music, Performing, and Visual Arts</b>
Artists	Sound Recording and Music Publishing Activities
Actors, Entertainers	Cultural Education
Dancers and Choreographers	Performing Arts Activities
Musicians	Support Activities for the Performing Arts
	Artistic Creation
	Operation of Arts Facilities

Table 2 - UK NESTA (2015) Creative Industries Composition via SOC and SIC Codes

NESTA's 2015 documentation leans heavily on other organization's taxonomic breakdowns for both individuals and their field of occupation (SOC) and organizational or industrial practices (SIC), other standards could be leveraged to attempt to put a framework of understanding for what could be considered inside an industry – the North American Industry

Classification System (NAICS) is another. While outside the scope of this paper, these code references are being used to demonstrate the complexity of how industrial segmentation of Creative Industries has become, and how they evolve over time. Each of these classification schemes (SOC, SIC, NAICS) have their own critics (Whinney, 2022), as they are in and of themselves imperfect mechanisms to define occupations or industrial segments – making the compilation of defining an area such as the Creative Industries more imperfect than the standardizations used by others to define it.

#### [NESTA \(2015\) Common Coding between Creative and STEM or High-Tech Occupations](#)

NESTA's 2015 documentation identified the following overlap within their codification schema between the Creative Industries and STEM or High Tech Occupations, which Abbasi (Abbasi et al., 2017) described in his research. The intrinsic nature of IT in the Creative Industries is apparent in the UK with the use of the SOC2010 codes as demonstrated in Table 3. This is important to note that the inclusion of IT within the Creative Industries is expanding beyond the traditional context of creativity (Table 1 and Table 2) to include more *scientific* professions and organizational competencies (Table 3).

<b>SOC2010 Codes Common between Creative and STEM Occupations</b>
Information Technology and Telecommunications Directors
IT Business Analysts, Architects, and Systems Designers
Programmers and Software Development Professionals
Web Design and Development Professionals
<b>SIC2007 Codes Common between Creative and High-Tech Occupations</b>
Other Software Publishing
Computer Programming Activities
Computer Consultancy Services

Table 3 – Commonality Between Creative and STEM or High-Tech Occupations

Concluding the analysis of the literature on discipline or industry segmentation from a UK perspective, it is apparent that the Creative Industries is evolving over time, and that the complexion or taxonomy in which a region establishes to describe or define them is often based on Government definitions and programs that are built on imperfect coding systems like SIC or SOC codes.

#### [Composition of Creative Industries or Interactive Digital Media Sector in Canada](#)

Two industry-focused publications from the Canadian Interactive Industry Alliance (CIAIC) and Nordicity will be offered to demonstrate the different segmentations of what the researcher will posit as a more technology-focused understanding of the Canadian Creative Industries from the industrial perspective. CIAIC and Nordicity have created a branding of this sector in Canada, commonly referred to in industry circles as The Canadian Interactive Digital Media Industry, or IDM Industry in abbreviated form. (CIAIC, 2008; Nordicity, 2013)

Enhancing this understand is a more recent Government of Canada publication that outlines export support for the Creative Industries that references the Interactive Digital Media Industry as a component part of this government program. (Canadian Heritage, 2023)

#### [Canadian Interactive Alliance Industry Profile \(2008\)](#)

The Canadian Interactive Alliance published *The 2008 Canadian Interactive Industry Profile*. Within this publication, a detailed Canadian taxonomy for the Interactive Industry was offered, providing two high-level segmentations:

Digital content and environments with which users can actively participate or which facilitates collaborative participation among multiple users for the purposes of entertainment, information or education, and is commonly delivered via the Internet, mobile networks, gaming consoles or storage devices. The two essential sub-sectors of

the interactive digital media industry include the entities creating the end-user experience (creators) and those designing the applications allowing for the creation or distribution of the content and environments to the user (enablers). (CIAIC, 2008 p.20)

The 2008 CIAIC taxonomy segmenting Creators and Enablers is outlined as follows:

<b>Canadian Interactive Alliance Interactive Industry Profile (2008)</b>
<b>CREATORS</b>
<b>Entertainment / Arts</b>
Game Design and Development
Interactive Narrative
Original Art-based Interactive
Cross-platform Entertainment
<b>Education/Training</b>
Simulations and Interactive Training
Curriculum-based Interactive Education
<b>Marketing</b>
Advertising and Promotional Content
Branded Entertainment
Product Extensions
<b>Information/Social</b>
Social Networking
Mash-up Engines
Interactive Social Services
Interactive Information Services
<b>ENABLERS</b>
<b>Software Developers</b>
Software Design and Development
Java-Type or 'Write Once, Run Anywhere' Applications
<b>Distributors</b>
Software Publishers
Game Publishers
Portals/Aggregators
<b>Service Providers</b>
Animation
Graphics Rendering
Motion Capture and Scanning
Content Management Systems
Web Design and Development

Table 4 – 2008 CIAIC Interactive Industries Taxonomy

This 2008 framework is important because, in the researcher's opinion, it provides a distinct difference from any of the UK models described in previous sections, explicitly describes the industry in terms of content (Creators) and platform (Enablers) and paves a unique

perspective that drives a conversation around how pivotal Information Technology plays in this space.

### [Nordicity and Canadian Interactive Alliance Industry Profile \(2013\)](#)

Nordicity and The Canadian Interactive Alliance (CIAIC) published the "*2012 Canadian Interactive Industry Profile*." This publication provided a narrower definition than previous:

A company that creates digital content and environments that provide users with a rich interactive experience – either with content itself or with other users – for the purposes of entertainment, information, or education, or that provides services that directly enable these products/services. (Nordicity, 2013, p. 7)

This updated taxonomy was presented as follows:

<b>Canadian Interactive Alliance IDM (2012)</b>
Games developer
Mobile app developer
Transmedia production
Creator of interactive content for the web
Smart TV app developer
Social platform developer
Developer of e-learning material/platform
Web application developer
Interactive artist
Visual effects
IPTV platform or content developer
Business and/or Productivity Software
Compression technology
Website design
Video delivery software/services
Non-interactive news/sports applications and services
Digital content publishing

Table 5 – 2013 Nordicity and CIAIC Interactive Industries Taxonomy

This revised 2012 framework was offered as the authors had indicated the industry had shifted away from having an inextricable link between content and platform. This updated

definition was offered because it better reflected the creator side of the industry, but in the researcher's opinion, it takes a step away from (backwards, perhaps) in including IT as an essential ingredient in IDM.

### [Creative Industries in a Canadian Academic Context](#)

Toronto Metropolitan University's School of Creative Industries claims to have the first undergraduate program in Canada that explicitly focuses on the Creative Industries (Thompson & Campbell, 2022). Two instructors within this program wrote *Creative Industries in Canada*, an academic textbook, as a teaching aid for students to better understand the Canadian context of Creative Industries, including commercial and non-commercially specific cases and specific Canadian policy and industrial analysis. Thompson & Campbell (2022) felt that there was a longstanding reliance on British, Australian, and American content from scholars focused on their own local economic, social, and political relations relating to the dynamics of race, gender, sexuality, as well as inequalities and power dynamics. The taxonomy of the Creative Industries from this text is found in Table 6, compared to the original UK DMCS (2001) taxonomy and the Government of Canada's Creative Industries Export Strategy (Canadian Heritage, 2023) segmentation for visual comparison.

### [Canadian Heritage Creative Export Strategy](#)

The Federal government provides export support for Canadian entities looking to export products and services to for-profit and non-profit organizations. Support includes funding, trade mission engagement, and navigation services as parts of the program for both export-ready and developmental efforts. The Strategy provides a high-level taxonomy for organizational engagement, which is provided in Table 6 for reference and comparison purposes.



UK DMCS (2001)	Creative Industries in Canada (2022)	Government of Canada Creative Industries Export Strategy (2023)
Advertising	Advertising	
Architecture	Architecture	
Art and antiques markets	Visual and performing arts	Artistic Crafts
Crafts	Traditional broadcast media	
Design	Design, Graphic Design	Design
Designer Fashion	Fashion	
Film and video		
Interactive leisure software	New Media	Interactive Digital Media (IDM)
Music		Music
Performing arts		Performing Arts, Visual Art
Publishing		Publishing
Software and computer services		
Television and radio		Audiovisual
	Marketing	
	Information and Communication Technology (ICT)	

Table 6 –Taxonomy Comparison, UK and Canadian Examples

Regarding Table 6, it is important to note that Bakhshi, Freeman, and Higgs describe the 2001 UK DMCS taxonomy for framing the Creative Industries as the de facto world standard (Bakhshi et al., 2013), and as such, it is included as an important foundation pillar of the comparison presented in Table 6.

While the historical disciplines or industry descriptors in the UK segmentation from 2001 do not directly match the more recent Canadian taxonomic breakdowns (2022, 2023), there is some that do relate. Further, when compared to the segmentations presented in Tables 1, 2, 4, and 5, the more recent Canadian segmentations provided in Table 6 appear quite limited in terms of disciplines represented. It appears the Canadian segmentations have not evolved to the complexity of other regions, say the evolving UK models presented in Tables 1 and 2.

The researcher would conclude that companies that can be supported by the Creative Industries Export Strategy (2023), as offered by the Federal Department of Heritage in Canada,

can be greatly expanded when considering the makeup of Interactive Digital Media as highlighted in light orange in Table 6. While being governed by the *Department of Heritage* might suggest more of a Cultural or Creative flavour to this support program, the specifics of what types of companies supported is not well defined in documentation available publicly via the internet, the sectors of support expand the short list identified in Table 6 to include those disciplines listed in Table 4 and/or Table 5.

Including the CIAIC/Nordicity segmentations of the IDM industry from previous, it is apparent that defining the sector in a Canadian context is a relative exercise that depends on the time the segmentation was completed, and under which model the industry is being segmented into. The researcher offers the next section for consideration of a more universally agreeable model for the Creative Industries and the IDM Industry, rather than a segmentation of different individual disciplines or organizational outputs.

#### [Observations on a Model for Creative Industries / IDM Industries in Canada](#)

Various taxonomies exist within the academic literature and industry publications to capture individual disciplines and organizational focus areas and their characteristics or elements to categorize them within the Creative Industries. These taxonomies can be fluid, changing over time to reflect policy, environmental, political, and economic considerations. Based on the analysis of the academic research and industry publications within Chapter 2, the current research shows that the Creative Industries are effectively comprised of Creatives, Technologists, and Businesses within a larger milieu of the local or regional economic environment. The researcher has created the following Venn diagram as a theoretical framework to encapsulate the disciplines within an organization in order for it to be considered an entity within The Creative Industries (Figure 1) without having to describe individual professions or

disciplines within an organization's product(s) or service(s) by way of governmental coding schemas.

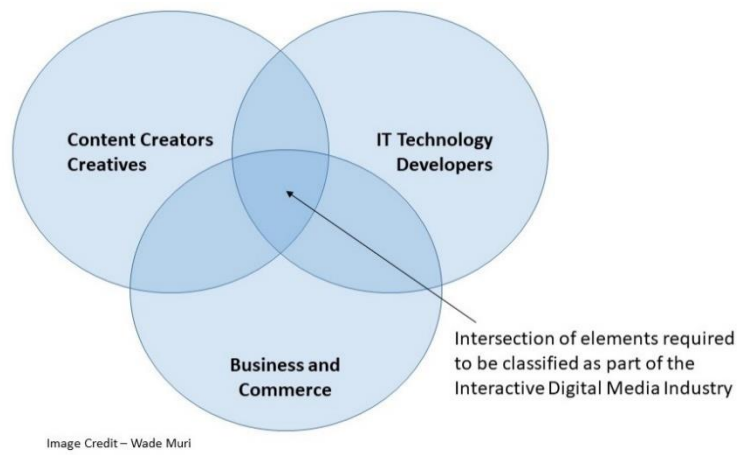


Figure 1 – Suggested Model for Creative Industries / Interactive Digital Media Industry

The Model being presented in Figure 1 most closely represents the 2008 CIAIC Interactive Industries segmentation, but explicitly calls out the need for IT involvement as well as *the need for commercial attachments to the model to be considered an industry*. As Thompson & Campbell have offered, “...if a creative industry is not fostering wealth creation, does it still count as a creative industry?” (Thompson & Campbell, 2022; p. 5) The researcher created this model to illustrate the role IT plays as a central pillar in the scalable delivery of creative content, and includes wealth creation as a consideration within an industrial or business context. This model can be of value for other research and programs supporting industry development into the future. The Creative Industries involve more than just *creativity*, technology and business play an integral role in this economic area.

### Challenges within the Creative Industries

While the Creative Industries have often been considered open, diverse, egalitarian, meritocratic and *cool* (Brodmerkel & Barker, 2019; Conor et al., 2015), there is a growing body of research that refutes these attributes (Brook et al., 2021) with demands for further research

work be completed as policy and tax dollars are often funding the dysfunction within them (Conor et al., 2015). This next section will identify some of the more prominent issues identified within specific practice areas by the research community as they pertain to this study, starting with gender-based issues.

### Ageism in the Creative Industries

As *cool* and egalitarian as the Creative Industries marketing might reflect, ageism also plays a substantial role. While the literature on gender disparities in this area is much richer and broader, the following studies focus on age-related issues in specific practice areas.

Broadmerkel and Barker completed a qualitative analysis of interviews with 22 experienced creatives with more than ten years of experience (18 males and four females) working in Australia's advertising industry (Broadmerkel & Barker, 2019). Within this study, it is noted that their research review hinted that, with few exceptions, “...*the issue of age inequality has received almost no attention in critical studies into creative work*” (p.1385) and that “...*ageism is significantly worse in the advertising industry than the British workplace average*” (p. 1386) by a factor of almost three hundred percent. Curiously, this study provides us with the notion of a *glass wall* that would accompany what has been described as a *glass ceiling* within the advertising industry, effectively boxing middle-aged staffers in their field should they be able to overcome their age barriers to entry or exit employment with an agency in this field of practice; where there are barriers for younger employees entering the field for paid work, but more importantly, the relative absence of places for *the old boys' network* to exist within an advertising agency.

Comparing this study to one completed in the Netherlands (Hennekam, 2015), a similar theme emerges regarding this figurative ageist *glass box* regarding older creatives. A qualitative

study of interviews from 43 older self-employed creatives in the Netherlands was analyzed and sampled from a broad suite of practices across the Creative Industries space, as defined by a national trade union of a potential 4,286 participants. Here, age was the only selection category, where participants ranged from 51 to 67 years old, with an average of 61.3 years. This study synthesized four primary age-related themes, with three being negative: early retirement or forced self-employment, decreased income based on perceived staleness or age-related inabilities as a freelancer, and the need to internally harmonize the notion of a dual identity (creative actor within an agency vs. entrepreneur).

### Gender in the Creative Industries

One of the more disturbing events relating to gender in the Creative Industries started in the summer of 2014 and carried over into the winter months of 2015. What began as an online attack against a female video game developer spiralled into an online campaign of hate directed primarily at females but spilled over into other areas, such as race. *#gamergate* was well covered in the media, as fueled by what was considered white male gamers that rallied via social media networks.

Most media outlets reported that the initial target was Zoe Quinn (Greengard, 2023; Massanari, 2015). The attacks stemmed from claims of impropriety by Quinn's former boyfriend over the success of a game title she had released in 2013, titled *Depression Quest*, which focused on mental health issues. The firestorm 'movement' against women in the gaming community, and females in general in creative professions, was considered by some to be a form of misogynistic terrorism (Greengard, 2023).

Discrimination against females isn't new to the Creative Industries, but this series of events was, ironically, fuelled and fed by the technologies that support the community's growth (Massanari, 2015). #gamergate brought these behaviours into the media spotlight for discussion.

Gender discrimination and sexism aren't exclusively gaming issues, and while public media outlets such as Forbes have exposed these gender issues to the public (Davis, 2018), there have been various calls by academics to expand research efforts in this area of study (Brook et al., 2021; Conor et al., 2015; Dent, 2020; Duffy, 2016).

Globally, Conor et al. reviewed various global literature from across Western Europe, the UK, the USA, Canada, New Zealand and Australia within the Creative Industries (Conor et al., 2015). Among the myriad of findings within this study, inequities in gender, sexism, and class were identified as areas that were interrelated and worthy of consideration in future research efforts.

Following this study, a 2021 mixed-method study was published based on participants from across the Cultural and Creative Industries in the United Kingdom, in which 2487 unique online survey responses were submitted with 237 follow-up interviews taking place (Brook et al., 2021). The 237 interviews drew 32 senior decision-making males from the interview pool from various practice areas defined by the UK's Department for Digital, Cultural Media & Sport (DMCS). The 32 men in power were asked to discuss inequalities within their organizations, and the discussions tended to indicate senior leaders are more than casually aware of gender biases and sexism within each field. While the participants were open with their responses in the 'inequity talks,' the researchers concluded it wasn't necessarily in support of challenging it, instead indicating it may be a new hidden barrier to progress. While participants were aware of these inequity issues, it was felt they found the process to be a necessary discourse to 'get in and

get on' in their organizations. Progress in resolving gender issues was not being made; instead, lip service was being paid with gender equality needing no active intervention.

Of interest relating to northern environments like Edmonton is a study providing evidence that location, industrial history, and cultural and creative clustering can play a factor in gender-based issues within the creative industries (Milestone, 2016). Edmonton's history, industrial complexion, and makeup of current creative industries could be considered similar, if not a more historically youthful comparison, to this study focused on Manchester, England. Within this study, the research findings note that although Manchester has the most significant number of people working within the Creative Industries outside of London, there is a significantly lower number of female actors than per-capita UK findings. Milestone suggests that Manchester's industrial history, starting in the mid 1700's, has, in part, played a significant role in nurturing a culture of "*laddishness*" in which a masculine skew has developed to create a gender imbalance.

Several additional research studies were reviewed to seek answers to the reasons why gender disparities were present in the Creative Industries and the adjacent STEM fields, for which a wide variety of contributing factors were discussed (Brook et al., 2021; Dent, 2020; Duffy, 2016; Kijima et al., 2021; Makarova et al., 2019; O'Brien et al., 2016; Oakley et al., 2017; Oakley & O'Brien, 2016; Wang et al., 2013, 2015).

Within these studies, gender-based issues were identified as prevalent for a spectrum of reasons; for this study, they have been found to exist globally and are worthy of additional investigation but fall outside the scope of this research work.

### Gender, Age, and Remuneration in a Canadian Context

A study on young actors attempting to break into the Creative Industries provides a Canadian context regarding (Campbell, 2020). The research within this study was formed from an anonymous online questionnaire in English and French, targeting individuals aged 18-35 working in any self-declared creative industries field.

Three hundred nineteen (319) responses were collected, with open-ended questions collecting data on age, race, education, employment durations, income, and hours worked, including unpaid hours. The research results provide some interesting items to consider. More than 67% of respondents identified as female, with just under 75% identifying as Caucasian. While the gender imbalance is expected, it favours a different gender than the national average. More than 59% indicate completion of a Bachelor's Degree, and slightly more than 21% have declared having a post-graduate degree (Master's at >21%, Doctorate at <1%). Self-employment rates were reported at 60%, with 66% reporting that they did not receive regular weekly revenue from work within their creative discipline and that this irregular income averaged \$11,000 annually across the study population. 34% of respondents reported regular income streams working within their field of study, earning on average \$37,000 annually (Campbell, 2020).

Campbell (2020) also identified forty-two percent of respondents also reported working in more than one discipline; with 24% of the 42% reporting working in a third discipline. Further, approximately half of the respondents reported having a second job working outside of their field of study in a non-creative field, and there were strong indications that those working outside of their field of study were working close to full-time hours, earning an average of \$23,000 from this non-creative work.



When considering the approximate average of a creative worker taken from Statistics Canada (Statcan, n.d.-a) to an average of \$16.08 per hour in 2018 (for context, the technical occupations in art, culture, recreation and sport were selected as the closest approximation to the NAIT student population analyzed in Chapter 4), working a full-time position at 2080 hours per year (Statcan, n.d.-b) yields an annual salary of approximately \$33,450.00.

In short, this Canadian study demonstrates that younger age groups remain outside the *glass box* of employment within the Creative Industries research previously discussed in this section. It indicates a level of underemployment for young creatives in Canada.

#### Area of Study and Opportunity in the Creative Industries

A 2011 study of students in the UK (Comunian et al., 2011) concludes that while some graduates heading into employment in creative industries find golden opportunities, most face uncertain and unfavourable labour market conditions, lacking sustainable career paths. In analyzing this less-than-ideal job market prognosis, the researchers found that the best job stability and economic rewards resided within advertising, architecture, writing, and publishing. Graduates entering performing arts, film and television, and fine arts and crafts faced the most uncertainty and much lower economic benefits. The researchers hint that economic policy and the promotion of opportunities within the Creative Industries have created an excess of new student enrollments in these program areas. Further, the researchers in this study request that further longitudinal studies be warranted to evaluate these findings in the UK and other regions.

A 2015 study of students in Australia (Daniel & Daniel, 2015) discusses similar challenges in terms of limited opportunities and instabilities for students entering careers in creative industries, suggesting that Work Integrated Learning (WIL) and student internships can provide better market entry opportunities by way of exposing students to more industry contacts,

expanding their network and to adjacent career options. The researchers concluded that tertiary post-secondary experiences may add value to secure employment opportunities and pay for creative industry students. Again, the researchers call for further enquiry and longitudinal study.

Following this thought process, a 2018 study (Segarra et al., 2018) focused on Science, Technology, and Math (STEM) students hints at a similar approach in providing more creative or arts-focused education and training to assist with recruiting, training, and retaining a more effective and sustainable workforce. By adding Arts to STEM, STEAM strategies complement rigid, conventional approaches to education, permitting students to exercise creative, innovative thinking approaches. Additional longitudinal studies would be required to evaluate the research conclusion.

A 2019 study on Australian universities provides additional longitudinal analyses of student opportunities post-graduation (Jackson & Bridgstock, 2019). Three universities' student data from graduates of Business or Creative Industries undergraduate programs were analyzed and collected by an online survey containing survey questions that included objective and subjective measures of career outcomes as reported by individuals. Graduates surveyed were selected based on one of the two characteristics: either in an employment capacity one to two years post-graduation or four to five years post-graduation. Key findings from this study are summarized as follows:

1. Creative Industries graduates tend to operate in a more precarious labour market environment;
2. Creative Industries graduates perceive themselves as needing to engage in multiple concurrent or overlapping roles to achieve full-time equivalency and pay relative to other fields of employment;

3. Creative Industries graduates engage in relatively high levels of casual and self-employment, with recurrent attempts to obtain or create work;
4. Creative Industries graduates were more likely to define career success in terms of earnings and job security. In contrast, Business graduates were more likely to define career success in terms of learning, skill development, and advancement (Jackson & Bridgstock, 2019).

While this study indicated that details of gender, age, and graduation programs were collected within the participant survey, analysis and concluding remarks relating to these specific areas were not provided (Bridgstock, 2019). The lack of this analysis is unfortunate, as the research contained within this study would have benefited if it had been used to provide a vehicle for direct comparisons to the student data analyzed in Chapter 4.

#### [Inequities in Student Internships](#)

While outside of the core focus of this paper, a 2015 study focused on qualitative responses from twelve Canadian student interns seeking employment within the Creative Industries (Shade & Jacobson, 2015) repeatedly identified unpaid internships as standard, and that parental support was vital in seeking work experience and connections within the industry to secure meaningful employment. Within this study, Shade and Jacobson (2015) found that class played a significant factor in student success, as without family financial support, employment options by way of unpaid internships were not viable within a competitive workplace. Further, work and economic benefits are devalued by way of unpaid internships, including wage erosion and the displacement of existing paid employees by lower paid/unpaid recent graduates.

Comparisons and conclusions relating to the previous findings of the literature review found in this Chapter, as well as those from the NAIT student data analysis in Chapter 4 will be provided in Chapter 5.

## CHAPTER THREE – METHODOLOGY AND RESEARCH DESIGN

### Purpose of this Study

The primary objective of this study was to analyze student data within different educational program streams and assess how these academic programs affect student employment and income over a five-year period. This analysis will be focused on the model provided in Chapter 2 and the analysis of the following independent variables within the data provided:

- Age;
- Gender;
- Reported Salary;
- Reported Salary and Gender.

The secondary objective of this study was to provide a foundational framework for understanding the global Creative Industries landscape and the Interactive Digital Media (IDM) Industries within a Canadian context.

Understanding the composition of the Creative Industries and the Interactive Digital Media Industry was necessary to develop an understanding of the taxonomy supporting the analysis contained within the analysis of student data. The primary objective was achieved by analysing students within diploma programs within NAIT's Department of Media Innovation and Communication Technologies, as segmented into age, gender, and program of specialization at graduation associated with reported salary. This analysis also includes inequities in employment opportunities including gender and age.

The secondary objective of this study was achieved based on the analyses of peer-reviewed academic journals and other publicly available, relevant industry information, which will be utilized to support the primary objective. This chapter will utilize the model developed within Chapter 2 to support the connection of the secondary objective of this study with the first.

## Research Design

This study uses a quantitative methodology, utilizing two distinct secondary data sets provided by NAIT's Office of the Registrar and NAIT's Office of Institutional Research. The data was provided for 15 different diploma-level program streams of interest.

## Selection of Participants, Data Collection, and Validation

NAIT's Office of the Registrar collects data on individual students, starting with the admission process and ending with either a student terminating their education at NAIT or completing their studies through to graduation. Each student record includes gender, age, program emphasis, and program of specialization or graduation for those students completing their studies. Information relating to students who terminated their educational program was not made available. This data set contained 1454 distinct student records. A copy of NAIT's Office of Institutional Research survey instrument used to collect the data analyzed within this study is available in Appendix A.6.

NAIT's Office of Institutional Research collects data on student graduates, among other topics of interest to the institution, through a survey instrument. This data is collected under a voluntary program with yearly surveys that collect statistics on gender, age, and program of completion. Also included within these survey instruments are optional data fields that include annual salary information and employment-related details provided by each individual relating to the student's completed program of study. This data set contained 656 distinct individual records.

While the secondary data provided by NAIT's Office of the Registrar is expected to be accurate by way of validation by the Registrar, the secondary data collected by NAIT's Office of Institutional Research is not validated by the institution as each participant provides the survey data under a voluntary, anonymous process.

### NAIT's Office of Registrar Data

NAIT's Office of Registrar's data set included the following programs of study and segmentation within each:

1. Digital Media and IT –Animation
2. Digital Media and IT – Application Development
3. Digital Media and IT – Business Analyst
4. Digital Media and IT – Computer Software Development
5. Digital Media and IT – Digital Cinema
6. Digital Media and IT – Game Design
7. Digital Media and IT – Game Programming
8. Digital Media and IT – Systems Administration
9. Digital Media and IT – Visual Communication
10. Digital Media and IT – Web Design and Development
11. Digital Media and IT – General
12. Graphic Communications
13. Photographic Technology
14. Radio and Television – Radio
15. Radio and Television - Television

This data set included the year and term of graduation, gender, and age at graduation.

### NAIT's Institutional Research Data

Within NAIT's Institutional Research data set there included the following programs of study and segmentation within them:

1. Digital Media and IT
2. Graphic Communications
3. Photographic Technology
4. Radio and Television – Radio
5. Radio and Television - Television

While this data set included year and term of graduation, gender, perceived relatedness between current employment and program of study, and reported salary within their current employment, it did not include segmentation of student specialization within the Digital Media and IT program.

## Data Analysis

The analysis completed within this study spans five years of anonymized student information from academic years 2012 to 2017. Microsoft Excel was used as the primary tool for data analysis to calculate the following:

- Percentages of students within each program area and area of specialization at graduation;
- Percentages of students relating to binary gender detail, including program area;
- Average age information relating to program of study;
- Skewness and kurtosis of student ages relating to program of study;
- Association of student programs of study to taxonomy developed in Chapter 2, including percentage of student population per program, gender, average ages and average ages in terms of gender;
- Average reported salary, skewness, and kurtosis detail for each area of specialization at graduation;
- Comparison of responses relating to gender as well as average salary difference comparison detail per area of specialization at graduation;
- Comparison of area of specialization at graduation, gender, and reported relatedness of employment to area of specialization;
- Comparison of average reported salary data to area of specialization at graduation;
- Percentage gender differences versus overall IDM segmentation;
- Comparison of average reported salary information by binary gender detail in terms of relatedness of employment to area of specialization at graduation;
- Comparison of average salary to StatCan salary by area of specialization at graduation, gender, and relatedness to area of specialization.



## Ethical Considerations

The research contained within this study was approved by Dean Karaphillis by way of formal Research Proposal as a final Applied Research Project Proposal on March 23rd, 2018. This approval can be found in Appendix A.1.

Despite anonymized secondary data, the researcher required approval from Cape Breton University's Research Ethics Board based on the research nature of this study. Additionally, the researcher required additional approval from NAIT's Research Ethics Board based on the data and analysis required for this study. Both REB approval letters from NAIT and Cape Breton University are provided in Appendix A.3 and A.4.

An additional Freedom of Information and Protection of Privacy (FOIP) agreement was required, the "Agreement to Access to Personal Information for Research or Statistical Purposes" between the researcher and NAIT. This agreement is in Appendix A.5.

Further, the researcher has completed the National Research Council's *Tri-Council Policy Statement Ethical Conduct for Research Involving Humans Course on Research Ethics* (TCPS 2: CORE Course). A copy of the researcher's TCPS 2 certificate is in Appendix A.2, along with the Primary Supervisor Ethics Approval in Appendix A.7.

The researcher has not received funding for the completion of this study and has not paid others a fee for the completion of this study. The researcher discloses that this study does not involve real or apparent conflict of interest due to or in connection to this study or the research findings.

## Limitations of Study

It is important to note that while NAIT's Office of the Registrar's data sets are validated and replicable, the responses exist within NAIT's Institutional Research data, specifically annual reported salary and employment relatedness, and cannot be validated and are not explicitly associated with the student records analyzed within the Registrar's data set.

The original research proposal for this study included the following areas for analysis:

1. Is there a correlation between age and time to employment?
2. Is there a correlation between age and salary?
3. Is there a correlation between gender and time to employment?
4. Is there a correlation between gender and salary?
5. Is there a correlation between gender and the program of study?
6. Is there a correlation between age, gender, salary, and program area of study?

The data provided by NAIT does not include time to employment post-graduation information, so questions 1 and 3 could not be addressed as part of this study. Further, there are limitations regarding the lack of program of study breakdown details within NAIT's Institutional Research data concerning the digital media and IT student data, which will prevent inferences between the analyses of the two data sets in terms of these areas of specialization.

Within NAIT's Institutional Research data, graduates of the Digital Media and IT program are represented as a blend of distinct academic programs within the Registrar's Office data. As such, they cannot be assigned to a specific discipline as it is unknown what technical, creative, or business education levels each student record experienced within this larger classification of graduate student disciplines. This has created a gap in the breakdown of disciplines (creative, technical, business) presented in Chapter 4.

Adding to this, a wealth of other considerations should be considered as limitations in terms of the analysis provided within this study. These include, but are not limited to:

- Macroeconomic conditions within the region, where in-demand skills in these fields and salaries for students could be skewed based on supply and demand;
- Qualitative data considerations within the analysis;
- Analysis is on students within a single Alberta-based polytechnic, for which the analysis cannot be considered generalizable;
- Portability across other institutional types (Polytechnic, University, College);
- Portability across local, regional, and international locations.

### Researcher Background

The researcher is a graduate of two different Information and Communications technology programs and has worked in technical and business development capacities within for-profit organizations for over 20 years.

Additionally, the researcher has worked as an industry development agent in the Information and Communication and Technology (ICT) Industries Branch within the Government of Alberta for more than five years. During this time, he helped establish projects linking industry with academics and entrepreneurship development activities within post-secondary institutions within the province.

Entrepreneurship development activities spanned two different areas of practice: *technically focused* students within the Faculty of Engineering at the University of Alberta and *artistic and creative* students within the Alberta College of Art and Design (ACAD) before its rebranding as Alberta University of the Arts. During this time, the contrast between students within these two programs became a subject area of substantial personal interest to the researcher.

### Disclosure of the Researcher

The researcher has participated in several academic programs and for-profit organizations considered part of Creative Industries, including being a former Director for Digital Alberta. During the initial stages of development of this research study, the researcher was employed as a Director of the NAIT Centre for Innovative Media, for which the National Research Council covered a portion of the researcher's salary under the Innovation Enhancement Grant program, as well as Provincial funding from the Government of Alberta by way of the Ministry of Advanced Education and Technology. No funding was directly provided to support the completion of this study. Based on this disclosure, the researcher declares that the research contained within this study was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

**CHAPTER FOUR – DATA ANALYSIS AND DISCUSSION**

In this Chapter, the two data sets provided by NAIT were analyzed and compared to each other and with the findings from the literature review in Chapter 2.

NAIT provided two distinct data sets for analysis from programs of study within the NAIT School of Applied Sciences and Technology. NAIT's Office of the Registrar provided the first data set, and NAIT's Office of Institutional Research provided the second. These two data sets can be considered related yet separate and distinct. While the student data represented information from the academic calendar years of 2012-2107, one data set represented students participating in academic programs (verifiable data). The second data set was formed from voluntary responses from students who had graduated from the same academic programs.

The researcher has developed all tables, images, and graphics in this Chapter.

NAIT's Office of the Registrar data set included seasonal program start information (Winter, Spring, Summer, Fall) along with binary gender categorization detail and expected age at graduation information that was segmented into the following areas of study/specialization:

- a. Digital Media and IT - Animation;
- b. Digital Media and IT - Application Development;
- c. Digital Media and IT - Business Analysis;
- d. Digital Media and IT - Computer Software Development;
- e. Digital Media and IT - Digital Cinema;
- f. Digital Media and IT - Game Design;
- g. Digital Media and IT - Game Programming;
- h. Digital Media and IT - Systems Administration;
- i. Digital Media and IT - Visual Communication;
- j. Digital Media and IT - Web Design and Development;
- k. Digital Media and IT – General;
- l. Graphic Communications;
- m. Photographic Technology;
- n. Radio and Television - Radio;
- o. Radio and Television - Television.

NAIT's Office of Institutional Research data set included the following information provided by each student voluntarily through a post-graduation survey instrument:

- Program of graduation information, segmented into:
  - o Digital Media and IT (no program area of specialization information);
  - o Graphic Communications;
  - o Photographic Technology;
  - o Radio and Television (Radio);
  - o Radio and Television (Television).
- Academic calendar year of graduation;
- Binary gender classification (M/F);
- Subjective self-classification of work-relatedness to the program of study the student graduated from that included:
  - o Not at all related;
  - o Somewhat related;
  - o Very related.
- Reported gross annual salary, rounded to the nearest \$10.

### Analysis of the NAIT Office of the Registrar Data

The researcher has developed the following legend, which is being provided to give the reader a visual representation of colour coding that matches the ranges provided for skewness and kurtosis values represented in this chapter.

#### Skewness Values

>-1	-1	-0.5	0	0.5	1	>1
Very High Negative	High Negative	Moderate Negative	Symmetric	Moderate Positive	High Positive	Very High Positive

Table 1 – Skewness values with range colour coding

#### Kurtosis Values

<3	0	>3	>4 and < 6	> 6 and < 8	> 8 and < 12	> 12
Platykurtic  Flatter	Normal	Leptokurtic  Slight Peak	Taller Peak	High Peak	Very High Peak	Extremely Leptokurtic  Extreme Peak

Table 2 – Kurtosis values with range colour coding

Emphasis	% of Students	% Male	% Female	Average Age	Age Skewness	Age Kurtosis
Animation (DMIT)	3.65%	60.38%	39.62%	29.0	2.68	7.80
Application Development (DMIT)	3.17%	76.09%	23.91%	26.3	1.43	1.21
Business Analyst (DMIT)	4.27%	67.74%	32.26%	25.4	1.62	3.26
Computer Software Development (DMIT)	8.81%	71.65%	28.35%	25.2	1.47	2.59
Digital Cinema (DMIT)	3.44%	71.43%	30.61%	23.3	1.25	1.78
Game Design (DMIT)	3.85%	76.36%	25.45%	24.0	2.39	6.90
Game Programming (DMIT)	2.68%	97.44%	2.56%	23.8	2.22	6.69
Systems Administration (DMIT)	5.64%	81.48%	18.52%	24.8	2.97	12.01
Visual Communication (DMIT)	4.34%	33.87%	67.74%	24.3	1.03	0.11
Web Design and Development (DMIT)	7.85%	62.83%	38.05%	25.2	2.94	13.81
General (DMIT)	15.00%	73.73%	26.73%	25.8	1.56	2.40
Graphic Communications (DMIT)	11.29%	36.20%	64.42%	23.7	2.41	7.13
Photographic Technology	7.71%	17.12%	83.78%	24.0	3.84	20.32
Radio	7.85%	68.14%	33.04%	23.6	2.34	6.61
Television	10.46%	48.03%	52.63%	23.3	3.85	23.11
Entire Data Set	100%	59.33%	40.67%	24.5	2.50	9.93

Table 3 – Registrar Data Breakdown by Gender and Age



Table 3 demonstrates gender segmentation, age, associated skewness, and kurtosis values for student data within program areas. The following observations can be made from the data in Table 3 based on the analysis of the researcher:

1. There are slightly more male students in the programs of interest than females (59.33% vs 40.67%).
2. The average age of students in the programs of interest is 24.5 years old.
3. The age data is asymmetrical and heavily positively skewed across all programs of interest (2.5 positive skewness, right-tailed).
4. The kurtosis value for age data indicates a very high peak (9.93).
5. The largest student counts in the program areas of study, representing more than 10% of the overall student counts, are within the General stream of the DMIT program (15%), the Graphic Communications stream of the DMIT program (11.29%), and the Television program (10.46%).

### Segmentation Taxonomy

The researcher offers the following segmentation based on the literature reviewed in Chapter 2. Utilizing this suggested segmentation provides a model that will permit comparisons of data sets analyzed within this Chapter to findings from the Literature Review in Chapter 2. Further, it supports the model proposed in Chapter 2 (and repeated below) as it provides a more universal mechanism for comparisons outside of this study.

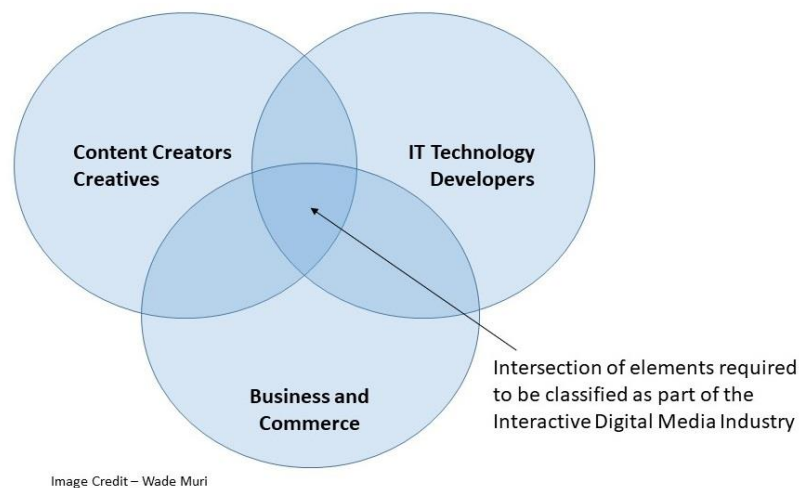


Figure 1 – Model for Creative Industries / Interactive Digital Media Industry

### Matching Program Focus to Segmentation Taxonomy

Based on the taxonomy developed in Chapter 2, the NAIT student programs have been segmented into technical, creative, and business programs based on the researcher's understanding of the technical intensity, creative intensity, and business intensity within each area of study as follows:

#### Technical Programs

- Digital Media and IT – Application Development
- Digital Media and IT – Computer Software Development
- Digital Media and IT – Game Programming
- Digital Media and IT – Systems Administration
- Digital Media and IT – Web Design and Development
- Digital Media and IT – General\*

#### Creative Programs

- Digital Media and IT –Animation
- Digital Media and IT – Digital Cinema
- Digital Media and IT – Game Design
- Digital Media and IT – Visual Communication
- Digital Media and IT - Graphic Communications
- Photographic Technology
- Radio and Television – Radio
- Radio and Television – Television

#### Business Programs

There exists only one business program within the programs analyzed, which is:

- Digital Media and IT –Business Analysis

The segmentation of these programs in terms of what comprises a technical or creative program relates to the amount of STEM-related content within the field of study. While it could be argued that some elements within a technical program are creative, and some elements within a creative program are technical, the primary focus of STEM-related educational content was the deciding factor in this segmentation.

As mentioned in Chapter 3, the general program stream within the Digital Media and IT program represents a blend of academic programs and cannot be assigned to a specific discipline. It is unknown what technical, creative, or business education levels each student within this pool experienced, which limits the analysis in this section of the study.

Generating a table of programs of study mapped to the offered Taxonomy from Figure 1 provides the following for reference.

<b>Business</b>	<b>Creative</b>	<b>Technical</b>	<b>Blended</b>
Business Analyst	Animation	Application Development	DMIT General
	Digital Cinema	Computer Software Development	
	Game Design	Game Programming	
	Visual Communication	Systems Administration	
	Graphic Communications	Web Design and Development	
	Photographic Technology		
	Radio		
	Television		

Table 4 – List of Program Areas Mapped to IDM Disciplines

The following IDM segmentation pie charts (Figure 2) are visual references to the breakdown of the IDM segmentation percentage based on total student numbers.

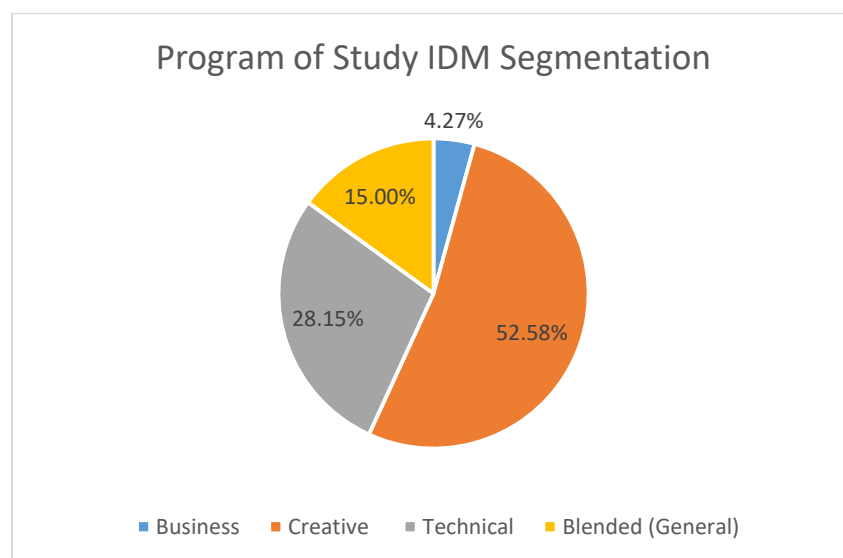


Figure 2 – Program Representation in IDM Areas as % of Overall Student Population

The following table was generated within this new segmentation of programs within the IDM Industry (Table 5).

<b>Emphasis</b>	<b>% of Students</b>	<b>% Male</b>	<b>% Female</b>	<b>Average Age</b>	<b>Average Age Male</b>	<b>Average Age Female</b>	<b>Age Skewness</b>	<b>Age Kurtosis</b>
Business	4.27%	67.74%	32.26%	25.4	25.4	25.4	1.62	3.26
Creative	52.58%	46.73%	53.27%	23.7	23.8	23.5	3.25	17.37
Technical	28.15%	74.08%	25.92%	25.1	24.8	25.9	2.26	7.48
Blended (General)	15.00%	73.39%	26.61%	25.8	25.3	27.2	1.56	2.40

Table 5 – % Inclusion of Student Data Segmentation within an IDM Framework

What is interesting about the student data, when compiled in terms of the IDM segmentation, is that the Creative student population's average age tends to be younger than the students in the other program areas (approximately two years younger in terms of the IDM segmentation average age, one year younger than the average age across all programs) and is relatively evenly distributed in terms of gender when compared to the other IDM disciplines and the individual program areas represented in Table 3. The exception to this would be the Television program, which is the closest regarding gender equality in student numbers. These comparisons will be further discussed in later sections of this Chapter.

Gender Breakdown by Model Discipline

Dividing each discipline into genders, the following pie charts are provided for reference.

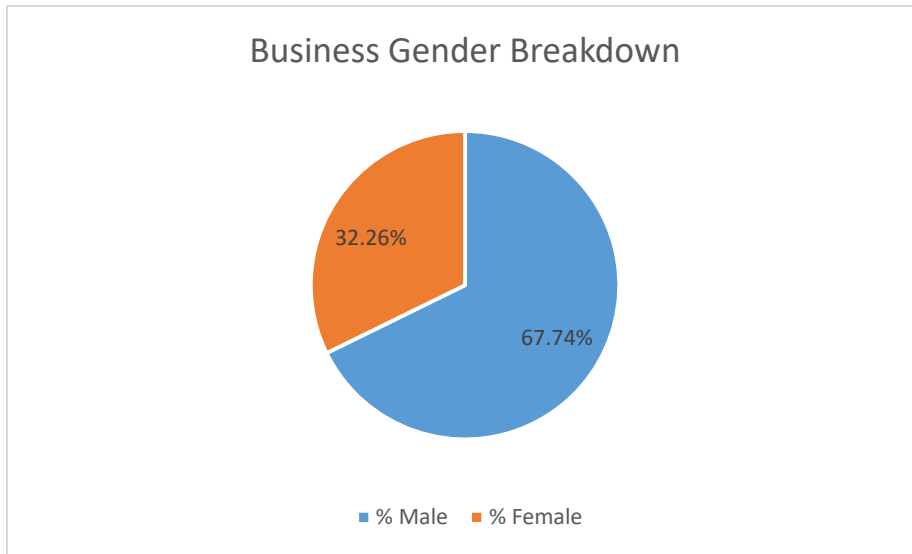


Figure 3 – % Gender Breakdown, Business Segment of the IDM Industry

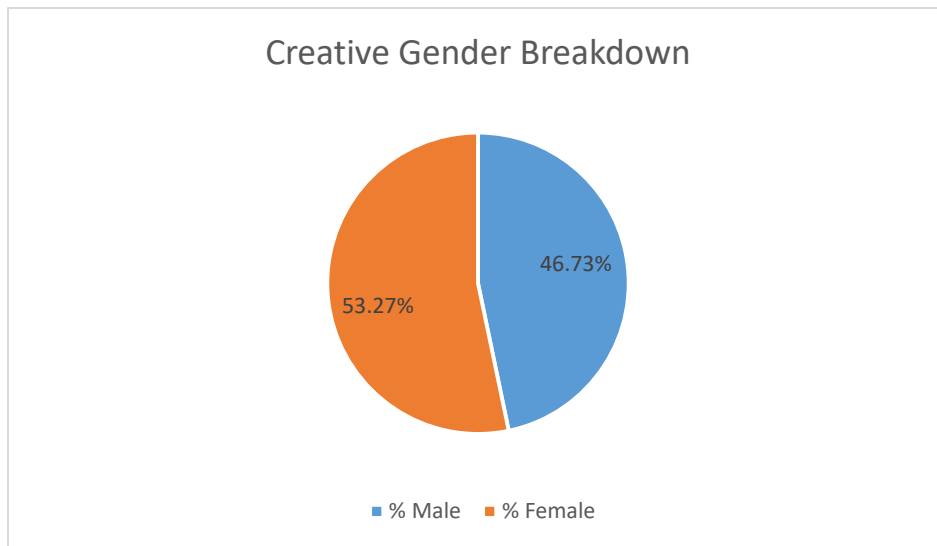


Figure 4 - % Gender Breakdown, Creative Segment of the IDM Industry

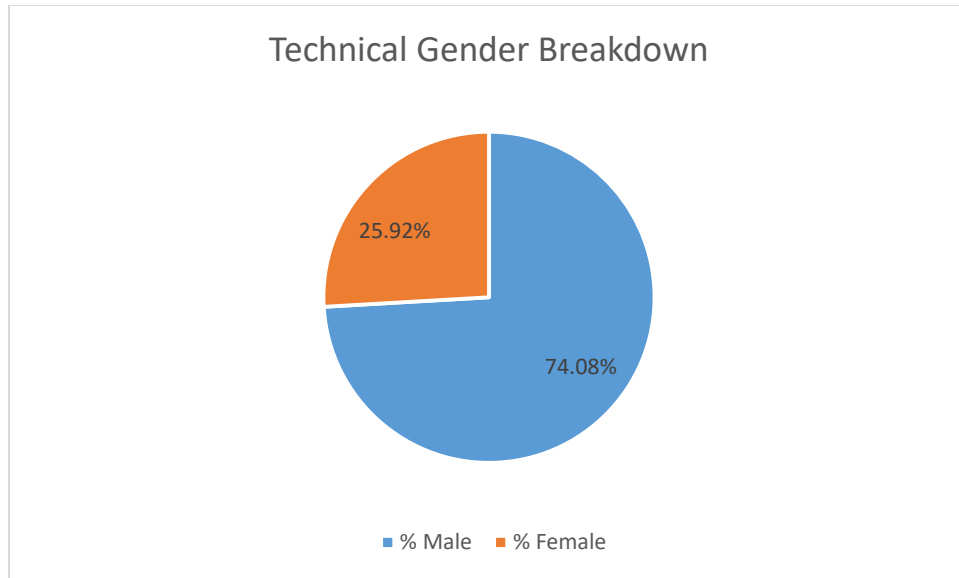


Figure 5 - % Gender Breakdown, Technical Segment of the IDM Industry

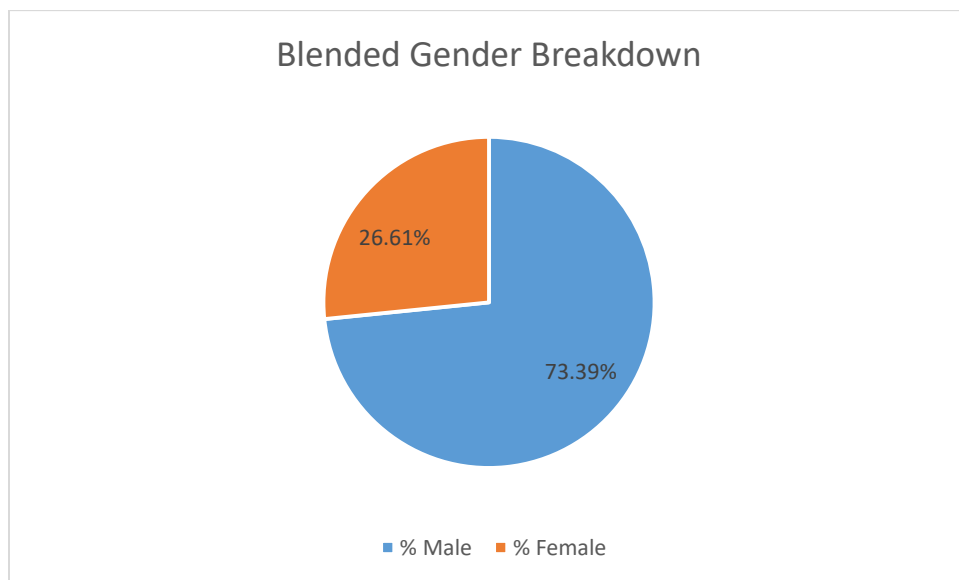


Figure 6 - % Gender Breakdown within Blended Program Area (DMIT General)

At a high level, there are substantially more students responding to the Institutional Research survey that have graduated from Technical and blended DMIT programs of study. There are slightly more male students represented in the Business Analysis discipline (Business), with slightly more females represented in Creative program area graduates.

### Program Area Analysis of Registrar Data

The following observations were made relating to the data in Table 3:

1. The average age of an Animation student is much greater (29) than the program average (24.5), and the average ages within the IDM segmentations within Table 4, with the highest average age being within the Blended (DMIT General) program in terms of female students (27.2). Animation is considered a Creative skill set within the IDM segmentation, as outlined in Table 4.
2. The most normal distribution (skewness and kurtosis near zero) of student age appears within the Visual Communications program area. Also, it represents the most significant percentage of female students in all programs within the data set (67.74%). Visual Communications is considered a Creative skill set within the IDM segmentation, as outlined in Table 4.
3. The only program area representing a nearly equal number of male and female students (52.63% female) is the Television program. Following Visual Communications from the previous observation, it is the second and only other program area with more female students (67.74%) than male students. Television is also considered a Creative skill set within the IDM segmentation, as outlined in Table 4.
4. The most significant disparity in terms of gender imbalance can be found within the Game Programming program, with 97.44% of the students being male (only a single female student registered in the program over the five years of data provided). Game Programming is considered a Technical skill set within the IDM segmentation, as outlined in Table 4.

5. The second most significant disparity in terms of gender imbalance can be found within the Systems Administration program, with 81.48% of the population being male. Systems Administration is considered a Technical skill set within the IDM segmentation, as outlined in Table 4.
6. The third and fourth most significant disparity in terms of gender imbalance was found within the Game Design (76.36% male) and Application Development (76.09% male) program areas. Game Design is considered a Creative skill set; Application Development is considered a Technical skill set within the IDM segmentation, as outlined in Table 4.



**ANALYSIS OF THE NAIT INSTITUTIONAL RESEARCH DATA**

More analysis work was required within the Institutional Research Data compared to the effort put into the Registrar's data (Table 6 and Table 7). The following high-level analysis is being provided to start the discussions on gender, reported salary, and program of study details. Of note, one significant data comparison that interested the researcher was the individual program areas contained within the Digital Media and IT program area. Unfortunately, the survey instrument was not designed to capture area of specialization data in granular form like the Registrar's data set, it was designed to represent graduate students from within the Digital Media and IT program without specializations. As such, a lower-level analysis and program-by-program comparison exercise could not be completed within this study.

<b>Program of Study</b>	<b>Emphasis</b>	<b>Male Responses</b>	<b>Female Responses</b>	<b>% No Response / Prefer Not to Answer</b>	<b>Average Salary</b>	<b>Salary Skewness</b>	<b>Salary Kurtosis</b>
Digital Media and IT	Digital Media and IT	66.25%	31.51%	2.23%	\$40,011.08	1.92	12.77
Graphic Communications	Graphic Communications	32.88%	65.75%	1.37%	\$33,682.13	1.88	6.06
Photographic Technology	Photographic Technology	24.49%	73.47%	2.04%	\$29,286.57	1.11	1.23
Radio and Television	Radio	62.50%	34.38%	1.56%	\$32,039.56	1.94	8.30
Radio and Television	Television	59.09%	40.91%	1.52%	\$36,092.96	1.74	4.38
<b>Blended Program Data</b>		58.23%	39.63%	2.13%	\$37,319.15	1.91	11.22

Table 6 – Institutional Research Data, Gender and Salary Details

<b>Program of Study</b>	<b>Emphasis</b>	<b>Male Responses</b>	<b>Female Responses</b>	<b>Salary Delta from Blended Program Data</b>	<b>Salary % Delta from Blended Program Data</b>
Digital Media and IT	Digital Media and IT	8.02%	-8.12%	\$2,691.93	7%
Graphic Communications	Graphic Communications	-25.35%	26.12%	-\$3,637.02	-10%
Photographic Technology	Photographic Technology	-33.74%	33.84%	-\$8,032.58	-22%
Radio and Television	Radio	4.27%	-5.26%	-\$5,279.59	-14%
Radio and Television	Television	0.86%	1.27%	-\$1,226.19	-3%

Table 7 – Comparative Data from Table 6

### High-Level Observations of the Institutional Research Data

Noting that this data set represents information volunteered by students who have graduated from the programs analyzed within this study, general high-level observations of the data in Tables 6 and 7 are:

1. There are slightly more Males than Females that responded to the survey to include a binary gender identification (58.23% Male vs. 39.63% Female) with a 2.13% no response or prefer not to answer response. These percentages closely mirrors the gender mix in these programs from the Registrar's Office data in Table 3 (59.33% Male vs. 40.67% Female).
2. There were significantly fewer Male responses from Graphic Communications and Photographic Technology program graduates compared to the Blended Program responses (-25.35% and -33.74%); conversely, there were significantly more Female responses (26.12% and 33.84%) in these program areas.

### Observations Linking Available Data Sets

Gender is the only common element that connects the two data sets. As mentioned earlier in this Chapter, the Registrar data is trusted information regarding gender verification at the time of program enrolment (in terms of binary gender classification on government records of this vintage). Within the Registrar's data set, 1453 individual student records covered five years of student registrations. Within the Institutional Research data, 656 individual responses were obtained from the graduate student survey over the same five-year period.

These records represent just under one student response for every two students in the program during the five years of data analyzed in this study (~50%).

### Registrar Data vs. Institutional Research Data Gender Comparison

Both data sets were processed to provide high-level gender split percentages, and the binary gender complexions of these two data sets are similar.

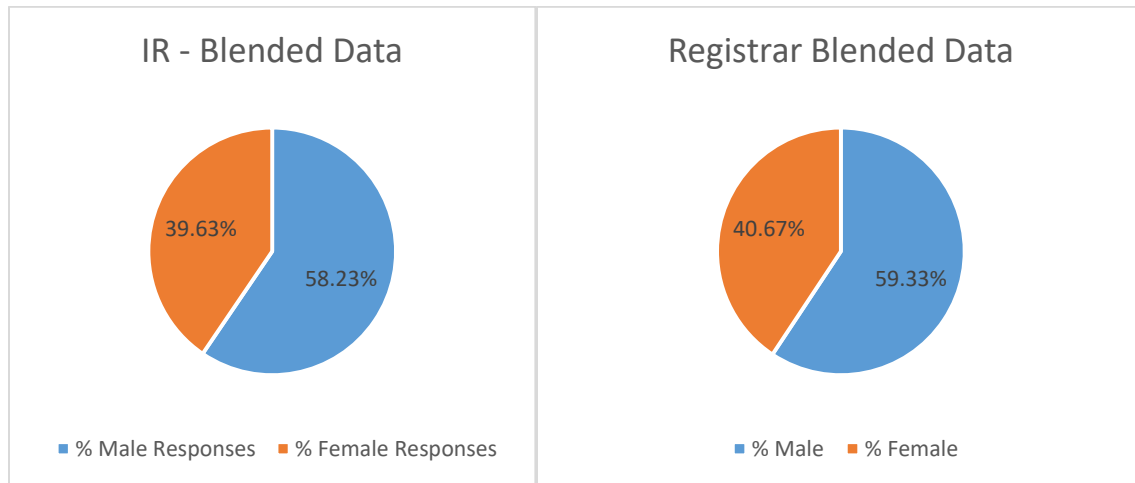


Figure 7 – % of Graduate Responses vs. Registrants by Gender (Total Data)

Following this observation of the similarity of the gender ratios between the two data sets, the following program-level comparisons are available to the researcher.

### Gender Comparison of Digital Media Data Sets

Both data sets were processed to provide high-level gender split percentages within the Digital Media and IT Program area, and the binary gender complexions of these two data sets are almost identical.

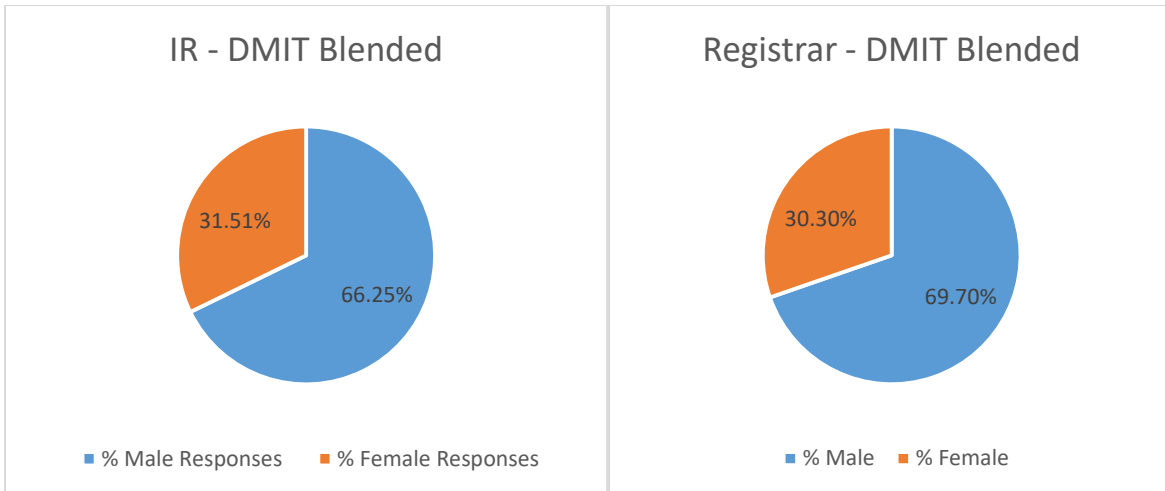


Figure 8 – % of Graduate Responses vs. Registrants by Gender (DMIT)

#### Gender Comparison of Graphic Communications Data Sets

Both data sets were processed to provide high-level gender split percentages within the Graphic Communications Program area, and the binary gender complexions of these two data sets are remarkably similar.

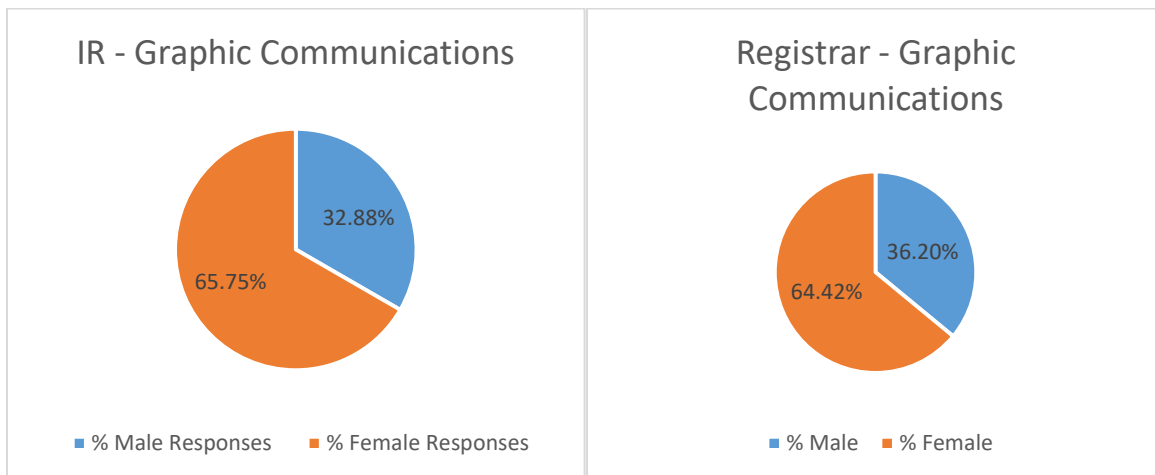


Figure 9 – % Graduate Responses vs. Registrants by Gender (Graphic Communications)

#### Gender Comparison of Photographic Technology Data Sets

Both data sets were processed to provide high-level gender split percentages within the Photographic Technology Program area, and the binary gender complexions of these two data

sets present the second most significant difference in the percentage of female responses to the survey instrument over the registration data (7.37% higher in terms of percentages).

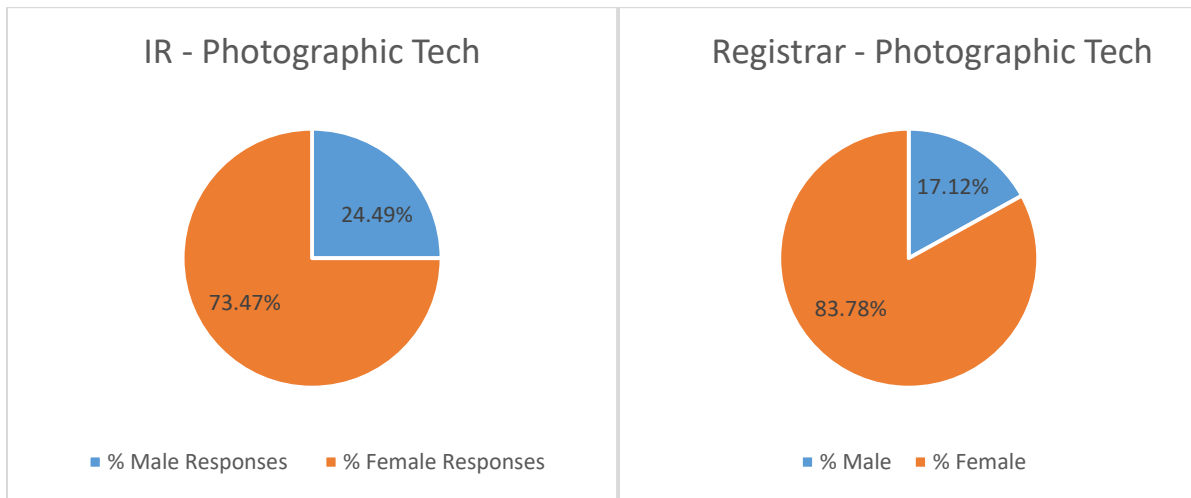


Figure 10 – % of Graduate Responses vs. Registrants by Gender (Photo Tech)

Gender Comparison of Radio Data Sets

Both data sets were processed to provide high-level gender split percentages within the Radio Program area, and the binary gender complexions of these two data sets are returning to the pattern of being remarkably similar to other program areas.

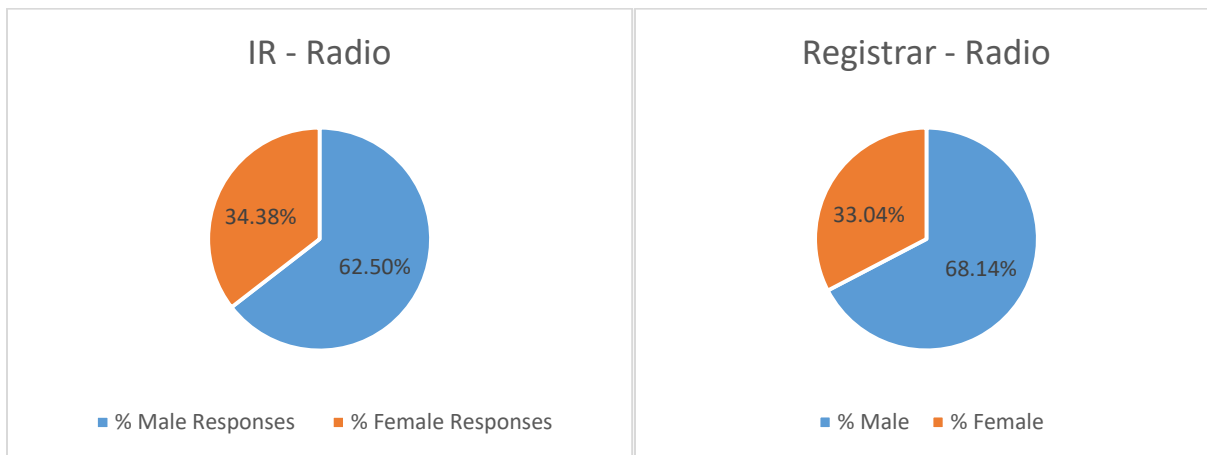


Figure 11 – % of Graduate Responses vs. Registrants by Gender (Radio)

### Gender Comparison of Television Data Sets

Both data sets were processed to provide high-level gender split percentages within the Television Program area. The binary gender complexions of these two data sets present the most significant difference in the percentage of female responses to the survey instrument over the registration data (11.72% higher in terms of percentages) when compared to the other data sets.

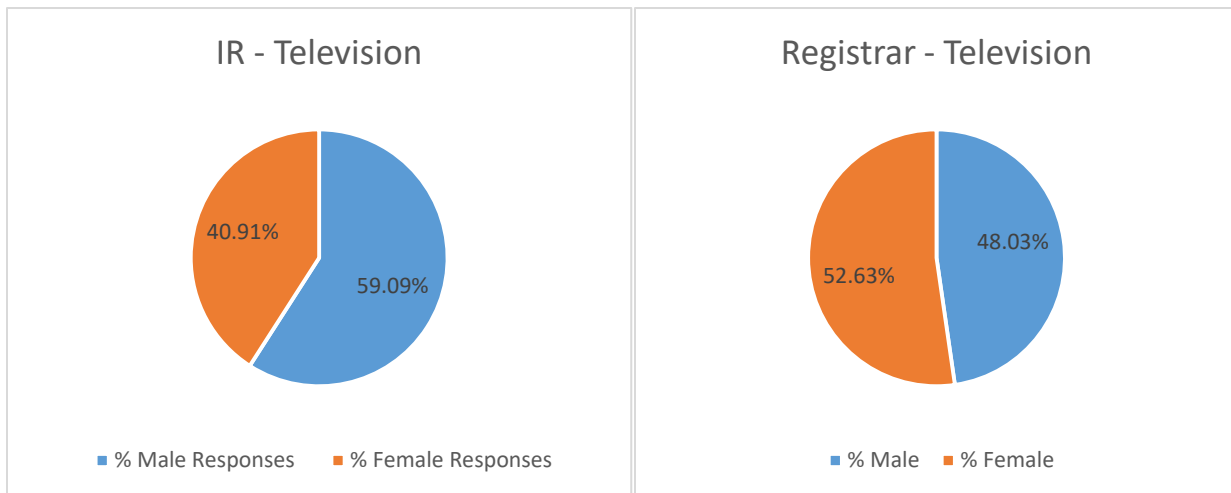


Figure 12 – % of Graduate Responses vs. Registrants by Gender (Television)

### Observations on Similarities in Gender Representation Across Data Sets

From this analysis, a comparison between the Registrar and Institutional Research data indicates curious similarities in terms of gender percentages in each program area. It could be said that the Institutional Research data set is a substantially similar and representative sample of each program of study over the five years of data provided, making them similar in terms of gender complexion.

### Observations Regarding Employment Relatedness and Program of Study

Each graduation program was segmented to provide a breakdown of the number of responses, gender, and percentage of responses within each of the three classifications of relatedness. The following bar charts are provided to demonstrate these responses in visual form.

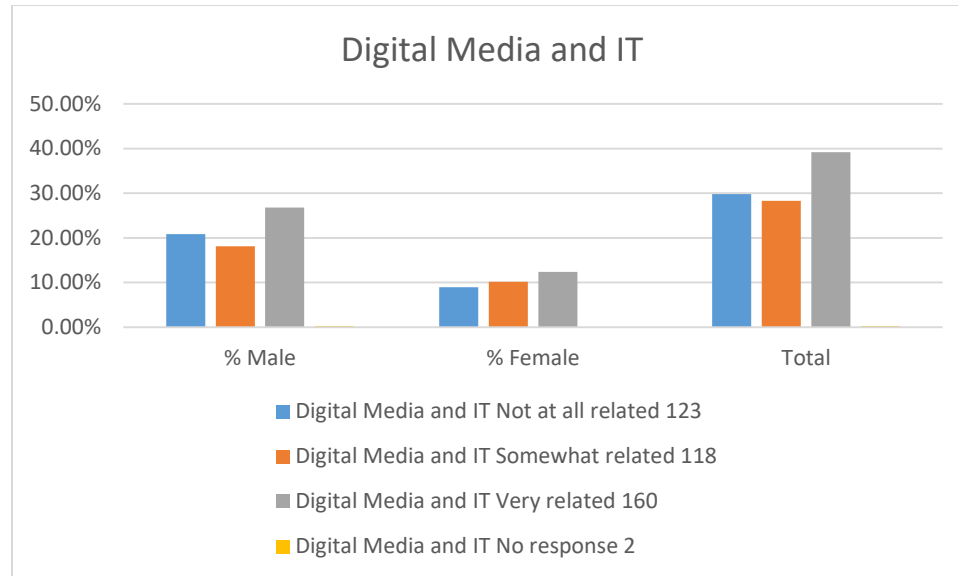


Figure 13 – % Digital Media and IT, Gender and Program Relatedness to Employment

Regarding employment, respondents who graduated from the Digital Media and IT program felt their employment is very related to their program of study, followed closely by those who feel that their employment is not at all related to their program of study (Figure 13). Those who feel their employment is somewhat related are almost equal to those who feel their employment is unrelated to their program of study. Combining relatedness, 67.5% of the graduates felt their employment was very related or somewhat related to their program of study. Only 29.87% felt their employment was not at all related (Figure 13). Regarding gender, both male and female populations responded that their employment was very much related to their program of study.



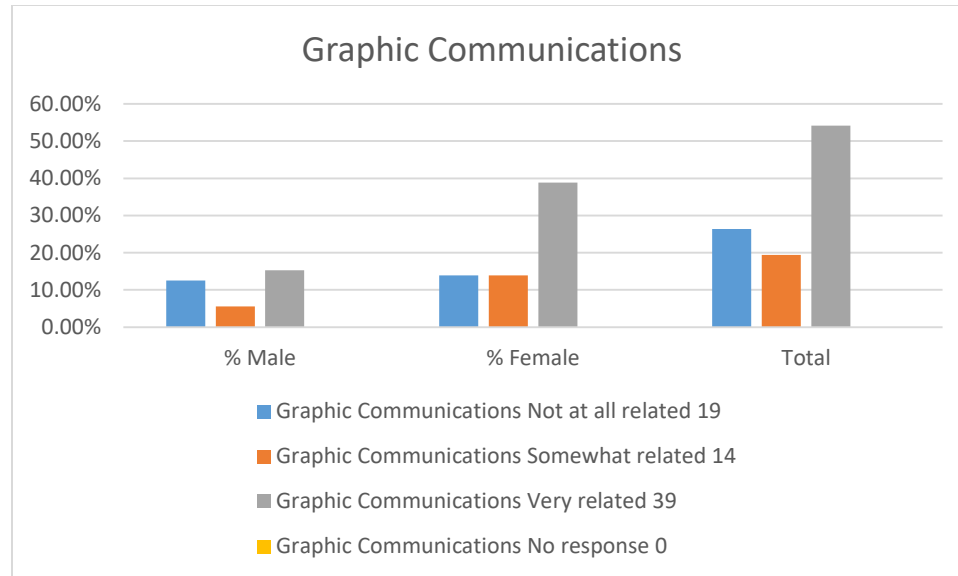


Figure 14 – % Graphic Communications, Gender, Program Relatedness to Employment

Graphic Communications graduates feel their employment is very much related or somewhat related to their program of study; this holds for both male and female students, with 73.61% positive responses compared to 26.39% indicating otherwise (Figure 14). A larger percentage of female students perceived their work as very related to their program of study, 23.61% more than males. A generalized statement could be made that females found or identify their work as more suited to their program of study in Graphic Communications.

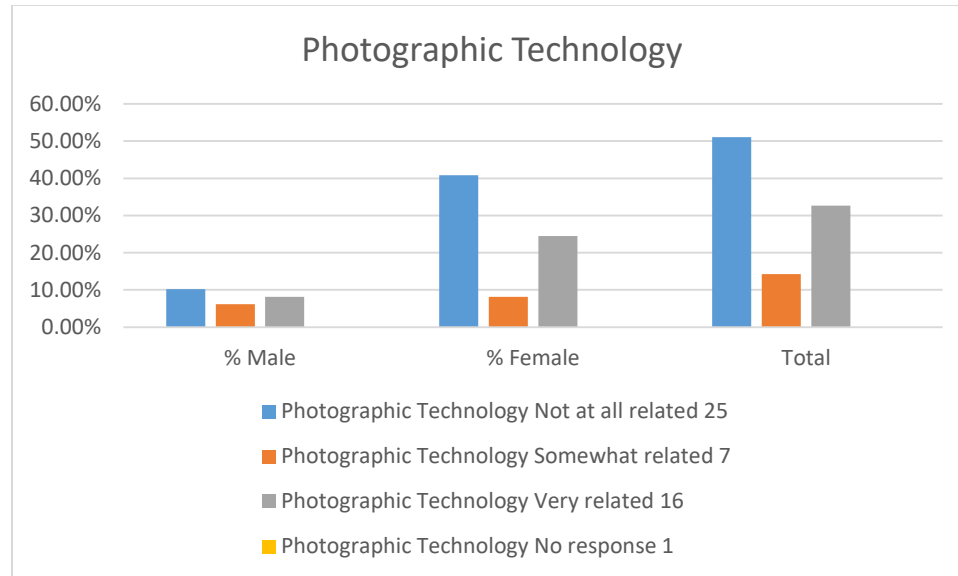


Figure 15 – % Photographic Technology, Gender, Program Relatedness to Employment

Photographic Technology graduates generally feel their employment is not at all related to their program of study (51.02%), skewed by a large percentage of females reporting this compared to males (30.61% higher for females) (Figure 15). A generalized statement could be made that females find their employment is much less related to their program of study in Photographic Technology than their male counterparts.

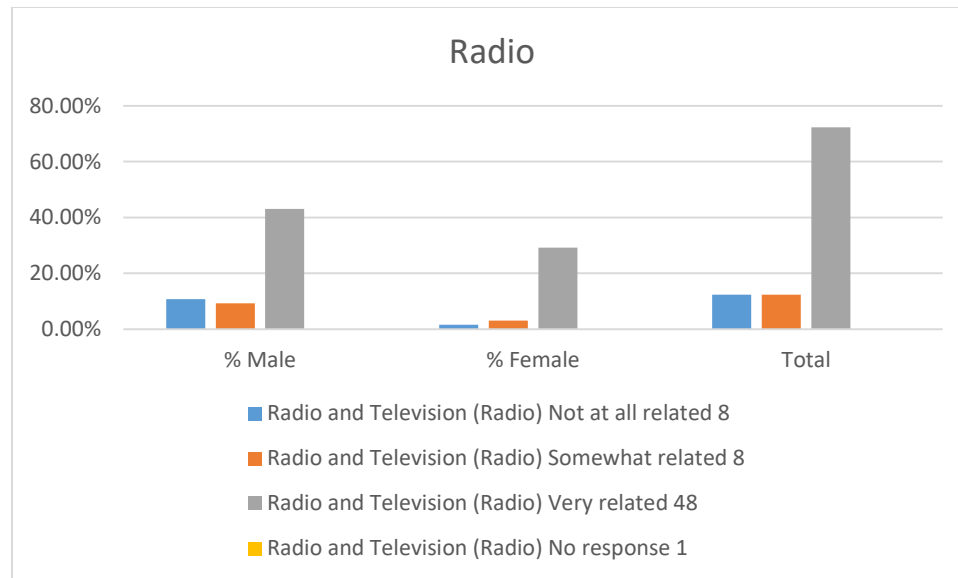


Figure 16 – % Radio, Gender and Program Relatedness to Employment

Radio graduates feel their employment is very much related to their program of study, with both male and female students indicating this. Further, 84.62% indicate their employment to be very related to their education or somewhat related to their field of study (Figure 16). Through this analysis of the data collected by the survey instrument, radio graduates appear to be the most satisfied regarding the link between their education and employment, more than any of the other programs analyzed within this study. A generalized statement could be made that both males and females find work related to their program of study after completing the Radio program.

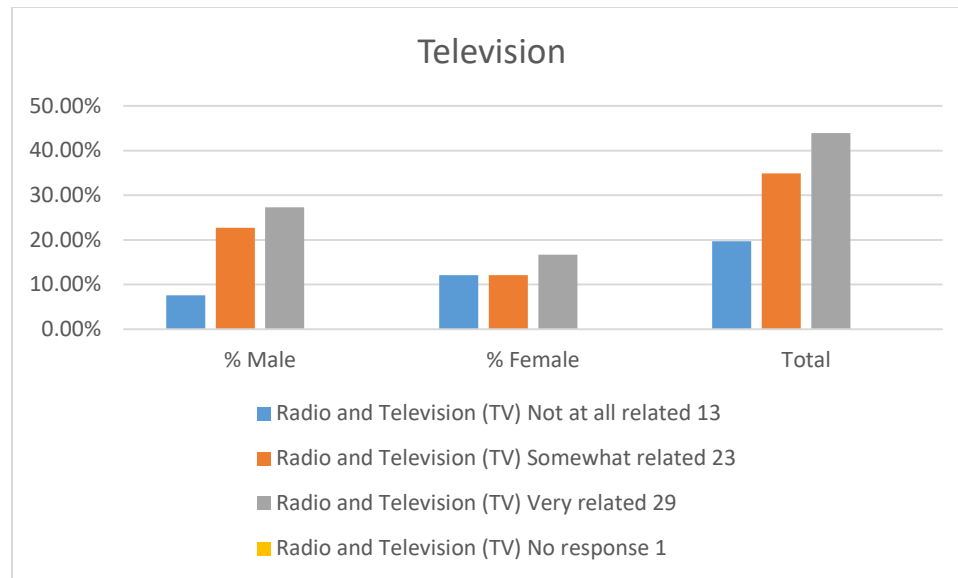


Figure 17 – % Television, Gender and Program Relatedness to Employment

Television graduates feel their employment is very much related or somewhat related to their program of study; this holds for both male and female students, with 43.94% indicating this relationship to be very related to their education and another 34.85% indicating their work is somewhat related to their field of study (78.79% total) (Figure 17). A generalized statement could be made that males and females find work related to their program of study after completing the Television program, although slightly less so than the Radio program.

#### Conclusions on Employment Relatedness and Program of Study

The programs analyzed appear to provide students with a pathway to employment that is very related or somewhat related to Digital Media and IT, Graphic Communications, Radio, and Television. Photographic Technology is the only program that does not appear to provide a pathway to employment-relatedness for both male and female respondents.

In terms of the gender splits across respondents, there were:

- Slightly fewer female respondents than males in the Digital Media and IT, Radio, and Television streams;
- Slightly more female respondents than males in the Graphic Communications stream, with the greatest percentage difference in gender responses favouring females in the Photographic Technology stream.

Why these gender differences existed is curious to the researcher but is outside the scope of this study.

#### Observations Regarding Program of Study and Average Salary

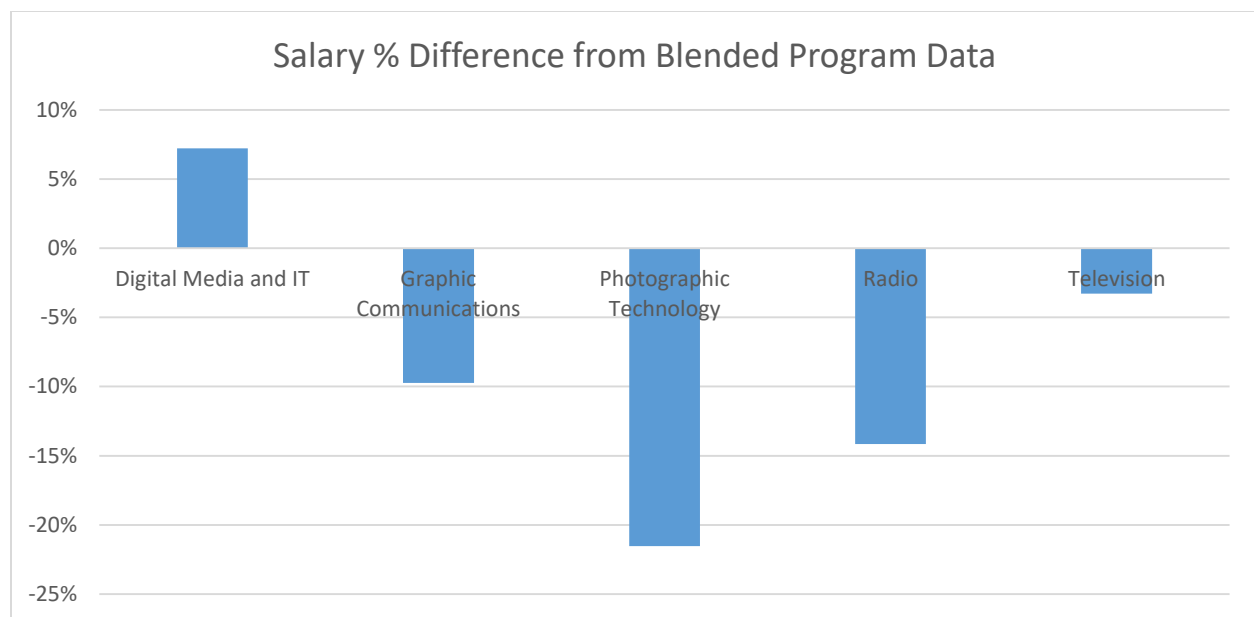


Figure 18 – % Salary Delta in Program Area vs Entire Data Set (Last Column of Table 7)

The analysis of reported salary and program of study resulted in the visualization in Figure 18. It suggests that Digital Media and IT program graduates get paid more (7%) than the rest of the graduate students in the programs represented within the Institutional Research responses. On average Radio and Photography students get paid less, 14% and 22% less than the respondents' average. It is important to note that the Digital Media and IT program represented a much larger population than the other programs (DMIT with 403 responses or 62.43% of all responses, compared with 254 responses from the remaining program areas), which may skew

the average data. Further research and analysis may need to be undertaken outside this study's scope.

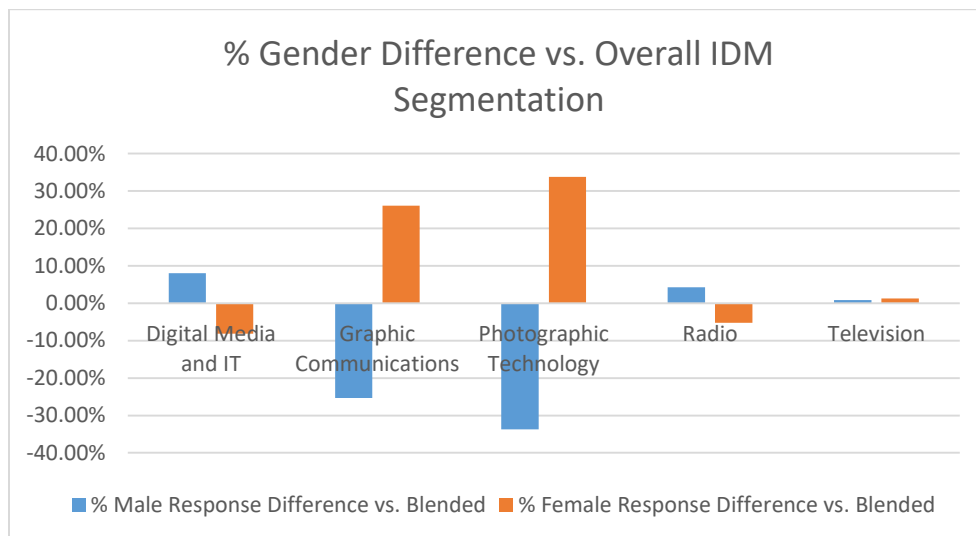


Figure 19 – % Gender Difference vs Entire Data Set (First Two Columns of Table 7)

No response / prefer not to answer responses creates issues in this visualization, but the image does provide some value to the research (Figure 19). The following observations were made from this analysis. The Television program data most closely represents the overall program data regarding gender, followed closely by the Radio program. Digital Media and IT are also somewhat similar in terms of gender complexion, and similar to Radio, it has a slightly greater male population than the entire data set. Graphic Communications and Photographic Technology have much higher differences in terms of gender mix compared to the entire data set. Graduates of these two programs appear to be skewed towards more female participants than males (26.12% and 33.84% more females, respectively).

#### Observations Regarding Program of Study, Gender, Employment Relatedness, and Salary

Within the Institutional Research survey instrument, graduates of each program provided binary gender identification, annual salary, and current employment relatedness to their program of graduation responses.

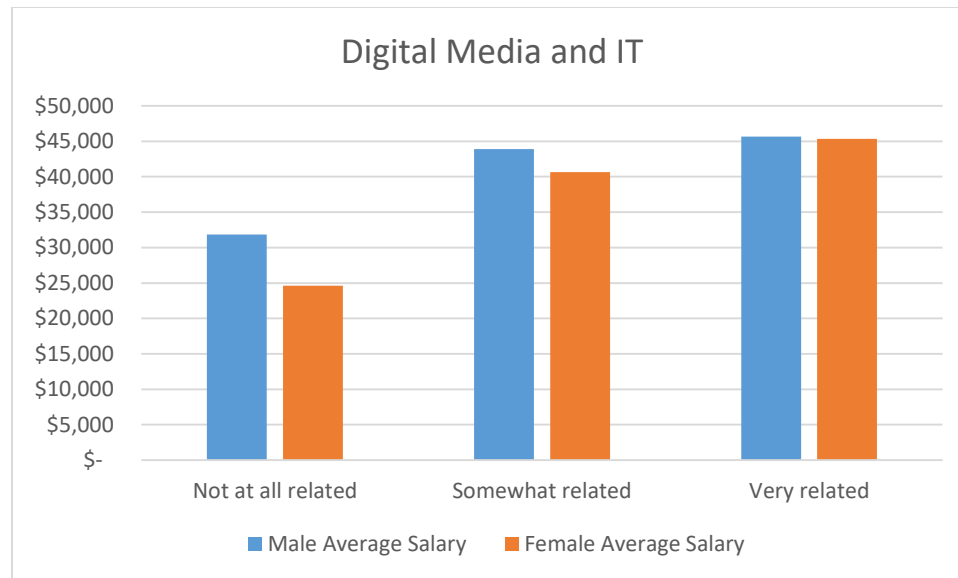


Figure 20 – DMIT Program, Gender, Salary, and Relatedness

Respondents from the Digital Media and IT program appear to make the most money when employed in a position that is very related to their program of study. They also appear to make slightly less money when employed in a somewhat related position and much less in a position unrelated to their program of study. Also of interest is the parity in pay between males and females when working in a very related position. The average reported salary for males is \$45,648; for females, \$45,350. Of note is that the average male salary is the highest across the programs, but this is not the case for female respondents; Radio and Television salaries appear to be the highest average across all the programs studied within this research work for females.

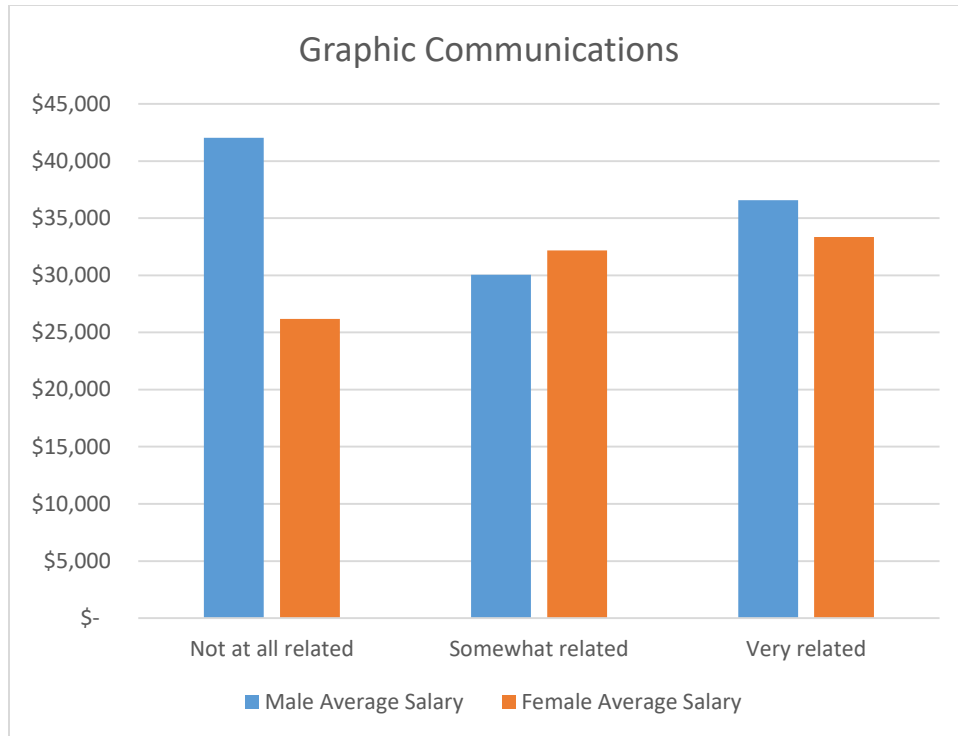


Figure 21 – Graphic Communications Program, Gender, Salary, and Relatedness

Male respondents from the Graphic Communications program appear to make the most money when employed in a position unrelated to their program of study (Figure 21). Female respondents appear to make the most money when working in a position that is very related to their program of study, but still less than their male counterparts in a very related position. Females also appear to make slightly less money when employed in a somewhat related position, but more than their male counterparts.





Figure 22 – Photographic Technology Program, Gender, Salary, and Relatedness

Male respondents make the most money working in somewhat related positions compared to unrelated or very related positions. By contrast, females make the least money in any program area studied when working in somewhat related positions (\$22,800). There appears to be a slight advantage to being a female working in a position very related to the program of study, similar to all other programs except Graphic Communications and the near parity of gender pay in the DMIT program data.

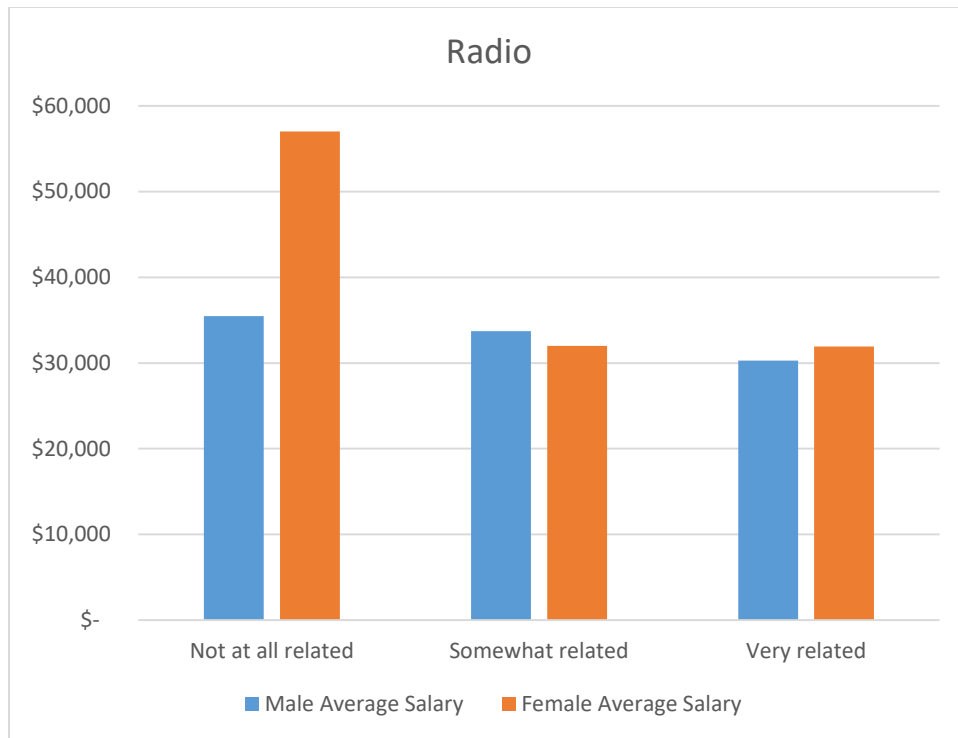


Figure 23 – Radio Program, Gender, Salary, and Relatedness

From Figure 23, it would appear that females graduating from the Radio program have the highest average salaries across all the programs studied. After reviewing the source data, the \$57,000 average was reported by a single respondent and should be considered a potential outlier in terms of this analysis. Noting this average is tied to a single response, an observation still appears valid in that Radio graduates make more money working outside of their field of study than when working in a related capacity, with relative wage parity across genders.



Figure 24 – Photographic Television Program, Gender, Salary, and Relatedness

Respondents from the Television program who indicate they are working in a somewhat related capacity appear to make more money than those in an unrelated or very related area, with females reporting an average of \$10,749 greater earnings than males (Figure 24). Gender wage parity appears close (\$544 greater annual average earnings for males) when working in an unrelated field, with females making slightly more in a very related position (\$2,285 annually).

The following table is provided for reference when comparing the average reported salaries to the approximate annual salary sourced from Statcan data as introduced in Chapter 2.

<b>Statcan Average</b>	<b>\$37,319.15</b>
------------------------	--------------------

<b>Program Area</b>	<b>Gender</b>	<b>Relatedness</b>	<b>Average Reported Salary</b>	<b>As Percent of Statcan Average (2018)</b>
Digital Media and IT	Male	Not at all Related	\$31,851.28	85.35%
Digital Media and IT	Female	Not at all Related	\$24,631.76	66.00%
Digital Media and IT	Male	Somewhat Related	\$43,888.00	117.60%
Digital Media and IT	Female	Somewhat Related	\$40,648.86	108.92%
Digital Media and IT	Male	Very Related	\$45,684.02	122.41%
Digital Media and IT	Female	Very Related	\$45,349.98	121.52%
Graphic Communications	Male	Not at all Related	\$42,031.43	112.63%
Graphic Communications	Female	Not at all Related	\$26,190.29	70.18%
Graphic Communications	Male	Somewhat Related	\$30,050.00	80.52%
Graphic Communications	Female	Somewhat Related	\$32,180.00	86.23%
Graphic Communications	Male	Very Related	\$37,866.67	101.47%
Graphic Communications	Female	Very Related	\$33,344.72	89.35%
Photographic Technology	Male	Not at all Related	\$28,785.71	77.13%
Photographic Technology	Female	Not at all Related	\$30,626.67	82.07%
Photographic Technology	Male	Somewhat Related	\$43,135.00	115.58%
Photographic Technology	Female	Somewhat Related	\$22,800.00	61.09%
Photographic Technology	Male	Very Related	\$26,800.00	71.81%
Photographic Technology	Female	Very Related	\$27,582.22	73.91%
Radio	Male	Not at all Related	\$35,463.67	95.03%
Radio	Female	Not at all Related	\$57,000.00	152.74%
Radio	Male	Somewhat Related	\$33,700.00	90.30%
Radio	Female	Somewhat Related	\$32,000.00	85.75%
Radio	Male	Very Related	\$30,287.50	81.16%
Radio	Female	Very Related	\$31,930.32	85.56%
Television	Male	Not at all Related	\$31,707.50	84.96%
Television	Female	Not at all Related	\$31,164.00	83.51%
Television	Male	Somewhat Related	\$37,716.67	101.07%
Television	Female	Somewhat Related	\$47,564.57	127.45%
Television	Male	Very Related	\$33,610.33	90.06%
Television	Female	Very Related	\$35,895.36	96.18%

Table 8 – Program, Gender, Relatedness, Reported Salary and % of Statcan Average

Table 8 shows that female graduates of the Digital Media and IT and Graphic Communications programs employed in positions unrelated to their program of study earn substantially less than the Statcan average at 66% and 70% respectively.

Table 8 also shows that female graduates of the Photographic Technology program employed in positions somewhat similar to their program of study earn substantially less than the Statcan average at 61%. Only slightly improving within the Photographic Technology program, graduates working in a field very related to their program of study regardless of gender, earn less than 75% of the Statcan average (71.8% for males, 73.9% for females).

All other programs, genders and reported employment relatedness to the program of study responses indicate a greater than 75% earnings ratio compared to the Statcan average. The next lowest ratio is 77.1% for male graduates of the Photographic Technology program working in a position unrelated to their program of study. Graduates of the Digital Media and IT program working in somewhat related to very related program areas earn more than the Statcan average, regardless of gender. However, there are suggestions males earn more than females. Males working in unrelated or very related positions from the Graphic Communications program earn substantially more than their female counterparts. The same applies to males from the Photographic Technology program working in somewhat related areas. Females earn more than their male counterparts in seven segmentations presented in Table 8, with the most significant difference in wages being reported by a single female responder from the Radio program working in an unrelated field at 152.7% of the Statcan average. It is important to note that there are 15 segmentations within Table 8 of Chapter 4, which indicates that 46.67% of the segments representing females indicate salary imbalances relating to gender for graduates entering the

IDM Industry in the local area. In other words, 53.33% of the categories in Table 8 suggest that males make more money per year than females graduating from similar program areas.

#### Observations at the Convergence of Both Data Sets

Extracted from Table 3 and Table 6, gender complexion within the Registrar's Office student data and the Institutional Research responses are substantially similar, as demonstrated in the following figure.

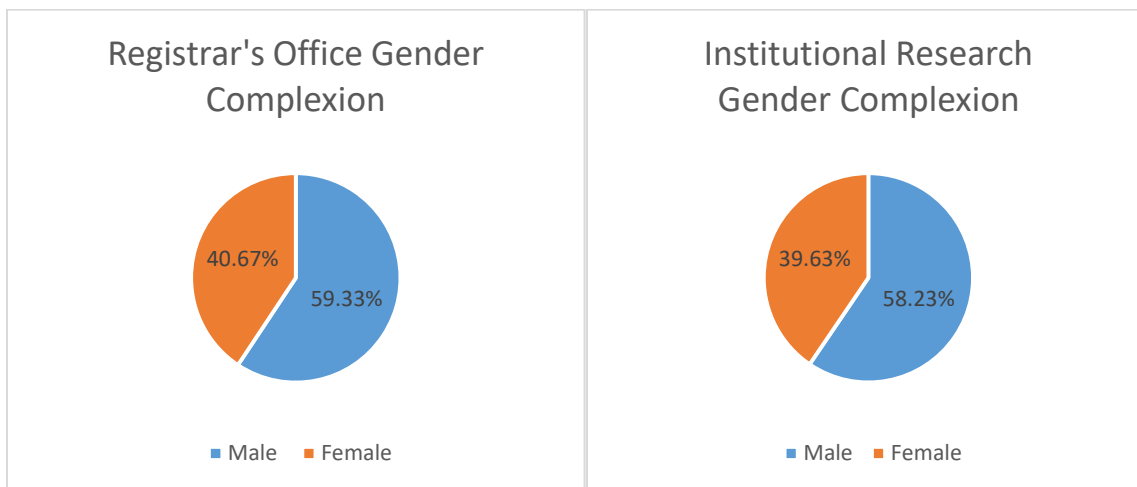


Figure 25 – Data Set Gender Complexion Comparison

Extracted from Table 5 and the data set from Institutional Research, a comparison of program segmentation utilizing the taxonomy developed in Chapter 2 was made to uncover differences between the two data sets regarding Blended, Business, Technical and Creative disciplines, as demonstrated in the following figure.

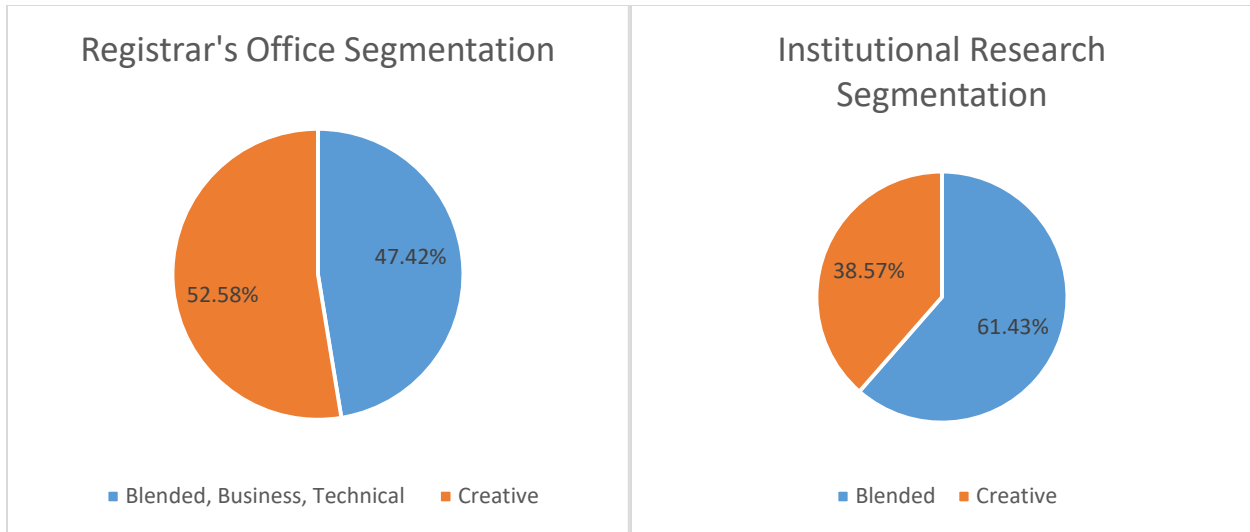


Figure 26 – Data Set Taxonomy Comparison

Because the Institutional Research data did not provide further segmentation in terms of the Digital Media and IT disciplines, the only direct comparison that could be made is provided in Figure 26. Blended program data needed to be included with the Business and Technical program student counts to generate a more direct comparison between the two data sets. It is safe to say from Figure 25 and Figure 26 that, while gender similarities exist across the data sets, the potential comparison of the complexion of the students in terms of the taxonomy developed is not possible.

## **CHAPTER FIVE – CONCLUSION**

### [Addressing the Secondary Objective](#)

The secondary objective of this study was to provide a foundational framework for understanding the global Cultural and

Creative Industries landscape and the Interactive Digital Media (IDM) Industries within a Canadian context. Understanding the composition of the Creative and Interactive Digital Media Industries was necessary to understand the taxonomy required to support the analysis and conclusions contained within Chapter 5. This objective was achieved through the analysis of academic and industry publications in Chapter 2.

### [Addressing the Primary Objective.](#)

The primary objective of this study was to better understand the composition and effect of educational program streams on students within NAIT's Department of Media Innovation and Communication Technologies from 2012 to 2017.

As part of this primary objective, this study includes findings in Chapter 4 relating to student opportunities and inequities in terms of employment opportunity, gender, and age and compares and contrasts these to findings within the literature review in Chapter 2.

This Chapter is dedicated to achieving the Primary Objective of this study.



## Conclusions from the Literature Review

The findings of the literature review in Chapter 2 demonstrated that the following inequalities can be expected for those working within the Creative Industries:

- **Ageism** is present (Brodmerkel & Barker, 2019; Campbell, 2020);
- Issues relating to **gender and sexism** are prevalent (Brook et al., 2021; Dent, 2020; Duffy, 2016; Milestone, 2016; O'Brien et al., 2016; Oakley & O'Brien, 2016; Wang et al., 2013);
- **Gender imbalances exist** globally (Brodmerkel & Barker, 2019) and are present in Canada. (Campbell, 2020);
- Within a Canadian context (Campbell, 2020) those working in the Creative Industries:
  - With irregular employment patterns earn an annual wage of approximately \$11,000;
  - With regular employment outside of their field of study earn an annual wage of \$23,000;
  - **With regular employment** in their field of study earn an annual wage of **\$37,000**.
- Canadian employment market data from 2018 (Statcan, n.d.-b) provides an **income approximation for a worker within the Creative Industries to be \$33,550.00**.
- In terms of job stability and economic rewards, the 2011 UK study (Comunian et al., 2011) suggested the following relative to opportunities within the Creative Industries:
  - The best job stability and economic rewards could be found in advertising, architecture, writing, and publishing;
  - The most job uncertainty and lower economic benefits could be found in performing arts, film and TV, fine arts, and crafts.

### Conclusions from the Registrar's Office Data

**Regarding age differences**, the average age of a student in the Animation program is approximately four and a half years higher (29 vs. 24.5) than the average of all students in the data. The next significant average age difference is in the Application Development program, with a difference of less than two years (26.3 vs 24.5).

The relatively 'normal' age distribution, as described by the skewness and kurtosis values of the Visual Communications program, compared to the wide variances in distributions presented within the remaining programs is a curiosity, and may be worthy of additional consideration outside of this study.

Regarding IDM segmentation, the average age of a student within the creative programs tends to be lower (23.7) than the average age across all programs (27.2).

**Regarding gender differences, close to 60% of the students entering programs in this area are male, with more than 40% of the students are female, suggesting a slight male bias in these programs.**

Further analysis suggests that the more technical the program, the fewer female students the program will have, as demonstrated in Table 3 of Chapter 4; Game Programming, Systems Administration, Game Design, Application Development and Computer Software Development represent the top five highest male populations by percentage, exceeding 70%. The general stream for the Digital Media and IT program also follows this trend, with 73% of students being male. Web Design and Development also follows this trend with a male majority at 62.83%.

The understanding that the more technical the program, the fewer female students the program will have also follows the findings of the IDM segmentation in Table 5 of Chapter 4. Following, the gender differences in the creative programs are curious. More than 60% of the

students in the Animation and Radio programs are male, which does not align with the findings in Table 5 of Chapter 4, where Creative programs tend to have more female students. Further analysis of the reasons behind this would be worth additional analysis outside this study.

The remaining creative programs follow the data presented in Table 5 of Chapter 4. Students within creative programs tend to be female, with **Photographic Technology representing the most significant gender difference in terms of females (83.78%) with Visual Communications (67.74%), Graphic Communications (64.42%), and Television (52.63%).**

In this study, Business Analysts within the Business discipline of the IDM segmentations appear to be more male-centric, with 67.74% of the students graduating from this specialization responding as males.

In summary, there is a higher percentage of males within the student data, and **there does exist a noticeable skew in gender representation in technical programs towards males, with females presenting as the majority of participants in creative programs. The exception to this is the Animation and Radio programs, where males are a more representative population, with the largest gender disparity existing in the game programming stream at more than 97% of the population, with only one female student presenting within five years of student data.**

#### Conclusions from the Institutional Research Data

Based on reported annual salary data, the blended program data average indicates a Creative Industries graduate can earn an average of approximately \$37,319.15 for the year immediately following the student data (Statcan, n.d.-a), noting this is a single historical data

point based on blended data collected from several different years across the entire country with no age, experience, education or location details associated with it.

Within each program, the average reported annual salary data indicates the Digital Media and IT program is the highest at \$40,011.08, with Television trailing this at \$36,092.96, just below the blended average. Graphic Communications (\$33,682.13) and Radio (\$32,039.56) are in third and fourth positions.

**Graduates of the Digital Media and IT program working in somewhat related to very related program areas earn more than the Statcan average, regardless of gender.**

However, males still tend to earn more than their female counterparts (3% more across the program), and as you dig deeper into some of the program areas there are strong indications males can earn substantially more than females. The Graphic Communications program is one example of this. The same applies to males from the Photographic Technology program working in somewhat related areas. Females earn more than their male counterparts in seven segmentations presented in Table 8 of Chapter 4.

**Photographic Technology average earnings reside in last place at \$29,286.57, a \$10,724.51 difference or 26.8% less when compared to those responding within Digital Media and IT. Adding to this, the Photographic Technology program represents the most significant gender difference in terms of females (83.78%) within the Registrar's data.**

Table 8 in Chapter 4 shows that female graduates of the Digital Media and IT and Graphic Communications programs employed in positions unrelated to their program of study earn substantially less than the Statcan average at 66% and 70%, respectively. Table 8 in Chapter 4 also shows that **female graduates of the Photographic Technology program employed in positions somewhat similar to their program of study earn substantially less than the**

**Statcan average at 61% of the National benchmark. Only slightly improving within the Photographic Technology program, graduates working in a field very related to their program of study regardless of gender, earn less than 75% of the Statcan average (71.8% for males, 73.9% for females).**

**By way of reminder for comparison, all other programs, genders, and reported employment relatedness to the program of study responses indicate a greater than 75% earnings ratio compared to the Statcan average.**

### Conclusions Comparing Literature Review to Data Analysis

#### Age-Related

While no direct comparisons between the literature and student data analyzed can be made in terms of age, it is apparent that age can be a factor within industrial segments (Bridgstock, 2011; Brodmerkel & Barker, 2019; Conor et al., 2015; Hennekam, 2015) and in the complexion of NAIT students entering different programs. No other conclusions can be made between the literature and the student data.

#### Gender-Related

While the literature demonstrated different perspectives on gender inequality and sexism, there can be no conclusive ties made between the literature and the student data analyzed within this study. There does, however, exist similar themes in terms of gender participation within different segments of student data, more males are present in student registrations as well as in graduate student responses (being roughly a 60/40 split across both data sets). **Student program complexion and those recently entering the industry in this field are generally more male than female, with some exceptions. The exceptions are some creative disciplines, but not all, being comprised of a greater percentage of female than males. The largest percentage of**

**females within a creative program were within the Photographic Technology Program, at approximately 84% within the Registrar's data.**

#### Salary Related

Overall, graduates from the more technical student population have reported full-time annual salaries that closely approximate the expected Statcan earnings for a worker in the Creative Industries. Generally, this population tends to be male.

Students in creative programs tend to earn less than the expected Statcan average, with Photographic Technology practitioners earning approximately 27% less than the national norm, a program area that is largely represented by female graduates.

#### Salary and Gender-Related

At the highest level, the Institutional Research data indicates a small imbalance in favour of male salaries over their female counterparts, as demonstrated in Table 8 of Chapter 4, with **53.33% of the categories in Table 8 suggesting that males make more money per year than females graduating from similar program areas.**

In terms of annual salary, generally speaking, female graduates from creative programs who report working in positions unrelated to their field of study appear to represent the most significant disparity in pay when compared to the national average, which is hinted at in some sectors of the Creative Industries literature. This is not always the case with NAIT student graduates, as found within the Graphic Communications program detail from Institutional Research.

### Reasoning the Why from this Study

This study does not have any mechanisms to conclusively deliver a response as to why there are age, gender, or salary inequities in the different program areas, but would suggest that the why could relate to one, many, or all of the following factors:

1. Regional Economic Growth and Developmental History (Milestone, 2016);
2. Class (Conor et al., 2015; Dent, 2020; Duffy, 2016; Wang et al., 2013);
3. The romance of entrepreneurship and ‘art for art’s sake’ (Duffy, 2016)
4. Normal representative gender gaps in STEM fields in similar cultural regions (Makarova et al., 2019; Wang et al., 2015);
5. Cultural elements that play into regional segregation of genders (Campbell, 2020; Dent, 2020; Duffy, 2016);

There are some obvious findings that could be considered stereotypical, but are supported by the literature review. Technical programs and career pathways tend to favour male populations, where males earn more.

Surprisingly to the researchers, these biases or stereotypes do not necessarily hold true for the creative programs and occupations, as the literature appears to provide some points of contrast in terms of the analysis of the data within this study. Unsurprisingly to the researcher, there are some relatively strong inequalities in terms of reported earnings from females in specific creative programs, where it appears there is a further layer of underemployment present in the students graduating from these program areas.

It is almost certain that the history of a regions economic development plays a substantial component to the similarities between, and differences from, the findings of this specific study.

Compressing

### Discussion - Implications for Students

Students interested in post-secondary education could consider this study as a potential reference guide in terms of selecting a career path, but it is important to note that this study only

covered five years of student data from a single program area within an Alberta-based post-secondary program. It is not representative of student opportunities, current imbalances and behaviours, as well as current cultural and market conditions, and it does not provide for additional longitudinal research to reference this study against.

#### Discussion - Implications for Industry

Socially responsible Creative Industries organizations could consider this study as a reference to better understand imbalances that may be present within the local human geography in terms of ageism, imbalances in gender representation, sexism, remuneration, and underemployment identified within this study.

Further, industry associations can directly address some of these issues through educational content, seminars, and programs built to continue to improve opportunities for employees and employers.

The research contained within this microanalysis of one set of academic programs within a single post-secondary institution can provide some insights to address these inequities. Celebrating these inequities in this sector can be amplified by the very sector in which they exist, which can also be tied to the public purse.

#### Discussion - Implications for Government

As the literature review concluded, it was noted that government publications, policies, and programs often define the Creative Industry, or the Interactive Digital Media Industry in a Canadian context. These government activities are often attached to funding (tax credits, student programs, research and development assistance, etc.) or services like trade missions. Based on the findings of this study, there are disparities and inequities present, and as there are tax dollars associated with government funding and programs, it could be argued that the public sector is



funding dysfunction within these economic areas. Further, they felt that Industry Associations were not dealing with these known issues as government funding that underpinned their existence could be put at risk. Governments need to be aware that when funding is applied to this 'economic' area, it can often direct inequality in business activities and extinguish potential reforms to bad practices. Funding and programmatic supports often reward bad behaviours.

### Discussion - Implications for Theory

In terms of understanding the Creative Industry or Interactive Digital Media Industry, the researcher believes a model of the key disciplines that go into this space has been provided. While most governments and industry associations offer lists of disciplines or key business activities as a mechanism to help define the industry in terms of binary counts associated to these, the researcher has offered a graphical mechanism to help approximate what skills or business activities might be in a location based environment to help qualify and quantify the sector.

### Suggestions for Future Research

This study provides a foundation for additional research, whether for further longitudinal studies at NAIT in this area, additional analysis in comparative studies in other post-secondary institutions locally or globally, or more in-depth analysis of specific student opportunities within this discipline.

As NAIT has transformed the Digital Media and IT Program within the School of Applied Sciences and Technology into The School of Media and Information Technology, the researcher would posit this is a positive outcome reflecting the importance of the educational programming delivered by this institution in this space. Longitudinal studies of the final years of student activities across the years 2018 to 2024 could be completed to provide a comparison of

those cohorts to the findings of this study, but also developed for comparative purposes for this new School. These longitudinal studies could include new non-binary student classifications, as well as the inclusion of new programs of studies that may be present, and potentially include data inputs from other post-secondary institutions. The closest of the five polytechnic institutions in Alberta that would be suggested by the researcher for comparison would be The Southern Alberta Institute of Technology (SAIT).

Additional expanded studies outside of the Polytechnics in the region could also be completed using this research as a reference.

#### [Suggestions for Improvement in the NAIT Data Sets](#)

At the macro level, NAIT's Office of Institutional Research did not segment the data provided by students who graduated from the Digital Media and IT program. As such, a fulsome analysis of the differences in technical, creative, and business disciplines was impossible.

Concerning gender analysis, the data sets provided by NAIT did not include non-binary gender identification attributes. It was noted that some of the respondents to the Institutional Research questionnaire did not provide a gender response. These non-responses could be based on individuals not wanting to disclose their gender identity because they did not have a non-binary gender response available or a simple data entry error by way of commission. Future data collection by the NAIT Registrar and NAIT's Office of Institutional Research may require these non-binary gender options, providing deeper research analysis regarding gender in future studies.

Some responses within the Institutional Research survey were left blank, while answers to other questions were provided, leaving gaps in the data sets. Non-responses included entries for gender, relatedness, and salary information by some participants. Where applicable, these

omissions were noted within the study, where salary averages omitted the blank data for reported yearly income.

### Suggestions for Improvements with Segmentation Based on Taxonomy

The researcher segmented program areas by perceived technical, creative, and business content levels within the analyzed program areas. These segmentations may require additional debate outside of this study in future works. The researcher attempted to conform to the segmentations provided within Chapter 2 from academic, industry, and governmental sources but understands the classification of each program area is mostly subjective without analyzing the core courses within each program in terms of program electives and available options.

### Issues Relating to the use of Statcan Data

While the Statcan data is included in Chapter 2 and again presented within Chapter 4 for comparison, it is essential to note that this has been provided as an approximation of a worker in the Creative Industries in 2018 for one calendar year only. Table 8 of Chapter 4 only uses this approximation for comparison purposes.

### Final Thoughts

Substantial structural, cultural and economic changes have occurred since the initial Research Proposal for this study was developed in 2017/18.

Socially and culturally, the global COVID pandemic has come and gone, impacting students and academic programs worldwide.

Further, changes to recognizing non-binary gender classifications have occurred, making additional longitudinal research on gender more complex.

*~fin~*

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## APPENDICES

### A.1 MBAC 6121 Research Proposal



WADE\_MURI\_Bound  
d\_Research\_Propose

### A.2 Research Subject Approval, CBU Shannon School of Business



ARP Approval.pdf

### A.3 TCPS2.0 Certificate



NSERC TCPS 2  
CORE Ethics Certific

### A.4 NAIT REB Review letter



NAIT REB  
Certificate.pdf

### A.5 CBU REB Review letter



1819105\_Approval\_  
Muri.pdf

### A.6 NAIT FOIP Approval



Fully Execued  
Agreement for Acce:

### A.7 NAIT IR Graduate Survey Template



NAIT IR Graduate  
Survey.pdf

## A.8 Primary Supervisor Ethics Approval



Primary Supervisor  
Ethics Approval.pdf