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Design of an Employability Agency for the
Transdisciplinary Students of Creative Technologies: A
Research through Design Approach

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A thesis submitted to Auckland University of Technology in partial
fulfilment of the requirements for the degree of Master of Creative
Technologies (MCT)

2020

Faculty of Design and Creative Technologies

Colab: Creative Technologies

Abstract

Fresh university graduates face an ever-changing professional landscape where it can be challenging to find jobs that lead to successful careers. This is particularly the case for emergent professions such as creative technologies, given the changing nature of technology and the increasingly recognised value of working across traditional disciplines. This thesis presents a Research through Design (RtD) project with the goal to help fresh creative technologists get better work opportunities. Semi-structured interviews were carried out with students, alumni, and industry experts to identify current practices, opportunities and challenges, and insights to inform the design of solutions to address this problem. Three themes were identified from these interviews: unexplored existing opportunities, a demand for employability skills, and platforms for student-industry interactions. The insights from this work inform the aspects that need to be addressed to design solutions that help creative technologies graduates find relevant jobs to start their careers in the right directions. The research raises new questions about why and how universities in the future can engage stakeholders to make the most of existing untapped opportunities and restructure processes to align with changing demands in industry.

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Attestation of Authorship

"I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning."

Name: Rajiv Rajusha

Date: 5th October 2020

Co-Authored Work

The chapter 2 of the thesis, the 'Manuscript' is a co-authored research paper titled "*Landing your first job in transdisciplinary Creative Technologies: A Research through Design approach*" submitted to the International Journal of Technology and Design Education.

This paper was jointly authored by Rajiv Rajusha, Ricardo Sosa and Amabel Hunting.

Rajiv Rajusha: I am the principal author of the paper and have written it under the supervision of my primary supervisor Dr Ricardo Sosa and my secondary supervisor Dr Amabel Hunting. My contribution to the paper is 80%. I prepared the initial manuscript, made revisions and coordinated changes with my supervisors. I am the corresponding author for the paper.

Sign: 

Date: 06 October 2020

Ricardo Sosa: Responsible for providing feedback on the structure of the paper, and edits on the content and writing of the paper. Assistance on identifying a target journal.

Sign: 

Date: 06 October 2020

Amabel Hunting: Responsible for feedback on methodology and providing feedback and edits on the content and writing of the paper.

Sign: 

Date: 7 October 2020

Acknowledgements

I would like to express my special appreciation to my supervisors Dr Ricardo Sosa and Dr Amabel Hunting for their continuous encouragement, guidance and unwavering support. They were a source of inspiration throughout the research. Discussions with them gave greater clarity and a deeper understanding of the context I wished to explore.

I would like to gratefully acknowledge the Auckland University of Technology Ethics Committee (AUTEC) for the Ethics approval (AUTEC Reference number 19/400, dated 14th November 2019).

My gratitude goes to Miguel, Colin, Li and Yutong from the Creative Technologies program. Our conversations in the lab were what kept me going all along. I would also like to thank all the participants for the interviews, who took time out of their busy schedules to be a part of the research.

Lastly, I would like to thank my family and friends for their loving support, encouragement and understanding.

Chapter 1: Establishing the field of knowledge

Introduction

Technologies are becoming integrated and more sophisticated. The fourth industrial revolution builds up on the digital technologies developed last century (Schwab, 2017). This revolution is characterised by the need for new applications and for the fusion of multiple technologies to solve increasingly complex problems (Li et al., 2017). This calls for advanced expertise from different domains to collaboratively create appropriate integrated solutions. With the pace at which it is bringing change, organizations as well as individuals need to proactively develop new ways in which products and services are produced and consumed (Prisecaru, 2016). Most occupations as we know them are expected to undergo fundamental transformations in the fourth industrial revolution. Some jobs will be threatened by redundancy, while others will grow rapidly. All jobs are likely to go through a process of change of the skillsets required to do them (World Economic Forum, 2016).

A new kind of jobs is required as part of this global transformation process. These new jobs require an understanding of multiple disciplines and strong collaborative capacities. This leads to the need for experts who are able to synthesise strengths and potentials from different domains. Such professionals are *transdisciplinary* in as much as their practice transcends conventional disciplinary boundaries. (Russell et al., 2008; Giri, 2002; Gibbons & Nowotny, 2001).

The field of 'Creative Technologies' aims to prepare graduates with such expertise (Connor et al., 2016). These professionals display skills and dispositions that go beyond traditional roles in well-established areas, such as Engineering or Design. Creative Technologies is normally considered a broad interdisciplinary and transdisciplinary domain (Connor, 2016). It refers to the integration of practices and knowledge from various disciplines ranging from Fine Art, Computer Science, Design, and Engineering (Connor, 2016). Graduate profiles of university programs in this area are typically oriented towards imaginative and entrepreneurial synthesis using digital technologies in new ways (Connor & Sosa, 2018). Creative Technologies has been positioned at the centre of a creative revolution (Zagalo & Branco, 2015).

In the last fifteen years due to the lack of a universally held definition, there has been a growth of degree programs that adopt the term 'Creative Technologies' but maintain their own distinct character. This makes unification of 'Creative Technologies' as a concept, very difficult. Typically, the common aspects among these programs are having a design orientation, emphasis on media technologies, and entrepreneurial approaches (Connor, 2020). In the short term,

however, recent graduates of Creative Technologies can find it challenging to find work opportunities where they can apply and continue to hone their unique skills. This research study seeks to inform a design-led project to help recent graduates of Creative Technologies in Auckland, New Zealand locate adequate employment after graduation. This research project originates from an identified need to prepare and connect these work-ready graduates to the local industry.

The research aims to cover a gap in employability related aspects of transdisciplinary graduates in an everchanging and technologically evolving environment. It studies these aspects for the Bachelor of Creative Technologies students at AUT, Auckland, New Zealand. The program for these students is so designed that they could have an understanding of multiple skills and domains while appreciating how these discrete disciplines work together in harmony, thereby setting them up as truly transdisciplinary. It investigates the perception that a large part of the industry that is working closely with the Creative Technologies community potentially could be under-utilizing these students and whether finding work opportunities that completely utilizes their skillsets in relevant domains will create a higher level of satisfaction among the students of the program. The research aims to identify how current BCT graduates' skills are being utilized and explores aspects that would help in creating better opportunities for these students. It analyses whether exposure to work environment would increase their confidence and chances of employability.

The research attempts to create value by trying to identify the right work opportunities for the corresponding skillsets of the students. It investigates the learning environment that would create a higher sense of satisfaction and therefore a smoother career progression for these students and graduates. The purpose is to figure out the platforms that would highlight the transdisciplinary skills of these students to the industry.

This research report follows AUT's 'Format Two – Manuscript Structure'. It is organised in three sections; the introduction, the journal manuscript and the conclusion chapter. The introduction chapter sets the backdrop for this research, explains what the research is about, and the methods employed to carry out the research. The next section is the manuscript which is in preparation for submission to a peer-reviewed journal (as per AUT's requirement). The manuscript could act as a standalone section. It introduces the research problem, discusses the research methods applied, the data collection and the thematic analysis. It then details the results of the research and the actionable insights for the design-led project. It ends with a discussion subsection. The closing Chapter that follows, builds on the results discussed in the

manuscript chapter. It builds upon the actionable design pathways discussed in the manuscript and draws connections to literature as well. It ends with reflection and conclusion subsections, which reflect on results and insights from the research and raise pertinent questions that the research work has highlighted.

Background

The research builds upon the research literature on employability (Tomlinson, 2017; Bui et al., 2019; Holmes, 2017; Tholen, 2015; Rothwell & Rothwell, 2017), future of work (Cook, 2008; Schwab, 2017; Manyika, 2017), the gig economy (Riggs et al., 2019; Abraham et al., 2017; De Stefano, 2015; Healy et al., 2017; de Ruyter et al., 2018) and work-integrated learning (Jackson, 2015; von Treuer et al., 2010; Billett, 2011; Ide & Thomas, 2011; Gamble et al., 2010; Wilton, 2012). These areas help to inform the project's goal to examine how different stakeholders look at employability in this area, and how the very nature of this type of work is changing in the local industries.

The "Gig Economy" refers to certain less structured, 'on demand' work arrangements and flexible jobs, primarily mediated through online platforms (Abraham et al., 2017). This is a phenomenon that has emerged out of the fourth industrial revolution. It has redefined how work is looked at and approached, especially on digital platforms. The rise of such internet-based services has led to the growth of non-formal work, outside the formal employer-employee relationship and performed on-demand with no expectation of an ongoing relationship (Riggs et al., 2019). This is commonly termed as 'gig work' where workers are paid per work/gig one does. A broader institutional setting in which the gig happens is referred to as the 'gig-economy' (Riggs et al., 2019). The term 'gig' itself comes from the music industry where independent artists would perform for one event with no expectations of future work (Abraham et al., 2017). While on the one hand such work presents a good match of job opportunities, allow flexible working schedules and redefines the understandings around the boundary of a firm, they also lead to a severe commodification of work (De Stefano, 2015).

A gig economy works well for freelancers who could sometimes have a more permanent stable work, and such side gigs become a source of extra income. Since they are remotely located and the work is done and delivered online, it gives them the freedom to maintain their own schedules and work from the comfort of their chosen environment (de Ruyter et al., 2018). With an increasing number of independent workers choosing to offer their services on digital platforms, the conventional ideas about where and how work is undertaken is being challenged. While such shifts create potential benefits, they create uncertainty as well (Manyika, 2017).

The gig economy could have long-lasting effects on the future of work itself which could evolve rapidly as more people across the globe have access to digital services. A recent global survey revealed that 40% of employers explain entry-level job vacancies as due to a lack of skills and 60% consider that new graduates are not adequately prepared for new jobs (Manyika, 2017). While there are gaps in technical skills, students are viewed as lacking in soft skills such as communication, teamwork, etc. In another survey, about 37% of the respondents (jobseekers) said their current jobs don't utilize their skills completely (Manyika, 2017). This suggests that education systems might need to adapt to be better prepared for a changing workplace environment. This could require bringing about changes to modes and platforms of knowledge delivery (Peters, 2017).

Work-integrated learning is generally referred to the practice of combining traditional academic learning with exposure to work environments in a chosen domain to prepare undergraduates better for the professional workplaces (Jackson, 2015). It typically includes internships, field works, sandwich year degrees, job shadowing and cooperative education (von Treuer et al., 2010). Integrated learning and work create graduates who are job ready primarily due to an exposure to the work environment and a higher confidence in their working capabilities (Billett, 2011; Ide & Thomas, 2011). It also provides students with a better understanding of the nature and standard of industry-required skills (Gamble et al., 2010) and a better appreciation of the world-of-work (Wilton, 2012). Studies regarding employment of post graduates report a correlation between those with work experience and early employability, emphasising that students in most areas of study, including business, management and finance, with some work experience, are advantaged in the job market compared to their peers with no work experience (Bowes & Harvey, 2000).

With the advent of the 'gig-economy' and the nature of work itself undergoing changes, the concept of employability has also been evolving. Specifically, for graduates, there has been substantial research on the skillsets that need to be enhanced by them to be more 'employable' (Bui et al., 2019). Graduates need both 'soft' skills, such as communication skills and team working skills, and 'hard' business knowledge, such as qualifications and the ability to apply theoretical and conceptual knowledge to real life business situations to be employable (Andrews & Higson, 2008). In addition to these skills Bridgstock (2009) suggested that graduate employability could be enhanced by developing career development skills. Graduate employability has also attracted substantial attention from everyone because of higher fees and stronger competition (Tomlinson, 2007).

An understanding of the agents and factors involved and affecting the employability of graduates was a key to understanding what directions to inquire into. The research would build up on these facets of the literature survey to help create work and employability related opportunities for the graduates of the Bachelor of Creative Technologies program at AUT. This research project aims to examine the existing challenges faced by students and recent graduates from the field of Creative Technologies to find appropriate entry-level jobs in Auckland, New Zealand. The intent is to suggest pathways that will equip them with better job opportunities. The project applies the methodology of Research through Design (RtD) framing the research proposal as a design brief that asks:

“What do we need to know in order to support recent graduates in Creative Technologies to find job opportunities that lead them to successful careers?”

RtD links the problem-solving purposes of design practice with the knowledge-creation purposes of design research (Markussen, 2017). The research itself identifies the areas of interest, levels of expertise of students and matches that with the requirements of the industry. It draws from the experiences of recent graduates and current BCT students and builds on it to research and design a platform that helps create better work opportunities for them. It also works to keep the student community abreast with the industry expectations. The platform in the process, adds value to the students' expertise and practical industry experience. RtD has been defined as a kind of research relevant for design or as a kind of research for design that produces original knowledge (Findeli et al., 2008). RtD is an approach to systematic inquiry which seeks to take advantage of the unique insights gained through the design practice to provide a better understanding of complex and future-oriented issues in the design field (Godin & Zahedi, 2014). RtD is a research approach that employs methods and processes from design practice as a legitimate method of inquiry (Zimmerman et al., 2010). RtD allows researchers to rely on designerly activities as a way of approaching messy situations with unclear or sometimes even conflicting agendas. Some of these situations might not be even suited for other methods of inquiry. RtD, as a process of inquiry revolves around the making of a product, service, environment or system. In this process, the knowledge that is gained could be completely implicit residing almost thoroughly within the resulting artefact (Zimmerman et al., 2010).

Research Methods

This research originates from the perception that recent graduates from programmes such as the Creative Technologies in AUT are not landing up entry-level jobs to their satisfaction which could lead them to successful careers. The research is an inquiry into the need to create

better work opportunities for graduates of the Bachelor of Creative Technologies (BCT) program at Auckland University of Technology in Aotearoa New Zealand. The research objective for this project is framed as:

To create evidence-based strategies to support recent graduates in Creative Technologies find job opportunities that lead them to successful careers, and which specifically:

- 1) Expose students to industry through opportunities for internships and employability*
- 2) Provide industry with early-career staff that have transdisciplinary skills and mindsets*

Research through Design (RtD) is selected as an appropriate methodology for this project because it allows to frame the research question as a design brief. The need to help graduates get better work opportunities, i.e. the notion of creating a better future to create a better state of being are all aspects of RtD. The research project creates the artefact, in this case the 'Employment Agency' or referred simply as agency here forth, which is essentially a representation of all the changes that need to be brought in to help the graduates get better work opportunities. The agency goes further to suggest evidence backed pathways to achieve this better future.

The RtD approach also requires the researcher to be a practitioner, because "knowledge of design allows the interpretation of research information in context" (Hanington, 2003, p. 17). To achieve this, RtD as a process, advocates the constant realignment of the construction of artefacts, based on trial and error, to better tackle complex design problems (Toeters et al., 2013). Conceptually RtD can also be looked at as a process where one learns by designing. Here the researcher learns about the object of their inquiry through the constant evolution of the artefact (Toeters et al., 2013).

An RtD research could follow a 5-step approach to undertake a project (Zimmerman & Forlizzi, 2014).

- 1) Select*
- 2) Design*
- 3) Evaluate*
- 4) Reflect and disseminate*
- 5) Repeat*

The 'Select' stage involves inquiring the research problem to see if it lends itself to investigation via RtD. Here the researcher checks if the problem is a wicked problem with

multiple agendas and driven by multiple stakeholders and could be addressed by the application of design thinking. The *'Design'* stage that follows starts with a literature review to understand the state of the art and the questions and concerns of other researchers working in that space. In this stage of the research, through workshops or exploring ideas in the studio, the researcher attempts to understand the existing state of the problem world and how that might offer a new perspective, a new problem framing, which could provide a path to a preferred future.

After the initial framing the researchers could explore further by creating product/service ideas and then select and iteratively evolve and refine an idea into a completed form. This process of exploration by making and then critiquing helps the researcher *'evaluate'* and challenge the initial framings. In this stage, each new concept generated offers a different framing through its manifestation of a solution space. For the researcher, part of the critique is the explication of the proposal embedded in their proposed solutions. Here the researcher also reflects on how framing of the situation has evolved and the reasons for these changes. The *'evaluate'* stage is followed by the *'reflect and disseminate'* stage where the researcher reflects on the learning from the project and works to distribute and propagate the knowledge gained from the research. The last stage of the process is the *'repeat'* stage which suggests repeatedly investigating the same situation for best research results (Zimmerman & Forlizzi, 2014).

RtD shares principles with other research methodologies used in design, including project-grounded research (Grocott & Sosa, 2018), constructive design research (Koskinen et al., 2011; Wensveen, 2018), and artistic practice-led and practice-based (Koskinen et al., 2011; Candy, 2006). These methodologies share an emphasis on the creation process being a "way of investigating what a potential future might be" (Zimmerman et al., 2010, p. 312). This aspect especially suits our research since our outlook is also to help construct a better future at least in the context and space of our work.

To structure the practice aspects of this project, a 'Design Thinking' (DT) framework is used. DT is a way of working that leads to transformation, evolution, and innovation to new forms of living and new ways of managing business (Tschimmel, 2012). DT is a human-centred approach, which shapes collaborative work and co-creation with stakeholders. Our research was designed to work collaboratively with the stakeholders and create a design with the users and not just for the users (BCT stakeholders in our case). It was therefore important to identify the stakeholders at the early stages of the research. These would be people who are closely involved with the BCT program and the local Creative Technologies industry. The research is inductive given its exploratory nature and would adopt qualitative methods. The data collected from the

participants was primarily their views, experiences, and perspectives about work related opportunities in the creative technologies space for BCT graduates.

Subsection: Interviews

Semi-structured interviews are selected as a method for this project to narrow down the area of questioning to the participants (Lou & Wildemuth, 2009). An un-structured interview would not completely elicit topics or themes required for this study, from the participants. A questionnaire would leave little scope for the participants to contribute information about their experiences and perspectives. Semi-structured interviews allow the researcher to cover specific topics while also allowing the participant to tell their personal experiences and views (Rabionet, 2011). In the absence of a strong theoretical foundation from which to draw in order to do surveys or questionnaires, semi-structured interviews were the best method to collect data in an inductive research approach. They are also appropriate here since the research does not need to collect a statistically representative sample or an average view, but are more interested in a few and richer viewpoints from multiple actors because their voices will reveal important issues to consider as the result of this study.

The use of semi-structured interviews requires a certain level of initial study and understanding in the research topic as the interview questions are based on previous knowledge (Wengraf, 2001; Kelly et al., 2010). To guide the interview an interview guide was formulated which helped determine the initial set of questions (Mason, 2004; Rubin & Rubin, 2011). This guide covers the main topics of the study, but at the same time gives scope to explore the research area by collecting similar types of information from each participant, by providing participants with guidance on what to talk about.

These interviews were then designed and conducted to collect the data from the stakeholders. This allowed the researcher to ask open-ended questions and only give directions to the discussions with the participants while letting them be at the comfort of expressing everything that came to their mind when talking about a subject. The intent for the interviewer was to be an active listener and to allow the participants to speak freely about their experiences, issues, feeling, perspectives about working after graduation, internships, their current exposure to industry, their experiences hiring students and graduates, their expectations, and any other aspects they would want to cover. The interviewer was thus able to draw out pertinent information from the participants and could get them to highlight upon aspects that were important to the different interviewees. This also prevented the researcher from bringing in any unwanted bias into these interviews. These interviews and the entire interviewing process were

designed to ensure the interviewer retains the initial vision and engagement throughout the research process (Kvale, 1996).

To discern the stakeholders who would act as participants in the interviews a short consultation study was conducted. This consultation study would primarily inform the design of the data collection methods. This was conducted to understand their perception of this research project. This also helped understand if these were the appropriate methods and participants for this research. The strategy was to make general queries to understand how a range of stakeholders look at the research problem. The consultation study mainly helped achieve two things. First it helped confirm who the participants would be, namely the final year students, recent alumni, and industry practitioners who have worked with Creative Technologies graduates. Second, it helped give the final shape to the interview protocol. This also helped to initiate the formal process of taking the approval from the university ethics committee to proceed with the research.

Separate approaches were planned and executed to reach out to the different participant groups. To reach out to the students a poster (attached in the Appendix) was designed to be displayed in the studio space where they would attend classes. A brief about the research was shared and the students were invited to contact the researcher. The inclusion condition was that they had to be third year BCT students and the exclusion condition was that they should not have, in that semester, taken any subjects taught by the first supervisor. To reach out to the recent BCT alumni, a social media post touching in brief the aspects of the research and how it could benefit everyone in the creative technologies community was created. It was then shared in a Creative Technologies group, on a popular social media platform, which had a large number of BCT alumni as active members. Industry experts were reached out primarily through personal contact or suggestions from the other participants. The inclusion condition for them was that they should have worked with creative technologies graduates in the past.

To recruit interviewees, participant information sheets and consent forms were used when meeting the participants for the interviews. Individuals who showed interest in participating in the research were then contacted with the participant information sheet where details of the research were shared with them. When they confirmed their participation for the research, the participant consent forms were shared with them and thereafter the interview was conducted at a convenient time, again with their consent. During the interview they were

asked questions related to the research and they were given the scope to share their experiences and views. The interview protocol followed is shared in the appendix.

For the research, the initial plan was to interview nine participants, but due to the COVID-19 pandemic, some of the latter interviews had to be postponed initially and eventually one had to be dropped. Overall a total of eight participants were interviewed, three men and five women. Four of these were industry representatives. Among them were the CEO of a digital agency, a technical and recruitment head of a company at the forefront of creative technologies and a representative of the local city council involved in the development of creative technologies. Among the students and alumni interviewed were an entrepreneur who had recently started their own venture and another who had exposure to freelance work in the industry. All the alumni and students had some recent experience as interns at small or large companies working in the creative technologies domain.

Interviews varied from 20 minutes to 40 minutes and were held at the university premises. Basis the interactions in the first three interviews, it was realized that if the same questions were slightly reframed, they could be better communicated to the participants. Therefore, the language of the questions was slightly reframed. This helped in getting an even more effective involvement from the participants in the remaining interviews. The interviewees were asked about their views on the core skills for a BCT graduate, and the kind of companies that are a better fit for these skillsets. They were asked about how networking with professionals can be increased and how members of the industry could be better informed about their skillsets. The industry experts were additionally inquired about what profiles they would hire these graduates for. The interview questions were designed to give a sense of direction to the discussions and allowed participants to speak at length on the topics. With permission from each participant, the interviews were audio recorded and transcribed.

Subsection: Data Analysis

After each interview, reflective journaling was conducted to associate closely with the data. For analysis of the data, thematic analysis was used. Terry et al., (2017) approach of a six-phase analytic process of thematic analysis was used to analyse the data. The first phase of familiarizing with the data was carried out shortly after each interview by reading the data and making observational notes. This gave a good sense of the entire dataset and was greatly beneficial in the next phase of generating codes. Coding of the data helped to systematically create labels for specific segments with a meaning relevant to the research project. The final compiled list of codes helped in the next phase of constructing themes out of the data. For this, the codes and the associated data were examined and clustered or collapsed to derive more

meaningful patterns. Thereafter with an increased clarity of the idea or the central concept arising out of these grouped codes helped derive the underlying themes within them. The next phases which included reviewing and defining the themes checked that the themes worked well with the data and the research project, ensuring each theme accounts for the central organizing concept captured by the coded data. Finally, defining the theme was carried out such that they drew a complete picture of the data. The themes were then named.

While reviewing the grouped codes, multiples ideas started shaping out, which would later take shape into more cohesive themes. Some of the major early groupings were about what the university needs to do (both from a students' and industry experts' perspective), what industry experts expected from a BCT graduate and the existing gap between these expectations and the capabilities of the graduate, the existing student-industry engagement platform and what to do about them, and what kind of efforts have to go into informing industry professionals better, about the transdisciplinary skillsets of the BCT graduates. These ideas, were iteratively combined, divided, and connected to finally merge into three themes that capture the essence of all these ideas.

The three main themes discussed in detail in the Results section of the manuscript are:

Theme 1 – Unexplored existing opportunities

Theme 2 – Upskilling the Graduate's 'Employability Skills'

Theme 3 – Developing Student-industry interaction platforms

The findings that emerged from the interviews were processed to arrive at an actionable design. While these insights guide the design of the "Employability Agency" (or simply referred as the agency) , they are not concrete solutions, but rather pointers to synthesize new ideas based on evidence. These need to be brought back to the stakeholders involved in the research process to obtain their views. Their feedback will help evaluate and validate these ideas in order to make a final set of proposals and action plans for all stakeholders involved.

Design Synthesis

An RtD project is an investigation which revolves around the construction of an artefact, product, or a service. The design of the artefact is the culmination of the research project and the knowledge gained is implicit and within the resultant artefact (Zimmerman et al., 2010). The construction of the artefact is a representation of the understanding of a preferred state of being in as far as the research problem is concerned. The research aims to inform the creation of an evidence-based solution (an artefact) to create employability-related opportunities for BCT

graduates and act as an interface between students and industry. The process of making the artefact is what helps build the conceptual pathways that the agency proposes, to create better employability related opportunities for the graduates.

Prior to this study, we had imagined a concept of a student-led agency that could work towards creating job opportunities for students. This study has helped to inform this nascent idea by confirming as well as suggesting new ideas. The research gave concrete evidence about the pathways that could be undertaken to improve work and employability related aspects for the graduates. It not only, confirmed some existing notions, but also strengthened them by backing them up with supporting data. Additionally, all the data backed evidence helped build strong understandings about other aspects about work opportunities for the graduates. These ideas are discussed in detail, backed by evidence in the closing chapter of the thesis.

Prelude to the Manuscript

The second chapter is the manuscript which documents the research process with the three main themes derived out of the data analysis discussed in detail. These findings provide two types of actionable insights to consider in the design of a set of solutions: first, three general observations that were inductively formulated from across the interviews, and second more specific insights grouped by the three groups in our thematic analysis. The manuscript discusses these in detail and explains how these insights shape the pathways that the agency proposes to support recent graduates in Creative Technologies find job opportunities that would lead them to successful careers. The closing chapter that follows the manuscript further builds upon the design of an agency informed by this research. It builds up on the feedback of the stakeholders involved in the research and uses this to develop pathways for solutions to the issues identified by the participants in the interviews. It attempts to then connect the research study with existing literature and highlights the different perspectives the industry, university and students have around it. The last chapter also includes reflections on the research process and its findings and closes with new questions that the research has highlighted.

Chapter 2: The Manuscript

Title: Landing your first job in transdisciplinary Creative Technologies: A Research through Design approach

Authors: Rajiv Rajusha, Ricardo Sosa, Amabel Hunting

Keywords: Creative Technologies, Employability, Research through Design

Introduction and Background

The influence of technology is changing as evidenced by the term ‘Fourth Industrial Revolution’ (Schwab, 2017). This new era calls for future technologists with creative and transdisciplinary skillsets. The field of ‘Creative Technologies’ aims to prepare graduates with such expertise. These professionals display skills and dispositions that go beyond traditional roles in well-established areas, such as Engineering and Design. In the short term, however, recent graduates of Creative Technologies can find it challenging to find work opportunities where they can apply and continue to hone their unique skills. This research study seeks to inform a design-led project of an employability agency for recent graduates of Creative Technologies in New Zealand. The paper presents a research project that originates from an identified need to prepare work-ready graduates and connect them to industry.

The term ‘Creative Technologies’ does not have a single accepted definition (Connor, 2016). The term refers to the integration of practices and knowledge from various disciplines ranging from Fine Art, Computer Science, Design, and Engineering. Graduate profiles of university programs in this area are typically oriented towards imaginative synthesis (Connor & Sosa, 2018). Graduates of creative technologies can be transdisciplinary inasmuch as their practices transcend conventional disciplinary boundaries (Russell et al., 2008; Giri, 2002; Gibbons & Nowotny, 2001). The focus of this research is on the transdisciplinary student’s experiences as they are a unique and growing student body who have been under-represented in research to date.

The research builds upon the existing literature on employability (Tomlinson, 2017; Bui et al. 2019; Holmes, 2017; Tholen, 2015; Rothwell & Rothwell, 2017), future of work (Cook, 2008; Schwab, 2017; Manyika, 2017), the gig economy (Riggs et al., 2019; Abraham et al., 2017; De Stefano, 2015; Healy et al., 2017; de Ruyter et al., 2018) and work-integrated learning (Jackson, 2015; von Treuer et al., 2010; Ide & Thomas, 2011; Billett, 2011; Gamble et al., 2010; Wilton, 2012). These areas help to inform the project’s goal to examine how different stakeholders look

at employability in this area, and how the very nature of this type of work is changing in the local industries. Effectual entrepreneurial thinking guides the research about work opportunities for these transdisciplinary students and recent graduates in a relatively new field like Creative Technologies (Sarasvathy, 2001). The main goals are to assist current students and recent graduates land their first job based on their skillset and career plans. This requires them to be knowledgeable of the local industry dynamics and creates exposure for them to the corporate world.

This research project aims to examine the existing challenges faced by students and recent graduates from the field of Creative Technologies to find appropriate entry-level jobs. The intent is to suggest pathways that will equip them with better job opportunities. The project applies the methodology of 'Research through Design' (RtD) framing the research proposal as a design brief that asks:

“What do we need to know in order to support recent graduates in Creative Technologies to find job opportunities that lead them to successful careers?”

RtD links the problem-solving purposes of design practice with the knowledge-creation purposes of design research (Markussen, 2017). RtD is an approach to systematic inquiry which seeks to take advantage of the unique insights gained through the design practice in an attempt to provide a better understanding of complex and future-oriented issues in the design field (Godin & Zahedi, 2014). RtD is generally defined as a kind of research relevant for design or as a kind of research for design that produces original knowledge (Findeli et al., 2008). Relevant methodologies include project-grounded research (Grocott & Sosa, 2018), constructive design research (Koskinen et al., 2011; Wensveen, 2018), and artistic practice-led and practice-based (Koskinen et al., 2011; Candy, 2006). These methodologies share an emphasis on the creation process being a “way of investigating what a potential future might be” (Zimmerman et al., 2010, p. 312).

Design of the Study

This research stems from identifying a need to create better work opportunities for graduates of the Bachelor of Creative Technologies (BCT) program at Auckland University of Technology in Aotearoa New Zealand. The research objective for this project is framed as:

To create evidence-based strategies to support recent graduates in Creative Technologies find job opportunities that lead them to successful careers, and which specifically:

1) Expose students to industry through opportunities for internships and employability

2) Provide industry with early-career staff that have transdisciplinary skills and mindsets

To address this, a design-oriented research project is created to examine the views, perspectives and experiences of those closely involved with the BCT program and the local Creative Technologies industries. Due to its exploratory nature, the project follows an inductive research strategy and adopts qualitative methods to help us identify the issues shaping the experiences of current students, graduates, and employers. The data collected hinges on what stakeholders think about issues related to work opportunities for the BCT graduates. To collect the data, we designed and conducted semi-structured interviews. The open-ended questions allowed the interviewees to expound their views without being constrained in terms of what the researchers may anticipate being the issues at play.

A pilot consultation study was conducted to inform the design of the interviews. This was conducted to understand their perception of this research project, and to understand if these were the appropriate methods and participants for this research. The strategy was to make general queries to understand how a range of stakeholders look at the research problem. The intent for the interviewer was to be an active listener and to allow them to speak freely about their experiences and perspectives.

The pilot consultation interviews confirmed the value of interviewing final year students, recent alumni, and industry practitioners who have worked with Creative Technologies graduates. The final interview protocol was set up and approval obtained from the university ethics committee to proceed with the research. For the selection of students, a poster was displayed on the studio space where they attend classes. A brief about the research was shared and students were invited to contact the researcher. A social media post touched in brief the aspects of the research and how it would be beneficial for everyone in the Creative Technologies community, and it was used to reach out to alumni who are members of a related group in a popular social media platform. The industry experts were reached out through personal contacts and the interviewees' suggestions.

A total of eight people were interviewed, three men and five women. Four industry representatives were interviewed which included the CEO of a digital agency, a technical and recruitment head and a representative of the local city council involved in the development of creative technologies. Among the student and alumni interviewed were an entrepreneur who had recently started their own venture and another who had exposure to freelance work in the industry. All the alumni had some recent experience as interns at small or large companies working in the creative technologies domain.

Participant information sheets and consent forms were used in the recruitment protocol. Participants expressed high interest and enthusiasm for the topic of this project. During the interviews they spoke openly and expressed their views, experiences, and perspectives on the subject matter. Interviews varied from 20 minutes to 40 minutes and were held at the university premises. The interviewees were asked about their views on the core skills for a BCT graduate, and the kind of companies that are a better fit for these skillsets. They were asked about how networking with professionals can be increased and how members of the industry could be better informed about their skillsets. The industry experts were additionally inquired about what profiles they would hire these graduates for. The interview questions were designed to give a sense of direction to the discussions and allowed participants to speak at length on the topics. With permission from each participant, the interviews were audio recorded and transcribed.

After each interview, the first author conducted reflective journaling to associate closely with the data. For analysis of the data, thematic analysis was used. Terry et al., (2017) approach of a six-phase analytic process of thematic analysis was used to analyze the data. Familiarization with the data was followed by creating codes which were then grouped and reviewed and shaped eventually into themes. While reviewing the grouped codes, multiples ideas started materializing, which would later take shape into more cohesive themes. Some of the major early groupings were about what the university needs to do (both from the students' and industry experts' perspective), what industry experts expected from a BCT graduate and the existing gap between those expectations and the capabilities of the graduate. Additional insights were on the existing student-industry engagement platform and what to do about them, and what's needed to inform industry professionals better about the transdisciplinary skillsets of the BCT graduates. These ideas, were iteratively combined, divided, and connected to finally merge into three themes that capture the essence of all these ideas. The three main themes discussed in detail below in the Results section are:

Theme 1 – Unexplored existing opportunities

Theme 2 – Upskilling the graduate's 'Employability Skills'

Theme 3 – Developing student-industry interaction platforms

Results

The analysis of the interview data resulted in three main themes discussed here in relation to our research project, with an emphasis on how they inform the construction of the

artefact of this Research through Design project, tentatively referred to as an 'Employability Agency for Creative Technologies', or the agency for short.

Theme 1 – Unexplored existing opportunities

The first important theme to emerge from the interviews is about opportunities that are already available in this area. These findings draw attention to what already exists, provide evidence of its value, and suggest ways to make the best of it.

Firstly, the interviews suggest that several graduates occupy roles that are more specialized or mono-disciplinary, rather than trans-disciplinary. This option for BCT graduates to specialise in a narrower and more traditional field is confirmed by the job title that many BCT graduates choose to identify with in their LinkedIn profiles, including those of our participants: Interactive Art Installation Designer, Digital Designer, Software Developer, Interactive Video, and Game Developer. This is also consistent with the job advertisements commonly found at present in New Zealand employment marketplaces such as seek.co.nz using the keyword "creative technologies": UX UI Designer, Data Engineer, Front-End Web Developer, Digital Campaign Manager, and IT Tutor. Some of these positions are associated to more traditional Design, Art, or Engineering programmes rather than a transdisciplinary area like Creative Technologies. To quote a recent graduate who had further pursued postgraduate studies and then gone on to start their own firm:

"In terms of the BCT graduates I do see a lot of people gravitating towards sort of single disciplinary jobs". (Abel, recent graduate, entrepreneur)

Interviewees expressed that the reasons for this *gravitation* towards more traditional roles included that students who initially choose Creative Technologies, identified with more specific areas of their interest as they completed their studies. Another reason was that the job market offered a limited number of entry-level positions that require a transdisciplinary skillset, so BCT graduates had to compromise and apply for the more traditional jobs available. Time and money pressures right after graduation seemed to have been a contributing factor as well. They stated that while some graduates were happy at the prospect of having landed a job, others find these traditional roles unsatisfactory. A view shared among interviewees was that in the long run, working at such jobs was underwhelming and unsatisfactory. When inquiring about whether BCT graduates felt their transdisciplinary skills were not completely utilised at most existing work opportunities, Samantha, a BCT student, expressed their disappointment that not all of their skills were being used. To quote them:

"If I am going for a certain role, I would still be very disappointed in myself because I have spent so much time and effort doing this and that and when I move out of it, I will get a job

where I am only doing this. So, all those other efforts that I put into it for my course I paid for, I would be disappointed. Yes, and I don't want to go out looking for a job that has this one position." (Samantha, BCT student)

A second aspect related to unexplored existing opportunities is regarding the type of companies a BCT graduate aspires to join. The recent graduates interviewed expressed their preferences to work at start-ups and smaller sized companies as they perceive this would help them hone their transdisciplinary skillsets. As an interviewee put it:

"Yeah, smaller companies and start-ups are by merit of being smaller and having, spreading the workload across a smaller group of people, have more need for sort of transdisciplinary skills of at least mindsets. I feel like bigger companies are much more, like if you intern for a bigger company, they are like you are doing this role, this is what like, there are so many pieces in play, they can't have, like it's harder to have people who are free floaters". (Aaron, recent graduate).

Aaron expressed feelings similar to other recent graduates who felt that working at a start-up is more advantageous because they look for people who can fit into multiple roles and positions. This leads them to the inference that people working in smaller companies have a transdisciplinary mindset, like the BCT graduates. Additionally, they felt that large companies have very set processes and defined roles, which were not suitable for a graduate in this field.

This view was only partially shared by the interviewees from industry. They did not consider that size of the company was a key factor, as to where the BCT graduates should look for work opportunities. According to them, the biggest factor would be to work at a place where they can be mentored by an expert. One interviewee said:

"I think companies that are mid to well established with a good art director or senior design team available for guidance and mentoring". (Susan, industry expert)

This insight coming from industry experience points toward companies in the creative technologies domain that have the bandwidth and expertise to provide students and fresh graduates with a level of mentoring that helps them grow. Small start-ups seem less likely to afford such mentorship opportunities. This insight would seem to require that the graduates have a change of outlook. Instead of aspiring to work predominately at start-ups or small companies they need to consider the career advantages of working at companies where they can learn from seasoned experts.

In addition to mentorship, industry professionals referred to other advantages for fresh graduates when working in bigger rather than smaller companies. They mentioned that start-ups may not be the best places for a graduate to learn because of the constraints that they have in terms of the number of people and the availability of time and resources.

A third aspect of the existing work opportunities that could be re-examined are internships. Currently, the BCT programme offers students varied opportunities, including internships, to give a leg up into the environment where they will work in the future. Internships help students learn professional work skills and network with people, which could go a long way in deciding how successful they are in their career. However, when discussing internships, a seasoned professional mentioned that the current model of internships in Universities may need to be re-evaluated:

“But I just wonder if the model of internship is outdated. And maybe that needs to be relooked at”. (Heather, industry expert)

The participants suggested that the model of internships, including those at place in the BCT, deserves more attention in future studies with the perspective that alternative models might work better for transdisciplinary students in the creative industries. One of the interviewees used the term ‘project-based internships’, where students ought to be associated with the internship for the length of the project and not be time bound as most current internships are. Project-based work is better aligned to the learning experiences of the BCT. A “project-based internship” would take a person through the entire lifecycle of a project, thus simulating better the actual work conditions in the industry and it would be a better simulation of freelance work.

A fourth aspect of existing opportunities is exposure to an entrepreneurial environment, which most interviewees considered to be important. They expressed that the BCT learning experience already motivates students to think entrepreneurially, but more needs to be done to enable students to act upon their entrepreneurial abstractions. As one interviewee commented:

“I think, when I first started the whole kind of idea around BCT, and what we were doing was the fact that we were building up for jobs that were not created and that a lot of the reason why we needed a kind of entrepreneurial streak is because the things that we wanted to do hadn’t been made yet or they hadn’t been offered as a job, or there wasn’t a company that hadn’t started that yet”. (Adele, recent graduate)

A graduate who had turned into an entrepreneur, reflected that an external push was what helped him venture out and taught him the rigours of starting up their company. Interviewees suggest that entrepreneurship remains an unexplored opportunity for the BCT graduates and, by providing the right environments and platforms, it could lead to the inception of more start-ups.

Participants felt that students could be more active in terms of reaching out to people to find the right work opportunities. Some also felt that companies could do more to make opportunities visible, but the prerogative was on the students and recent graduates. A BCT student though had a different perspective on this. She felt that the industry was not very aware and confident about Creative Technologies and the transdisciplinary skillsets of these graduates, and therefore there weren't many jobs advertised matching their skillsets. As she stated:

“Creative tech is very new, you search up anywhere, there's barely any jobs out there. So, a lot of times people don't know, so they don't highlight in the job prescription what a candidate should have or not”. (Samantha, student)

It was argued, that while transdisciplinarity is the forte for these students, they end up in mono-disciplinary roles. It appears this is due to their own insecurities and a lack of such roles being offered by industry. Having exposure to multiple disciplines gives them the edge to also work exclusively in one of these disciplines if required and thus be employable in more traditional roles, although that's not perceived as a space where they are using their full potential as creative technologies graduates. Another aspect is that they might have interest in a single domain and are utilizing the BCT platform to holistically understand how things work together. This would appear to be a manifestation of the multiple electives and self-directed studio briefs the BCT program provides to help students choose their own path towards growth and expertise. While working and growing in a uni-disciplinary role would build on only one skill, it would still allow these graduates to be in a better position than others if they need to pivot to other disciplines at a much later state in their careers.

In conclusion, start-ups are perceived by the students to offer roles with which they associate better due to their own entrepreneurial outlook. This is also because start-ups and smaller companies use creative technologies in a disruptive way, according to the interviewees. While this provides them with the opportunity to be at the fore of path breaking changes in technology, a lack of mentoring and learning at such avenues might leave them misguided and directionless. Alternatively, slightly larger companies would help them achieve holistic growth and mentorship to grow into better professionals. New out-of-the-box Internship models that suit non-traditional transdisciplinary roles should be explored. Additionally, the university should identify and promote avenues for students to exhibit their entrepreneurial potential.

Theme 2 – Upskilling the graduate's 'Employability Skills'

While multiple industry experts expressed the view that the BCT graduates are highly skilled at Creative Technologies, they felt there was a void that could be covered in terms of upskilling them that would make them more employable. Interviewees identified collaborative

and problem-solving skills, and professional work skills as the main areas of improvement for students to have an effective transition to the work environment. Professional work skills included communication skills, those soft skills with an emphasis on basic work etiquettes, and networking skills. The industry experts expressed an expectation for a level of professionalism from the BCT graduates who work with them. A recent graduate, recalling their internship experience acknowledged that industry work experiences help in developing these skills:

“You start to learn skills that BCT can’t offer. Just probably because they don’t have enough time to teach us that. So, it’s good to have. Professional skills, getting to ask questions to a professional one on one is extremely helpful, just kind of building those, kind of connections through that”. (Adele, recent graduate)

Being better communicators not only makes students more valuable for the company where they work, but also gives them a better start in finding more opportunities due to their improved ability to communicate their skillsets and ideas. As an industry expert articulated:

“A really important skill I recommend people would have is how to communicate ideas. I have an idea, or I have an application or something like that, how can I communicate that’s things effectiveness, how can I communicate that idea of that thing effectively with background information and reference and everything. So basically, being able to communicate ideas effectively at the very least”. (Jack, industry expert)

Basic work etiquettes such as punctuality, email writing ethics, understanding how to address clients, track work and perform as a team member, were identified as the main professional skills that would help graduates stand out. An industry expert lamented the lack of these skills in some graduates who have had joined them and had created some embarrassing situations at work.

“I think it’s a little bit of the soft skills. Someone who, I kind of class communication skills under professionalism, and basic professionalism as in showing up on time, giving fair warning if they are unable to come, being able to dress appropriately ..., like what you want to wear, for example when we have an event or something and we are going to a meeting with a client we don’t want to see like ripped shorts and bright red socks up to the knees sort of thing. I am giving that as a live example of something that’s happened.” (Kate, industry expert)

The general perception among interviewees was that ‘networking skills’ would enhance the job-hunting effectiveness for students. The industry experts felt that the better the students get at networking, the more opportunities would open up for them. Another industry expert suggested that the students and graduates be more proactive in locating networking opportunities and to be present there prepared with their business cards, show reels on their phones to be able to connect better with the relevant community.

Collaborative capacities and problem-solving skills were also deemed as strategic skills that the graduates should excel at. While these appear to be skills students tend to pick up

during their years at university, the data suggests that more emphasis needs to be put in developing them in the students before they enter industry. To quote an expert when inquired what skills they look for in graduates to join their team:

“Core skills - I think that the biggest one is the ability to collaborate, which is from what I have seen in terms of design graduates across multiple disciplines is that this particular degree teaches, like its collaborative, its colab, like it teaches collaborative work more than anything else, so that’s the one main thing is understanding, I would like purposely bring in a BCT grad for collaborative purposes”. (Heather, industry expert)

While it would appear that BCT graduates excel in their areas as transdisciplinary experts, there is a need for some upskilling for them to be better at collaborative skills, problem solving skills and to make them professionally more prepared for excelling as transdisciplinary experts.

Theme 3 – Developing student-industry interaction platforms

The third important theme that evolved out of the data analysis was a result of interviewees stressing on the need for improving contemporary and aiding newer platforms for student-industry interactions. These include pathways for improving aspects of existing events and processes, as well as creating new avenues and systems for students and industry personnel to interact. The university is seen as having a major role to advance these ideas. Interviewees agreed that the BCT program produces skilled graduates, and many of them further described these graduates as being better prepared than the average in the industry. Moreover, some interviewees reflected on the perceived advantages that BCT graduates bring to industry as evidenced by an industry expert’s response:

“When I worked with AUT grads that we had, they were miles ahead of what anybody else could do. Like there’s not much of that happening in NZ, so I think that’s actually the problem more than anything and I would be really sad for BCT students, if AUT thought that they had to change what BCT was, to conform to the industry.” (Heather, industry expert)

The first aspect the data analysis proposes is about changes to how the existing student-industry interactions are handled, with a focus to strengthen existing relations and establish new ones. One industry expert when inquired about what could be done at the university’s end to create stronger student-industry relationships, mentioned the idea of creating ‘industry allies’. These would be people who work with the university and their networks to promote more of such talented creative technologists.

Secondly, the university’s engagement program with smaller to medium-sized companies is seen as needing strengthening. When inquired if the university should reach out to such companies, a recent graduate who had seen this closely, said it was difficult:

“Yeah, like the smaller sort of start-ups or sort of not start-ups but just beyond that, coz I know it can be quite daunting to engage AUT”. (Abel, recent graduate, entrepreneur)

The third aspect towards building the university’s engagement with industry is to improve student-industry interactions by trialling improved internships models that monitor students’ progress and learning. Talking about the importance of monitoring internships, one industry expert suggested that unmonitored internships could affect the student’s wellbeing and/or be a waste of time. Another industry expert spoke about students not taking internships seriously, which affects the industry professionals’ perspectives towards inviting students in future, and their relations with such educational organizations. Developing new internship models would help create long-term relations with industry while strengthening existing relations with companies.

The fourth aspect towards building the university’s engagement with industry to improve student-industry interactions would be reconsidering the current events organised at the university. The current showcase is an annual two-hour event held after the end of the semester in November. Students from all years put up their work in the studio space for Creative Technologies. Industry experts interviewed expressed a high level of interest in the content of the annual show. At the same time the industry experts mentioned that certain aspects could be refined, like the duration, location, and presentation to improve its overall output. Recent graduates also spoke about the lack of time and space at the current student showcase which leads to the students losing a lot of ‘punch’ in their work.

Apart from the showcase, interviewees suggested that organizing events incorporating interactive elements like panel discussions or hackathons, with students leading some of them would help build platforms for student-industry interactions. An interesting aspect here is that such events were organised at the university earlier but were discontinued, potentially due to a lack of feedback from industry and other stakeholders about the value of such events. Another industry expert commented that seeing students involved in the organisation of events helped them to look out for students they might consider hiring as well. As Kate stated:

“I am a big believer in events doing a lot of good to showcase how good students could be, especially because usually the most competitive students are the ones who are there. I think that in a sense the interactive events, events where people are working together in groups to create projects like game jams, hackathons things like that. You can see the work and you can see the processes and the problems and problem solving. That to me has always been more, like I have wanted to hire people from seeing that”. (Kate, industry expert)

Lastly, interviewees suggested the need for a central repository that would display information about everything related to the creative technologies industry. This would be about

events happening around Auckland where they could participate and showcase their work, available or upcoming work opportunities, developments happening and the latest trends in the industry, among other things. An industry representative also mentioned that they are quite often unsure of the quality of the interns they get and had to go by the word of mouth of their references in academia and a platform that helped them assess the skills of the students would be desirable. The interviewees generally all agreed on the strategic importance of growing a more comprehensive student-industry interaction environment.

The Design of an Employability Agency

This Research-through-Design project is motivated by the perceived need for an evidence-based and innovative strategy designed to support students and graduates to locate and get jobs that set them up for career success in the Creative Technologies field. The research objective of creating a student led agency that would help BCT students get better work opportunities was undertaken through a collaborative design process that prioritised the involvement of participants. The findings of the analysis were processed to arrive at an actionable design. While these insights guide the design of the agency, these aren't final solutions, but rather pointers to synthesise ideas, before going back to the stakeholders to get their views. Their feedback would help us validate and/or make changes to the final designs proposals for the agency.

The insights derived from the interview data are presented here in two groups of three: first, three general observations that we inductively formulate from across the interviews, followed by more particular insights grouped by the three groups in our thematic analysis.

Although we initially imagined such type of an employability agency being driven by and for students, the interviews helped us discern a more intricate picture where roles, responsibilities, and tasks go beyond the capacities and field of action of students. Rather than such type of agency being *student-led*, the views and ideas from interviewees suggest that a comprehensive strategy led by people in a variety of contexts is more conducive to prepare students locate, apply, and get jobs where they can demonstrate their preparedness for transdisciplinary work. Namely, industry experts expressed their preference to seeing more specific instances of student involvement such as in the running of showcasing and hands-on industry events at AUT. Industry experts identified situations where students can demonstrate their skills and dispositions as necessary, but only as part of a larger picture of academia-industry partnerships. In addition, all the interviewees felt that having students drive the agency would

be too taxing on those who already have a fair share of load in terms of studies, part-time work, etc.

A second general insight from across interviews highlighted the need for systemic initiatives, and the importance of assessing their short and long-term impacts. The work required to connect students and recent graduates with adequate employment opportunities could be distributed among existing entities inside and outside AUT. Some interviewees further pointed to the need for a dedicated team that coordinates and documents a range of ongoing and future activities to garner best results. Periodic monitoring of these initiatives by establishing a feedback system to reassess their effectiveness would prevent the Agency from losing its effectiveness over time.

And the third general insight would be synchronizing employment and entrepreneurial activities with the academic calendar of the students to make them most effective. This is primarily because students have their thought processes aligned to their university schedule of semesters. Therefore, the planning around this work should be based on an annual academic plan with a semester-wise focus. Additionally, since the current annual showcase, which is a large and prominent event, is held at the end of the second semester in November, the Agency would do best to work around its established timeline.

Actionable insights related to Theme 1: The interview data revealed a number of ongoing opportunities that interviewees recommend be more explicitly acknowledged, explored, and utilised. This theme asks for focused initiatives to identify such opportunities and measure their value. It also guides future employability strategies to aid students and recent graduates make informed decisions about pursuing them. The agency needs to work explicitly to identify such opportunities.

Based on this theme, the agency would first go about identifying specific companies and qualify the availability of opportunities there. Simultaneously it would interact with students and recent graduates and inform them about the value addition mentorship would bring in and about the long-term benefits of landing in transdisciplinary roles as against mono-disciplinary roles. It would highlight to the students the pros and cons of working at start-ups or larger companies. It would also guide the students on how to make the best of mono-disciplinary roles and the importance of realising the value addition they would undergo in transdisciplinary roles and discuss strategies about how to morph those positions they might land into, into positions with CT-relevant responsibilities.

Another aspect for the agency would be to explore internships primarily, but not confined to being 'Project-based' and work with the BCT leadership at the university to explore and evaluate them. The Agency would also work with them to bridge entrepreneurial thinking to entrepreneurial action by both identifying more AUT-industry partnerships and seeking internal changes within the program that would bring about this.

Actionable insights related to Theme 2: Akin all university graduates in general, an overall improvement is seen as required to improve the professional skills of BCT graduates. An action plan around this would require tweaking the curricular and extra-curricular orientations of the BCT to incorporate such training requirements. The plan could involve learning outcomes and sessions to develop each of these skills. The plan could also attempt to get students involved in participating, conducting and running some of the events for and with industry.

Based on this theme, the agency would interact with students to highlight the importance of collaborative, problem-solving and professional skills. It would attempt to assess the skills that students need to improve upon and address these by either guiding students to existing avenues to self-improve on these skills or work with them and the BCT leadership to develop a schedule of activities, spread across the students' semester, to develop each of these skills. The agency would also attempt to get students involved in participating, conducting and running some of these events.

Actionable insights related to Theme 3: The theme focuses on the need for an improved student-industry interaction. The agency needs to work closely with the university, students, graduates and industry experts. Aspects that need work include the university's engagement program with smaller to medium sized companies, the need to finding and creating new 'allies' in the industry, the current annual showcase, introducing new events fostering high student-industry interaction and creating a central repository to act as an information centre both for the students and the industry. For this the agency would need to incorporate changes in existing processes and events.

Based on this theme, the agency could go out and identify and meet champions of creative technologies and nurture strong relations with them. The agency would reach out to these allies in future to develop stronger industry relations. It would also identify and work with smaller to medium sized companies and seek relevant employability and internship opportunities at these organizations. The agency would also work with the BCT leadership to inquire if a restructuring of the annual showcase could be a possibility, and if such an opportunity arises, work on the duration, content, and audience. The Agency could also work with them to

revive high student-industry interaction events like hackathons, meet-ups and panel discussions, some led by students. These events are highly recommended by interviewees and were held at the university but have since been discontinued, probably due to a lack of effective feedback from the industry. It would also work to create a central repository which would collectively over time, try to accommodate all the information about events, companies and other relevant opportunities for students. The central repository would also, over time, try and accommodate specific student related information, including their strength in different domains, details of their current and previous projects and the kind of projects they would be interested to be a part of in future, and if possible, recommendations and feedbacks about them from their peers and professors. This would help the agency over time to work with industry and students to connect them.

Discussion

This research grew out of a perception that transdisciplinary Creative Technologies graduates were landing up with work opportunities that were not to their satisfaction or which did not utilise their skillsets completely. This motivated a design-oriented project inquiry into understanding the issues around employability in this context. A Research-through-Design approach was undertaken to create an artefact, an 'Employability Agency', to explore the issues and ideas to improve the situation in future. Interviews were conducted with stakeholders and the interview data helped identify inductively actionable insights to design an employability agency.

The topic of this research elicited unexpectedly high interest from a range of stakeholders who play a range of roles and have different agendas and priorities. The topic also highlighted the sense of urgency and anxiety that students and recent graduates have in terms of finding the right work opportunities. Arguably the main result of this study was related to the lack of awareness about existing initiatives and opportunities that go unaddressed, or whose value is not sufficiently appreciated. Beyond the student showcase, in the past more interactive events were organised by the BCT including hackathons and meet-ups. Their non-continuance could be explained to a lack of understanding of the value they carry for students and graduates. It is therefore highly pertinent for the creative technologies school and the university in general to be taking feedback from industry and other involved stakeholders.

This study also brought forth the idea about how certain ongoing initiatives such as internships, entrepreneurship and the university's engagement policies with companies could be relooked at to make them more relevant for all involved. It is important for the university to

refine existing platforms to enhance their relevance over time. Further research to inform this would be an interesting area to explore.

While this study examined the employability of students and recent graduates of one program at a particular university, this research fits into a more general space. The development of employability as an agenda to be included in the graduate academic program is an area of existing research (Harvey, 2000). What fuels research in this space is the perception of students and recent graduates about them being industry ready (typically informed by an inadequately collected feedback from industry about what exactly the industry needs) and the argued gap between the capabilities of the graduate and the competency levels expected in industry (Almi et al., 2011).

This study has thrown up some very pertinent questions for future work. Research to create an Agency that looked at such questions for an entire university would be an interesting inquiry. The study here could be a precursor to work in researching whether universities should work more closely and collaboratively with involved stakeholders to design a feedback system that would help them evolve their systems and policies at a rate demanded by industry and other stakeholders. It would be interesting to see what results such inquiries would generate. With industry looking for people who have a problem-solving attitude and who are great at collaborative work, should the universities emphasise special focus on developing such skills. Could these be taught as part of a program to students, and if it could be, figuring out what would be the benefits of such learning, would be an interesting area to explore. With the Creative Technologies graduates affirming that the pedagogy at the university inspires them to look at themselves as entrepreneurs, the university could invest more resources to help these students learn and develop other related skills that would make them conceptually stronger as aspiring entrepreneurs.

Given the increasing uptake of online and remote learning modes due to the Covid-19 pandemic, a disruption in the medium of physical information exchange was a highly expected eventuality. With norms of physical distancing and social distancing being incorporated across the globe, the modus operandi of sharing knowledge in groups would always have needed a relook. Especially given the fact that the modes and remote learning platforms available beyond the university had already made impact by providing industry recognised knowledge and certifications over the last decade. A disruption like the pandemic further aids their cause. It appears therefore, that the universities need to relook at their value propositions and modulate their processes to be concurrent with the changing demands.

Insights from our research suggests the university needs to work closely with stakeholders to make the most of existing untapped opportunities and restructure processes to align with changing demands in industry. Future research to inquiry into the specifics of how the universities can adapt could dictate changes to their knowledge imparting processes.

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Chapter 3: Closing Chapter

The closing chapter opens with a more detailed discussion of the insights derived from the findings of the interview data. It then describes a design process where these insights are used to inform the ideation of a solution, which we term as the 'Employability Agency' of just agency for simplicity. The chapter then continues to formulate strategies to prototype and evaluate these solutions. It also presents reflections on the research and design processes and how they contribute to tackling the goals of this project. Connections to the literature and future work, close the chapter and the thesis.

Themes

For analysing the data collected from the interviews, thematic analysis was carried out through a six-phase analytic process (Terry et al., 2017). This involved familiarization with the data, which was followed by creating codes which were then grouped and reviewed and shaped eventually into themes. While reviewing the grouped codes, multiple ideas started materializing, which would later take shape into more cohesive themes. Some of the major early code groups were about what the university needs to do, what industry experts expect from a BCT graduate and the existing gap between these expectations and the capabilities of the graduate. Additional insights were about existing student-industry engagement platforms and what could be done about them, and action areas about what more could be done to inform industry professionals about the transdisciplinary skillsets of the BCT graduates. These ideas, were iteratively combined, divided, and connected to finally merge into three important themes that capture the essence of all these ideas. The three main themes discussed in detail below in the Results section are:

Theme 1 – Unexplored existing opportunities:

The first important theme was about opportunities that are already available in the creative technologies' domain. These findings draw attention to what already exists, provide evidence of its value, and suggest ways to make the best of it.

Theme 2 – Upskilling the Graduate's 'Employability Skills'

The second important theme was regarding the need to upskill the BCT graduates in skills that matter from an employability perspective. Collaborative and problem-solving skills, and professional work skills were the main areas of improvement for students to have an effective transition to the work environment. Professional work skills included communication skills, soft skills with an emphasis on basic work etiquettes, and networking skills.

Theme 3 – Developing Student-industry interaction platforms

The third important theme was the need for improving contemporary and aiding newer platforms for student-industry interactions. These include pathways for improving aspects of existing events and processes, as well as creating new avenues and systems for students and industry personnel to interact. The university is seen to have a major role to advance these ideas.

While on one hand these themes help shape the employability agency, they also reflect a synthesis of the existing literature in related fields. Multiple aspects that came out of the data analysis were in sync with existing research in related fields. The literature survey undertaken for the research, had a large imprint on the insights drawn from the data. The ‘future of work’ had imprints on the upskilling needs for the graduates, ‘employability’ on the role of the university and students in the creation and need for a stronger student-industry interaction platform and ‘work-integrated learning’ on internships and mentorships.

To highlight on the above points, the literature on ‘future of work’ was suggestive of the students lacking in soft skills. It also reflected the dissatisfaction of jobseekers on not having their skills completely utilised at work and of jobs not utilising their skills (Manyika, 2017). Both these points were reflected for the BCT students. Industry representatives expressed the view that while these students are excellent in their trade but could use some upskilling in terms of soft/professional skills. To quote an industry expert:

“The other (skill) would be professionalism, all round professionalism which may sound like very basic things but we get internships, and every year rolling internships and these skills are very lacking in everyone we get in, or most people we get in”. (Kate, industry expert)

These graduates were also found to be unsatisfied with the roles they end up in industry, primarily due to underutilization of their skills. To quote a student:

“If I am going for a certain role I would still be very disappointed in myself because I have spent so much time and effort doing this and that and when I move out of it, I will get a job where I am only doing this. So, all those other efforts that I put into it for my course I paid for, I would be disappointed. Yes, and I don’t want to go out looking for a job that has this one position.”. (Samantha, BCT student)

The experiences of transdisciplinary BCT students seems to be a reflection of the changes expected in the ‘future of work’. It is also an indication that education systems might need to adapt to be better prepared for a changing workplace environment and could require bringing about changes to modes and platforms of knowledge delivery (Peters, 2017).

The insights also highlighted the need for a higher involvement from both the university and the students to create better structures for employability. The literature on employability broadly suggested the industry, the university and the individual as three aspects involved and affecting the individual's employability. As part of our interviews the industry professionals expressed similar expectations, that the individuals need to put more efforts in an effort to join the industry. To quote an industry expert:

"The onus is on whoever is trying to get into the industry to work themselves up and network and talk to people." (Jack, industry expert)

Simultaneously, the university was expected to play a bigger role in creating constructive environments to aid the process of getting better work opportunities. To quote an alumni, who had since become an entrepreneur:

"I think in the context of the BCT, a lot of organizations that are smaller in nature that are sort of better suited to connect to BCT students, that sort of don't have the capacity to engage AUT for internship programs. like the smaller sort of start-ups or sort of not start-ups but just beyond that, coz I know it can be quite daunting to engage AUT. (And I am) just speaking of an easier process and being maybe a little bit more open to sort of the companies that engage with, coz that they do have the big books (companies)" (Abel, recent graduate, entrepreneur)

The insights relating to internships and mentorships had reflections of the literature on work-integrated learning. High significance was attached to internships, by all the stakeholders. One industry representative even went ahead to mention that the current model might need a relook since internships are so critical for students and they give students an exposure to work life before they graduate. Internships focused around the entire project lifecycle could be one possible solution. These ideas were accompanied by insights to optimise aspects such as internships being monitored to maximise its value and being project-based to specifically suit the working pattern of the BCT students. This is a strong reflection in the existing literature on the exposure to work environments, for students, while studying at the university. To that extent mentorship for students could also be a kind of exposure to work environments while studying. Speaking about the value addition of internships to students, one industry expert detailed about the multiple benefits to students such as, time management, resource management, collaborative skills, responsibility, etc. To quoted him:

"Internships, give a really good idea of how the company runs, and that's something you don't get with just normal academia. Time management, resource management especially in terms of money and everything like that. A lot of students forget that there's money involved in these things and everything like that the time in terms of deadlines. Yes, you get that to an extent doing studying and things like that, but also other people are relying on you to deliver these things. And it's often not just external clients or anything like that, its internal people who are waiting on you to finish stuff. Often these things are run in sort of the agile style where you have

got a whole list of action points to complete in a set amount of time and after somethings are held up because somebody hasn't finished something off. So definitely gets that collaborative team building skills and then that maybe you get in group projects and stuff at uni, but it's a very different way of working I find. And then the other side of that would be just personal skills. You are often working under someone which you don't get in university unless there's a research paper or a professor who is running a summer internship or something like that so you are understanding that dynamic and your responsibility to that, is really important. I get a lot of people who are like, they don't turn up on time or whatever else also, you know – that responsibility of working and sticking to the job” (Jack, industry expert)

An Employability Agency

The insights from the themes guide the design of the ‘Employability Agency’ (or simply agency). They aren’t final solutions, but rather pointers to synthesise ideas, much akin to the ideation stage of Design Thinking (DT). The ideation stage is where the ideas are synthesised to potentially inspire newer, better ideas from which the best, practical and innovative ones could be further worked upon (Tschimmel, 2012). It’s a stage which uses creativity and innovation to find better, more elegant and satisfying ways of solving the problem at hand. It works to integrate multiple stakeholders’ views towards the creation of sustainable propositions (Geissdoerfer et al., 2016).

The concept of an ‘Employability Agency’ helps to articulate and apply the results of the interviews through a design process that recognises and extends the ideas and suggestions given by the interviewees. The findings of the interviews were processed and interpreted to translate them into actionable ideas. These insights inform the design of the agency. This was shared with a subset of the interviewees as well as some new stakeholders in order to capture their feedback on the proposed solutions. In this section we note how such agency would solve the various issues unearthed during the research process and discuss the feedback received in relation to future work.

An independent entity

The research started with the goal to help the BCT graduates find better work opportunities in Creative Technologies. Initially, the emphasis was almost entirely on problems and solutions related to students. Namely, in the early stages of this project a preliminary solution was conceived around ‘student-led’ initiatives. However, the interviews helped the researchers ascertain that the roles and responsibilities go beyond the capacities and field of action of the students and graduates. Rather than solutions being *student-led*, the views and ideas from interviewees suggest that a comprehensive strategy led by people in a variety of contexts is more conducive to prepare graduates, industry, and the university to grow the conditions where job opportunities exist where transdisciplinary work is valued.

The modus operandi of the agency maintains the students and recent graduates at the centre of all its efforts, but it needs to encompass all stakeholders involved. Therefore, synchronizing agendas, schedules, and practices across stakeholders is desirable, such as employment and entrepreneurial activities with the academic calendar of the university with a semester-wise focus.

The piloting stages at the start of this research project exposed the wide range of stakeholders that the agency would have. Such agency would have to work in unison with all stakeholders and be a platform well aligned to students, industry members, and academics. Four main stakeholders were identified, and further broken down into subsects. The agency would have to work closely with each of these so as to be relevant to all of them. The university (the leadership, administration and teaching teams), students, BCT alumni, and industry representatives are the major stakeholders. Briefed below are these stakeholders and the relationship each would share with the agency.

- a) The University: For an Employability Agency to be effective, it would need to be functionally independent from the university and from industry. Since the Agency's objective is helping BCT graduates find better work opportunities, it needs to work in unison with the university, especially with those functions which directly affect the employability skills of the BCT students i.e. the leadership and teaching teams). All changes suggested to the existing student-industry interaction avenues and towards creating newer avenues would ultimately be implemented by the university. Therefore, an Agency would work closely with the leadership team to discuss feasibility of such changes and for an exchange of views of how to best implement them. Additionally, it would coordinate with the administration team, teaching teams and other relevant teams to help implement all such changes as mutually decided.
- b) Students: The key goal of an agency would be to help BCT students develop suitable profiles to find better job opportunities. They, therefore, are the most important stakeholder. The research suggests that the agency's priority is to identify unexplored avenues, upskill the students, and create better student-industry interaction platforms for them while constantly taking feedback from the students. A suitable strategy therefore would be to divide efforts between the final year students who are expected to graduate and join industry shortly, and the rest of the students. This is primarily due to the higher perceived importance of employability related activities for the students who are close to graduate.

- c) Alumni: The BCT alumni includes both recent graduates and other such graduates who have over the years developed as industry experts. The recent graduates would benefit from the agency's activities in similar fashion as the final year BCT students. The alumni who have blended into industry over the years could be reached out to share their expertise and experience of working in the industry and eventually help the agency build a better bigger industry network and reach out to more professionals in the industry. The agency could be a platform for transitioning recent alumni from seeking opportunities to leveraging and creating opportunities for younger alumni in the long run.
- d) Industry representatives: The agency would need to work very closely with the industry representatives to identify better work opportunities for the BCT students and recent graduates. The agency could be the primary contact point for the industry in the look-out for graduates for internships or work opportunities. The agency would need to work with companies which work in the Creative Technologies domain and are focused at creating content for their own consumption or for clients, who are not experts in this field. The agency would also work with companies whose core competency is not creative technologies but have a function/team that works in this domain to resolve specific problems.

The research also helped identify that there could be other external stakeholders in the future. The agency might need to collaborate for such work as designing physical or digital content, training, etc. With the research emphasising on the need to develop entrepreneurial environments for the students, organizations which help foster ideas would also become important stakeholders for the agency in future. Training to upskill the graduates is one of the important themes. The trainers whether individuals or organizations would also be an important stakeholder for the agency. Organizations such as 'GridAkl' (<https://gridakl.com/>), 'Auckland Live' (<https://www.aucklandlive.co.nz/>) which act as or assist platforms in organising events focussed on creative technologies could be other important stakeholders in the future. These are all partners with whom the agency would need to coordinate to achieve its objectives.

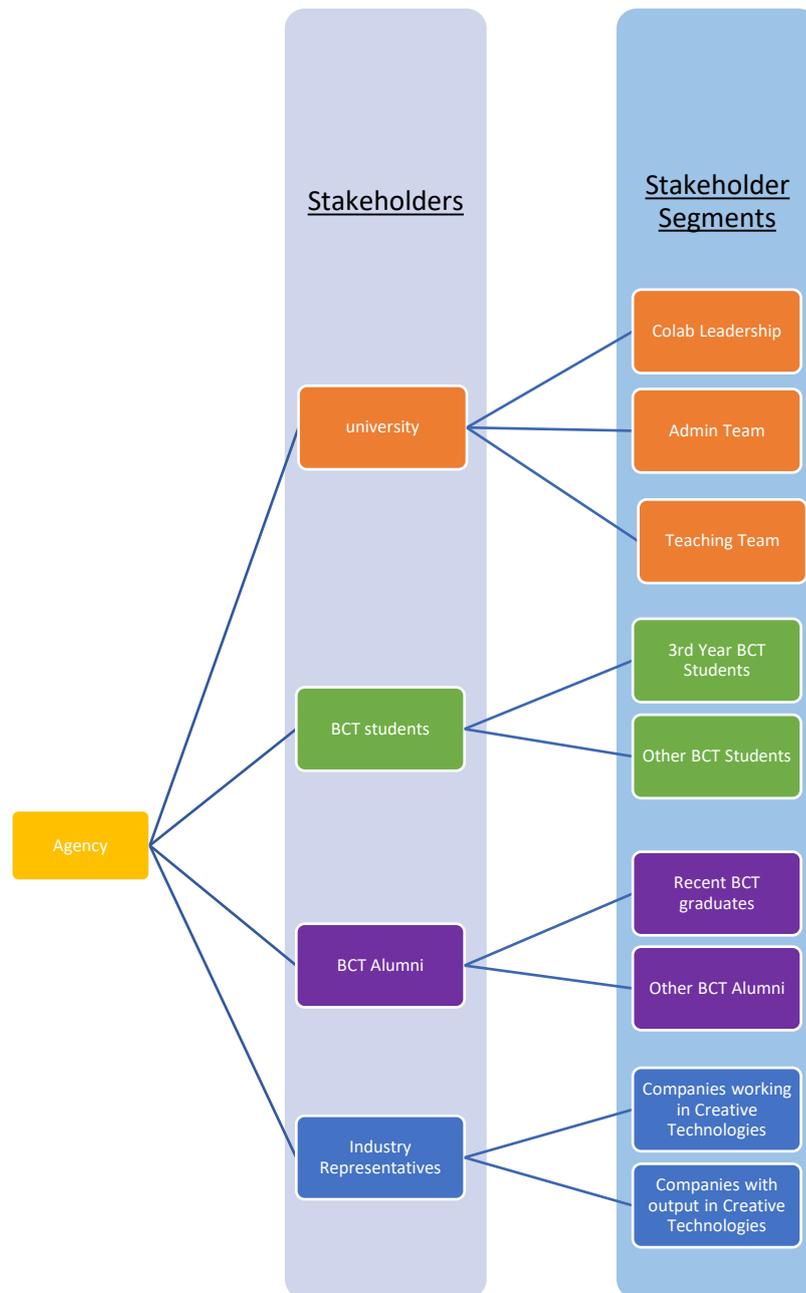


Figure 3.1. Stakeholders of the Agency.

The insights from the data analysed helped design pathways which could work towards creating better work opportunities for the BCT students and graduates. These pathways attempt to resolve the multiple aspects discovered in the research process.

Pathways to bridge 'Unexplored Existing Opportunities'

The insights from the analysis of the interviews reveal a number of ongoing opportunities that participants suggested need to be more explicitly acknowledged, explored, and improved. This asks for new and ongoing initiatives by the agency to identify such opportunities and measure their value. It also guides future employability strategies to aid

students and recent graduates make informed decisions about pursuing them. The agency could make an ongoing effort to identify such opportunities. Some of the opportunities mentioned directly or indirectly in our research include:

- a. Setting up channels for interaction with students in order to:
 - a. Highlight the benefits of work opportunities that provide a scope for mentorship
 - b. Highlight to the students the benefits of internships

- b. Identifying such work opportunities which:
 - a. Provide mentorships and access to mentors to students
 - b. Certify as 'project-based internships'

- c. Bridge entrepreneurial thinking to entrepreneurial action by:
 - a. Identifying more AUT-industry partnerships and
 - b. Seeking what changes internally within the program would bring about this.

The interactions with the students to highlight the benefits of 'mentorship at the workplace' and 'project-based internships' can be addressed by organising a series of interaction sessions with the students. The research exposed the aspect that industry representatives were keen on identifying, working with and investing resources in developing graduates who would take initiatives, have a problem-solving attitude and were backed by a good portfolio. The students at their end need to work on these aspects. The agency could accentuate these aspects to the students in the interactions with them and also work with them to develop these. The agency, given its periodic interactions with the industry, could request them for such opportunities for the students.

It could create a network of the alumni of the creative technologies program. Having gone through a similar transition and having faced similar challenges in the early days of their careers these individuals could be expected to be more empathetic to the graduates and therefore more outgoing in an effort to help them. This network could be used in at least two primary ways. First these alumni could be inquired about whether they could themselves be mentors for the students and recently passed graduates. Second, they could be used as a platform to increase the reach of the agency to look for opportunities for mentorship at work in industry.

Additionally, a simulation of mentorship as part of the BCT learning experience could aid students understand the value of mentorships. Senior third year students or honours students could be inquired if they would want to volunteer as mentors for the first/second year students for short consultations (say for a couple of hours on a weekly basis). With their knowledge and expertise, they could guide the junior students to understand and look at aspects of the problems from a new perspective and upgrade the quality of their work, in the process improving their learning process.

A similar exercise could also be done by the agency for the third-year students. It could inquire with industry professionals/senior BCT alumni if they could volunteer as mentors for the final studio projects of the students. The experience would help the students appreciate the value of mentorship at work and motivate them to seek work where they could grow under expert mentors.

The agency could work to identify companies that provide 'mentorship at work' opportunities and to promote more mentorship opportunities in companies and outside companies. For this it could reach out to organizations which provide mentorship opportunities in the creative technologies or entrepreneurship/business domain. For example, Cultivate Lab (<http://www.cultivatelab.nz>) and Tech Women NZ (<https://techwomen.nz>) are organizations with a specific focus on mentoring women and helping them grow in workplaces. These or similar organizations could be reached out to chalk mentorship plans for the female students. Hire BIPOC (<https://www.hirebipoc.ca/>) works to provide opportunities for Canadian BIPOC creatives in screen-based industries. Other platforms such as eMentorConnect.com (<https://ementorconnect.com>) could provide with online programs that could suit the mentoring needs of the students. The agency could inquire to identify more such organizations.

Similarly, the agency could work to identify companies that provide 'project-based internships' opportunities and also to promote more internships that qualify as 'project-based', by working closely with existing industry partners, industry allies, and through the new industry partners identified through the extensive student-industry interaction platforms the Agency will be working on. Platforms such as 'GridAkl' (<https://gridakl.com/>), 'Auckland Live' (<https://www.aucklandlive.co.nz/>), and 'Festival of Lights' (<https://www.festivaloflights.nz/>) which act as or assist platforms in organising events focussed on creative technologies could be reached out to inquire about internships opportunities for the students. These events perfectly fit the definition of a project. These opportunities could in the long run be communicated to the students through a 'Central Repository' that the agency could work to create. Platforms

supporting the 'gig economy' model, such as 'upwork' (<https://www.upwork.com>), 'fiverr' (<https://www.fiverr.com/>) and 'unicornfactory' (<https://www.unicornfactory.nz>) have a large base of freelancers working in various fields including the creative technologies. The agency could reach out to them and inquire if they would be interested in either mentoring the students or even taking them up as interns under them. Working in such projects with these experts of their fields would simulate a 'project-based internship' environment for the students. The students could also be motivated to inquire from the freelancers about projects they could associate with them on.

The analysis of the data demonstrated a high propensity of the BCT students to entrepreneurship. The agency would, therefore, need to actively work with the multiple stakeholders to mould and guide the students' entrepreneurial thinking into actionable endeavour. For this it should have a two-pronged approach, one looking at what the agency could do internally within the university system, and the other looking at changes or associations the agency could build up externally outside the university.

Internally the agency could coordinate with the BCT leadership and discuss the aspect of introducing an 'Entrepreneurship' elective for the BCT students. The feasibility of starting 'Entrepreneurship related workshops' conducted by industry experts or BCT alumni, could also be discussed with them. Another approach for the agency could be to look at the Entrepreneurship club at the university (AUTEIC) and the CO.STARTERS programme (<https://www.aut.ac.nz/student-life/clubs-and-activities/co.starters@aut>) at AUT. The club should be explained the background of the BCT students and briefed about creative technologies. The agency could then ask them to reach out to relevant industry experts in their large network who could be invited as speakers for the BCT students. The agency in collaboration with the club, could also explore the idea of conducting panel discussions and workshops with the industry professionals. The agenda for these discussions and workshops should be entrepreneurship driven and should be a mix of topics specific to the creative technologies domain and general strategies towards starting a venture.

CO.STARTERS at AUT is a 10 week programme that gives aspiring entrepreneurs the insights, relationships and tools they need to take their business ideas further. Here too after explaining the background of the BCT students and briefing about creative technologies, the agency could discuss with them the possibility of creating a specific programme tailored for the transdisciplinary skilled BCT students. The CO.STARTERS programme involves creating a company pitch and culminates in the last week by pitching the business idea to program

members and possible venture capitalists. This could be a great platform for the BCT students to shape their ideas to reality.

Externally, the agency could inquire into its industry network and arrange to conduct some of the same activities that it planned to conduct with the Entrepreneurship club. It could organise speaker sessions, panel discussions and workshops with entrepreneurs and with experienced freelancers. Additionally, the agency could invite BCT alumni, who had started their own venture, for speaker sessions, panel discussions and workshops. These sessions would give practical insights to the students and would be a great opportunity to network with their alumni. They would also give an opportunity to the BCT students to learn those aspects of starting a venture which could potentially make a difference to their capability of succeeding at it eventually.

Pathways to develop 'Employability Skills'

As discussed in the manuscript and then again briefly under the themes section of this chapter, the analysis of the interview data identified a variety of skills that students need to acquire, develop or sharpen for a more effective transition to the work environment. The BCT graduates need to sharpen their collaborative and problem-solving skills and improve their professional work skills. Professional work skills were further trifurcated into communication skills, soft skills with an emphasis on basic work etiquettes, and networking skills. The industry experts expressed an expectation for a certain level of professionalism from the BCT graduates who come to work with them.

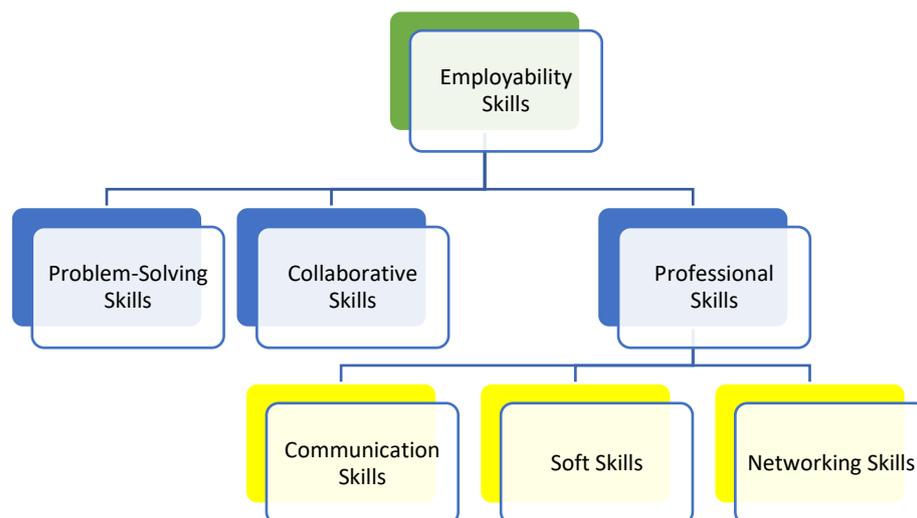


Figure 3.2. Employability Skills highlighted in Theme 2.

The first prerogative for the agency should be highlighting the importance of these skills to the students. The agency should conduct sessions with the BCT students at the start of the

semester session to expound the importance and need of these skills. Industry experts could also be called to take these sessions. The agency should then take a feedback from the students to understand the level of interest they have in acquiring these skills. The feedback would help the agency to analyse which students want what specific skill developed.

To develop problem-solving skills, the agency could introduce industry driven workshops or speaker sessions. BCT alumni and other industry experts could be called in for these sessions. Additionally, organizations such as 'Institute of management New Zealand' and The 'Education Gazette' from the ministry of Education have problem-solving sessions and courses namely <https://www.imnz.co.nz/events/181-problem-solving-decision-making/> and <https://gazette.education.govt.nz/notices/1HA5Wr-future-problem-solving-nz-training-workshop/>. The agency could inquire about these and other such workshops that would benefit the students. And organize such sessions for the BCT students. The agency could also discuss the need of developing the problem-solving skills with the Colab leadership and see if such workshops could be incorporated in the existing courses/electives or to the studio experience of the students, preferably in the early years.

Working in collaboration with teams to improve the overall productivity was deemed very important by the industry representatives. Also, due to the effect of COVID-19 pandemic, teaching has had to move online to quite an extent, thereby reducing the opportunities for students to work with each other in shared physical spaces in collaboration. In fact, the opportunity to work with other individuals and to learn from them in teams, in the same shared physical space is one of the major takeaways from university education, not provided by online learning platforms. The agency needs to highlight this to the leadership teams at the university and work with them to create a plan towards its development.

To improve the effectiveness of the graduates at this the agency should, again, first reach out to the students and highlight them the importance of such work. This could be done in the same sessions as for highlighting the importance of problem-solving. In this case as well, industry experts in this field could be called in to take these sessions accompanied by a workshop to emphasise the importance of collaborative skills. The ministry of education has several programs to build collaborative skills, both for students (before they enter tertiary education) as well as for their teachers. Some of these are <https://www.education.govt.nz/assets/Documents/col/Development-map-Version-3.pdf> , <https://elearning.tki.org.nz/Teaching/Innovative-learning-environments/Collaborative-teaching> and <https://www.ero.govt.nz/assets/Uploads/Collaboration-to-Improve-Learner->

[Outcomes.pdf](#) . Private organizations such as 'theeducationhub.org.nz' also work in this domain (<http://theeducationhub.org.nz/wp-content/uploads/2019/08/ILE-and-Collaborative-Teaching.pdf>). The agency could try and connect with them to see if a program specially suiting tertiary BCT students could be created.

Other existing programs such as <https://www.businesslab.co.nz/>'s training workshops on collaboration or <https://www.creativityatwork.com/collaboration-workshops/amp/> , a workshop by creativityatwork.com, which brings a multi-disciplinary approach to learning and development could be checked out. They could be reached out to chalk a plan to help the BCT students develop their collaborative skills.

Towards developing the professional skills of the students, the agency would again have a similar approach. It would again reach out to the students and highlight them the importance of these skills in the same sessions highlighting the importance of problem-solving. Here too, industry experts from this field could be called in to take these sessions accompanied by a workshop to emphasise the importance of the professional skills. The agency could also find out about sessions conducted in the university itself for developing professional skills. The BCT students could be guided to attend these. Outside the university there are multiple private organizations which provide sessions and workshops to develop these skills. The agency could reach out to them and organise sessions for the students.

Additionally, the agency could discuss with the leadership teams at Colab to see if professional development could be given more emphasis in the existing courses of the students. The studio sessions could include sessions where the students are informed about the importance of communicating their ideas better and what changes to bring in to improve their efforts. Underscoring the importance of these skills in their work environment will help them to appreciate their importance better. Similarly, the importance of networking should be highlighted at all the sessions organised by the agency. The students should be motivated to reach out and talk to and discuss their ideas and inquire about what the invitees at the sessions and workshops are working on. The students could also be informed about online courses available through the resources provided by the university, which help develop soft skills. This would allow them to learn and improve at their own pace. The agency should attempt to keep the students informed about other networking events happening in and around the university or at other universities.

The agency should also attempt to get students involved in participating, conducting and running some of these events. This resonates with the view expressed by the industry

representatives that they would want students to run the events, as such experiences simulate an actual working experience like in a project or in a company, where they have to manage multiple aspects to get a particular job done. For all the programs, activities, sessions planned should have a strong feedback mechanism from the students to understand their effectiveness and acceptance. Basis such feedback, the program could be modified to include other aspects as might deem important. At the end of each semester the agency could work to re-evaluate the feedbacks received over the semester. It should try and reach out to as many stakeholders as possible to discuss this and reformulate the scheme of things for the upcoming semester.

Pathways to develop student-industry interaction platforms.

The analysis of the data highlighted multiple actionable insights for the agency towards developing an improved student-industry interaction. The research informs that the agency needs to work closely with the university, students, graduates and industry experts. The student-industry interactions have to be at multiple platforms and these interactions will be the opportunities for the BCT graduates to exhibit their transdisciplinary skills to people both from the industry and outsiders.

The interviewees broadly highlighted that the agency should attempt to achieve these interactions across six different platforms. Some of these like the Annual showcase, internships, etc already exist and should be reformed to improve the student industry interaction, while some like the central repository would be new platforms created for improved interactions. Each of these platforms are discussed below with emphasis on what pathways the agency should undertake to transform or build them. Also, these pathways are not in silos and could help resolve issues across one or more aspects at the same time.

1) Annual Showcase:

The current 'Annual Showcase' is highly appreciated by industry representatives and graduates alike. The current showcase is an annual two-hour event held after the end of the semester in November. Students from each year exhibit their work in the studio space for Creative Technologies. Students and graduates as well as industry experts all believe it is the great platform to exhibit the skillset and craftsmanship of the BCT graduates. It is also the biggest platform to influence the perspectives of industry professionals about the skills of the Creative Technologies graduates. At the same time, there were multiple suggestions about how it could be transformed to make it more effective, visible and popular.

Basis the insights from the analysis of the data following aspects of the Showcase could be considered for review or changes.

- i) *Duration* – All interviewees, whether industry representatives or graduates or students, felt the current timeframe of 2 hours of the annual showcase is not enough. As a graduate had expressed that since everyone had to ‘cram their stuff into the same space’, thereby ‘losing heaps of punch’. The visiting audience therefore does not have the time to give the students’ work, the appreciation it deserves. This timeframe does not give enough time to industry representatives to see all of the students’ work or to interact with the students and understand their process and ideas behind their work. A longer event should best suit the showcase. This way students also get enough time to talk about their work, people from the industry get enough time to interact and it also gives a larger time frame for industry people to come in and see the students work.
- ii) *Physical location* – All the graduates as well as some industry experts expressed a general sense of disappointment about the physical location of the Showcase. When inquired about what changes could be brought to the current showcase, multiple interviewees mentioned the inconvenience caused by the physical location of the showcase. Some interviewees shared the idea of hosting the event on the main floors of the building. The Feasibility of holding the showcase at another more mainstream venue should be explored by the agency.
- iii) *Industry representation* – A general feeling among the students and graduates is that the crowd that comes to the showcase, is not a true representation of the industry representatives from the Creative Technologies industry. Whilst there is a substantial representation of industry personnel, if the showcase were to be a larger event, a much higher involvement from the industry could be expected. Another aspect to explore could be keeping the students posted on which industry representatives are expected. This would help them be better prepared and network effectively as well. For this the agency could connect with more people from the industry and invite them to be part of the showcase. Such endeavours would need the agency to start work in much advance to the actual showcase event.
- iv) *Introduction of new activities to the showcase* – New activities could be introduced to the showcase to create a higher level of interaction both from the industry and students/graduates end. As suggested by the research ‘Panel Discussions’ and ‘Hackathons/game-jam’ appear to be most relevant and value-adding activities that could be added to the Showcase event.

- a. *Panel discussion* – Having a panel discussion right before the showcase is opened would give a great opportunity to the students to know some of the industry members present. One industry expert had suggested hosting a panel discussion and had spoken of the networking opportunities arising out of it at the showcase. At the panel discussions, students could question the industry experts and there could be a general round of discussion on topics relevant to the students as well as the industry body. The agency would need to interact with the industry experts and senior BCT graduates and organize the panel discussions.
- b. *Hackathons/game-jams* – Of the industry experts interviewed, half of them expressed the view that to see the Creative technologies students in action would create a greater impact on them. Hackathons would be a great way to exhibit the skills of the students. Hackathons are also a great platform to network, as was expressed by an industry representative, when he spoke of his student days. While hackathons could be held separately as an event, it would be a great opportunity to do so at the Showcase, due to the large number of industry representatives present there. The agency would work around the logistics of holding the hackathon/game-jam, which might have to be held simultaneously at the same time as the Showcase, due to time constrain.
- Apart from these, the feasibility of conducting other such elements could also be looked at by the agency in tandem with the other stakeholders.
- v) *Sponsorships* – Onboarding sponsors could help scale up the showcase. This could provide for food and catering options for the people coming to the showcase. For the sponsoring company, it could be an opportunity to showcase their brand. Companies would want to sponsor such events as it gives them an opportunity to stay involved with academia, identify, and eventually hire great graduates, increase their brand visibility across social media and create an overall better image of their company. The agency could be actively involved in identifying such companies and inquiring about such opportunities. Here again, it would need to start work on this much in advance. A separate plan to identify which companies to meet and inquire for sponsorship could be worked upon by the agency in tandem with the Colab leadership and BCT Alumnus.
- vi) *Scheduling a networking session* – The Showcase, with a large industry representation could be an ideal networking platform. For this either a separate

session could be organised, or the panel discussion could act as one. The important thing is to emphasise to the students to avail of the opportunity that the showcase would provide to network with industry representatives. With the agency already attempting to help students improve their networking skills as part of upskilling their employability skills, for the Showcase it could work with the students to make them ready in terms of having their business cards, being presentable, etc.

- vii) *Online platforms specific to the showcase* – Online platforms (webpage and multiple social media presence) specific to the showcase with content exhibiting previous years' work, student videos, industry representative reactions, and portfolios of the current as well as previous students work could be created to increase visibility and awareness. This content would be handy in sharing with industry representatives. Other content that could go up on this platform, could be discussed between the Agency and the concerned stakeholders.

2) *Other Events:*

Analysis of the data suggests, other planned events could primarily include *meetups, panel discussions, industry speaker sessions, hackathons*, or such other events (including industrial trips if possible) which could be planned over the course of an academic year and could create multiple platforms for industry representatives to see the work of BCT graduates closely. These events, depending on their nature and feasibility to organize them could be held separately or with other events, repeated multiple times or held once or twice over a semester or an academic year. The agency should have an active part in inviting the industry representatives to participate in these events. An annual agenda enlisting such events, with a tentative plan should be made at the start of an academic year. This could be communicated to students, graduates and industry members much in advance, for everyone to plan their availability for the events.

3) *Monitoring Internships:*

The research revealed that the effectiveness of current internships could be greatly enhanced if they were monitored, both at the university's end as well as at the industry's end. The internships could otherwise just be a sink hole for the student if they don't really learn anything. Alternatively, a student's casual approach towards the internship also prevents the company from wanting to hire interns from that university in future. Therefore, to avoid such situations, it is pertinent to have a mechanism for monitoring the work of the interns. The agency could keep a tab on the work and progress of the interns at the company, while also ensuring

that new opportunities that arise are communicated to the BCT students. This also ensures the companies about the quality of work they can expect from an intern.

4) *Exhibiting BCT work:*

While the Showcase is a great platform to exhibit the work of the BCT grads, it is in essence a one-off event, curtailed by time and space. A permanent platform for the same should go a long way to exhibit the skill levels of the BCT graduates. Such a platform would be great if it could at least have an online presence. An offline platform (a physical space) could be useful but would need planning to set up and could be confined due to space, cost and other logistical issues.

- i) Online Platforms:
 - a. A dedicated webpage for Creative Technologies. The content on the page could include the following among other things.
 - i. Alumni interviews, showcasing their expertise and achievements and current areas of work.
 - ii. Video content of previous showcases.
 - iii. Video content of labs and how students work there.
 - iv. Video portfolio of some of/all the students and their work
 - v. Video content with industry feedback
 - b. Social media presence. The research recommends that presence on social media platforms for a transdisciplinary Creative Technologies program is quintessential. This could therefore involve.
 - i. Dedicated Social media presence across platforms like Facebook, Instagram, Twitter at least.
 - ii. Active account with high engagement and proactively reaching out and connecting with relevant industry people, alumni and students.
 - iii. Use the platform to exhibit latest developments happening at BCT, by BCT alumni or any other relevant content.
 - c. Have a portfolio of the work of the students (video/pdf) that can be shared with industry representatives.
- ii) Offline:
 - a. Portfolio – Could have a physical copy of the portfolio of the students.
 - b. A physical space to exhibit the work of the students.

The Agency would be greatly involved in making this platform popular and in increasing its reach. Each social media platform should have a plan of how to make it popular, what content to share to increase its reach, etc.

5) *University engagement programs – with smaller companies and freelancers*

The university's engagement program would need a two-pronged approach with equal focus on maintaining existing relations and identifying and establishing new relations. Especially with smaller companies and freelancers specifically because transdisciplinary creative technologists are highly entrepreneurial. The research data also suggested that smaller companies could provide opportunities for the BCT students in terms of internships or even work-related opportunities. The research also indicates that these organizations find it rather daunting to reach out to the university. The agency could act as an intermediary in such a scenario. The agency which would already be striving to create a larger, stronger network within the Creative Technologies industry, could additionally look out for smaller companies which are dabbling with the idea to reach out to the university to hire interns or for resources to join them for long term work opportunities. The agency thus, could identify smaller companies or freelancers who could work with the BCT graduates.

Here the agency would also require identifying, connecting and strengthening relations with people who champion the cause of Creative Technologies. These people or 'Allies' as they could be referred to, would work with the university and their networks to promote talented creative technologists.

6) *Central Repository:*

The graduates interviewed expressed the view that there existed a need for a platform where they could go to find out about existing opportunities in the creative technologies field. This would have information about events where they could participate and showcase their work, available or upcoming work opportunities, developments in creative technologies and the latest trends in the industry.

The agency could take lead in establishing such a platform which could act as a central repository of existing opportunities for the students. With the agency creating a strong network and by being actively present in the Creative Technologies industry, it could be up to date with everything that the industry has to offer. This repository could be an off-line platform where any upcoming opportunity could be communicated to the students. Over time, this could take shape of an online platform, internally available for the students to look at opportunities and apply.

The students would be able to showcase their work-related strengths when they apply, so that its easier for the agency or the company to shortlist the students to work with the company.

Insights from the data also indicate that industry representatives are quite often unsure of the quality of the interns they get and have had to go by the word of mouth of their references in academia. The central repository could also therefore, over time, try and accommodate specific student related information, including their strength in different domains, details of their current and previous projects and the kind of projects they would be interested to be a part of in future, and possibly recommendations and feedbacks about them from their peers and professors. This could help the agency over time to work with industry and students to connect them.

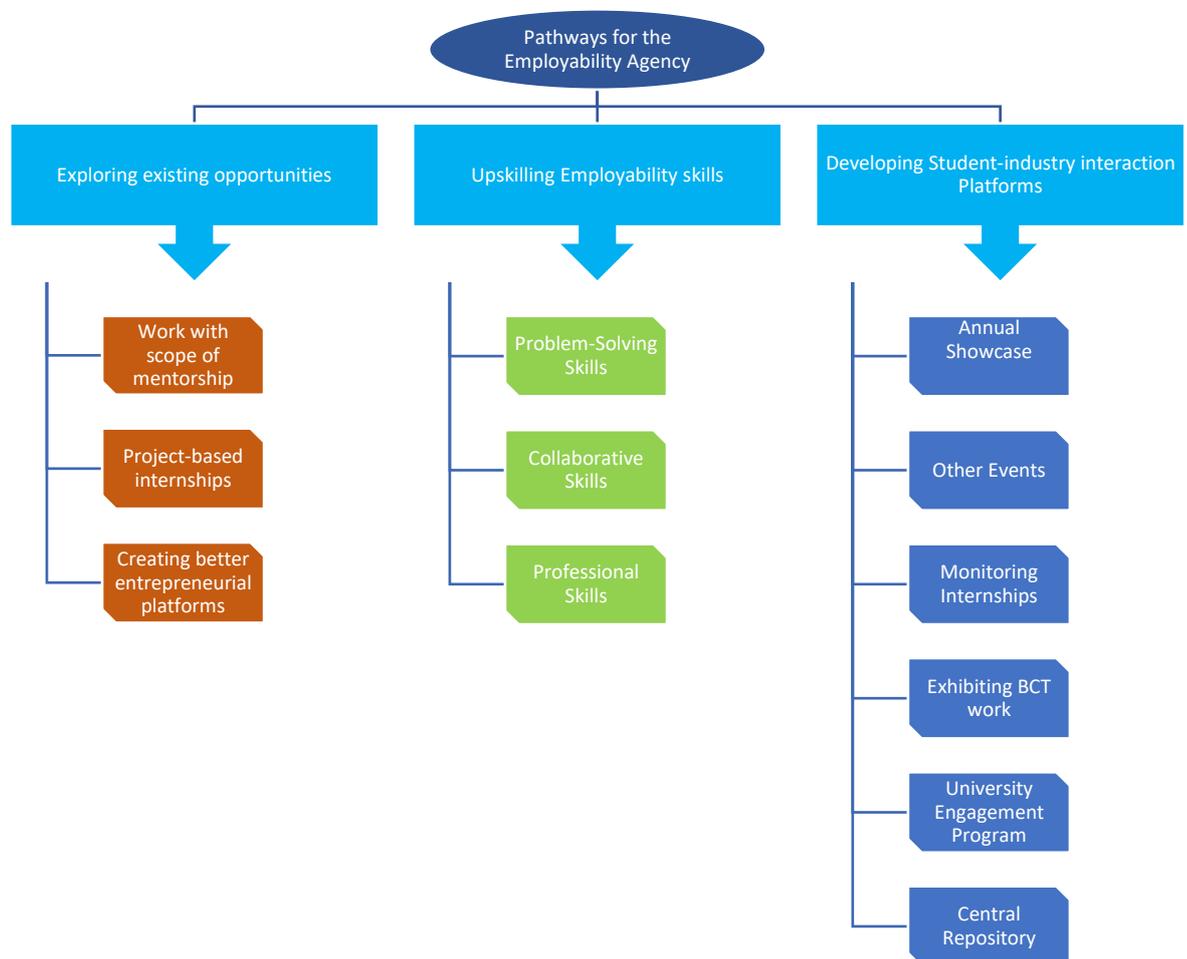


Figure 3.3. Pathways for the 'Employability Agency'.

Connections to Literature

The concept of Employability has had substantial interest over the last couple of decades and a number of studies have helped build this up (Hillage and Pollard 1998; Garavan 1999). It has also been called an attractive but confusing professional buzzword (Thijssen et al., 2008).

One of the most popular definitions and largely accepted definitions for Employability (Hillage and Pollard, 1998)

‘Employability is about the capability to move self-sufficiently within the labour market to realise potential through sustainable employment. For the individual, employability depends on the knowledge, skills and attitudes they possess, the way they use those assets and present them to employers and the context (eg. personal circumstances and labour market environment) within which they seek work.’

There are three primary perspectives on employability (Rothwell et al., 2009). The first is at a national workforce level (Almeida, 2007; Berntson et al., 2006; Brown et al., 2004; Lane et al., 2000) related to government policy or national-level skills agendas, or at an industry level (de Grip et al., 2004). The second is about employability in the field of human resource management related to the ability of individuals to get and retain jobs (Baruch, 2001; Forrier & Sels, 2003). The third is related to the universities being able to provide the graduates with skills that employers need (Mason et al., 2003).

A similar outlook is shared by Tomlinson (2017) in his paper where he summarises graduate Employability at 3 levels. The first being at a ‘Macro Level’ – where he highlights that employability is viewed in wider structural, system-level shifts in capitalism and how educational systems are coordinated within that framework. The Second is the ‘Meso level’ – at which level, employability and people’s work-related activities are mediated by institutional-level processes located within both educational and organisational domains. And the third is at a ‘Micro level’ – where the focus is more on how employability is constructed at a personal level and its relationship with a range of subjective, biographical and psycho-social dynamics, and which are also informed by individuals’ cultural profiles and backgrounds.

There is also substantial research on the skillsets that need to be enhanced by graduates to be more ‘employable’ (Bui et al., 2019). Graduates need both ‘soft’ skills, such as communication skills and team working skills, and ‘hard’ business knowledge, such as qualifications and the ability to apply theoretical and conceptual knowledge to real life business situations to be employable (Andrews & Higson 2008). In addition to these skills Bridgstock (2009) suggested that graduate employability could be enhanced by developing career development skills.

Looking at it from a university’s perspective, they have more control to effect immediate changes at their scale and level vis-à-vis at the larger macro level. Additionally, they could help motivate students to be more involved to work on their employability aspects. This is complemented by the general expectations of industry and students.

Universities have to manage multiple challenges such as an impractical curriculum, outdated curriculum, lack of investment in technology, poorly-qualified staff, a disconnect between current teaching and learning practices and the demands of the labour market, employers' expectations and students' needs, among others (Lašáková et al., 2017). What is also very important from the university's perspective is that the graduates' employability has become one of the biggest factors in university's ranking worldwide. Therefore universities across the world have a strong focus to cover the gap between the skillset of their graduates and the demand at the industry, to be able to attract the best talent in future in terms of students, researchers, industry expert collaborations, faculty, etc.

The agency sits methodically between all three parties at the centre of the Employability discussion. While at its scale and scope of work it is not in a position to affect changes required at a macro level i.e. at the industry level, but it certainly works in close association with it, keenly following changes in their approach or needs, and following up on the latest trends important to industry and the kind of graduates they are looking for to work with. In short, the Agency keep a tap on any changes to the persona of an employable graduate from the industry's perspective. This allows it to understand what the expectations on employability are from industry. This heightened sense of understanding helps it to inform representatives of the other two parties, the university (AUT in this case) and the students (the BCT students in this case), to help materialize their efforts to achieve better graduate employability.

To improve graduate employability the university enhances and refines its processes to help graduates improve their skillsets and explore to identify work opportunities where skillsets of the graduates could be employed. The Agency, as discussed above works closely with them to figure exactly how and where this gap needs to be filled and backs these by evidence collected from the research.

The gap between the industry's expectation of a graduate being employable and the skill level of a student graduating from the university, is currently also being bridged by other alternatives. These alternatives include organizations (typically small and local) which work to skill these recent graduates with skills the industry wants to make them more employable. Some large corporations have their own training centres where they train all recently hired graduates for a period of time which could vary from 6 months to a year, to make them work ready as per their needs. Other platforms, like the recent surge in online learning also bridge these gaps. The university needs to proactively look at reducing this gap on their own count, to stay more

relevant and to prevent a gradual migration of future students to these new avenues since they are perceived to create better employable graduates as per the industry requirements.

For the students it's an individualistic outlook, which would vary for each one of them. But in terms of being employable, the pool of skillsets required, over and above their transdisciplinary skills, can be identified. This the agency could do by building up on the research here and then taking constant feedback from industry over time. This understanding is shared and highlighted to students. The agency works discretely in collaboration with each one of them to help them identify their individual areas of improvement. The agency thus with a broad understanding of the expectations of industry in terms of employability, works with students to help them build themselves towards these expected levels of expertise.

Discussion

The perception that transdisciplinary Creative Technologies graduates were landing up with work opportunities that were not to their satisfaction or which did not utilise their skillsets completely, was the trigger to make inquiries in this area. Those inquiries paved the way for undertaking this research exercise. A deep dive into the literature in this field especially about transdisciplinarity, creative technologies, employability, gig economy and future of work gave the research a further sense of direction. This motivated a design-oriented project inquiry into understanding the issues around employability in this context. A Research-through-Design approach was undertaken to design an artefact, an 'Employability Agency', to explore the issues and ideas to improve the situation in the future. Methodologically a 'Research through Design' (RtD) approach was best suited with elements of qualitative research methods. RtD links the problem-solving purposes of design practice with the knowledge-creation purposes of design research (Markussen, 2017). This project is also guided by "Design Thinking" (DT) frameworks to structure its practice elements. Semi-structured interviews were conducted with stakeholders and the data collected helped identify inductively actionable insights to design an employability agency.

Our area of research evoked high interest from the different stakeholders who play a range of roles and have varied agendas and priorities. The researcher made every effort to empathise with the participants to appreciate their point of view and concerns better. The interviewees were asked about their views on the core skills for a BCT graduate, and the kind of companies that are a better fit for these skillsets. They were asked about how networking with professionals can be increased and how members of the industry could be better informed about their skillsets. The industry experts were additionally inquired about what profiles they

would hire these graduates for. The interview questions were designed to give a sense of direction to the discussions and allowed participants to express at length their views and perspectives.

The research made visible the sense of urgency and anxiety that students and recent graduates have in terms of finding the right work opportunities. Arguably the main result of this study was related to the lack of awareness about existing initiatives and opportunities that go unaddressed, or whose value is not sufficiently appreciated. The analysis also highlighted that start-ups are perceived by the students to offer roles with which they associate better due to the students' perception of these companies using creative technologies in a disruptive way and their own entrepreneurial outlook. While this provides them with the opportunity to be at the fore of path breaking changes in technology, a lack of mentoring and learning at such avenues might leave them misguided and directionless. For a student, this reflects a lack of awareness of opportunities and probable inadequate exposure to multiple relevant perspectives.

This study also brought attention to certain ongoing initiatives such as internships, entrepreneurship and the university's engagement policies with companies which could be relooked at to make them more apt and relevant. It emphasises the importance for the university to refine existing platforms to enhance their relevance over time. It also reveals how subjects such as developing professional skills, which are sometimes not given their due importance at universities, are considered really critical and unavoidable by industry experts.

Beyond the student showcase, in the past more interactive events were organised by the BCT including hackathons and meet-ups. Their dissipation could be explained by a lack of understanding of the value they carry for students and graduates. It is therefore highly pertinent for the creative technologies school and the university in general to be taking feedback from industry and other relevant avenues.

Conclusions

The research at its core was an exercise which highlights the need for organizations to explore, refine and evolve their processes and outlooks basis stakeholder needs and changing external factors. It becomes especially relevant given that most educational organizations were caught off-guard in the wake of the COVID-19 pandemic. While most of the teaching process was moved online, aspects of building skills such as collaboration and teamwork in students had to take a back seat.

Our research in trying to help BCT students get better work opportunities, identified existing opportunities not explored enough, highlights the need and the areas to upskill the

graduates and emphasises on the need for multiple stronger student-industry interaction platforms. In its quest to seek answers for transdisciplinary BCT graduates, the research also opens several questions about the graduate employability space, the evolving role of universities, the changing requirements of industry and the need for setting up an effective feedback system for organizations to gauge the changing needs of their stakeholders.

While the study looked at aspects of employability of students for one particular program at an individual university, the study has thrown up some very pertinent questions for future work. A study with a similar research question but to inquire for larger organizations, like the entire university, could be an interesting exercise. Results of such a study could go on to inform universities on their future plans with respect to employability. Such a study could also lead to work in researching whether universities should work more closely and collaboratively with involved stakeholders to design a feedback system that would help them evolve their systems and policies at a rate demanded by industry and other stakeholders. It would be interesting to see what results such inquiries would generate.

With our research work suggesting that industry professionals have a strong emphasis to employ people who are high on collaborative skills and have a problem-solving focus, future research could inquire on what emphasis universities are putting into developing such skills in students and how that could be improved. This is especially all the more significant as learning organizations have had to move their processes online in view of the global COVID-19 pandemic. Online learning could have one major drawback with students not meeting in shared physical spaces which could hinder collaborative skills and teamwork. Inquiry into overcoming such issues would add value to the learning environments of the universities.

The COVID-19 pandemic has also led to a disruption in the medium of physical information exchange due to an increased usage of the online and remote learning modes. With norms of physical distancing and social distancing being incorporated across the globe, the modus operandi of sharing knowledge in groups would always have needed a relook. Especially given the fact that the modes and remote learning platforms available beyond the university had already made an impact by providing industry recognised knowledge and certifications over the last decade. A disruption like the pandemic further aids their cause. It appears therefore, that the universities need to relook at their value propositions and modulate their processes to be concurrent with the changing demands.

While the study focused on jobs in the industry for the BCT students the study brought forth the idea that a quite a few BCT graduates look at entrepreneurship as their next work

opportunity. The Creative Technologies graduates themselves affirming that the pedagogy at the university aspires them to look at themselves as entrepreneurs. The university could, therefore, invest more resources to help these students learn and develop other related skills that would make them conceptually stronger as aspiring entrepreneurs. Insights from our research suggests the university needs to work closely with stakeholders to make the most of existing untapped opportunities and restructure processes to align with changing demands in industry. Future research to inquiry into the specifics of how the universities can adapt could dictate changes to their knowledge imparting processes.

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Appendices

Appendix A: Ethics Approval

Appendix B: Tools

- a) Interview protocol – Industry representatives
- b) Interview protocol – Students and recent graduates
- c) Participation Information Sheets – Industry Representatives
- d) Participation Information Sheets – Students and recent graduates
- e) Sample Consent form
- f) Post on a social Media Platform used to reach out to Alumni participants.
- g) Poster used to reach out to student participants.

Appendix A: Ethics approval



Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

14 November 2019

Ricardo Sosa
Faculty of Design and Creative Technologies

Dear Ricardo

Re Ethics Application: **19/400 Designing a student led agency to create better employability related opportunities for Bachelor of Creative Technologies students at AUT**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 14 November 2022.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.

AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted. When the research is undertaken outside New Zealand, you need to meet all ethical, legal, and locality obligations or requirements for those jurisdictions.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through <http://www.aut.ac.nz/research/researchethics>

Yours sincerely,



Kate O'Connor
Executive Manager
Auckland University of Technology Ethics Committee

Cc: ctm4024@autunl.ac.nz; Amabel Hunting

Appendix B: Tools

a) Interview Protocol – Industry Representatives

After greeting the participant, I will hand over the consent form for the participant to sign. Once that is done, I will inform the participant about how the interview will be conducted. I will tell them that the whole interview will be recorded, but if there is any information, they want to be excluded to let me know.

Post that I will start with the questions for the interview. The semi-structured questions will be based on the following.

- 1) What are the core skills people look in a “Bachelor of Creative Technologies” (BCT) graduate?
- 2) What kind of companies are a better fit for the skill sets (focusing on the transdisciplinary skills) of a BCT graduate? (start-ups or larger well-established companies)
- 3) What are the entry level roles BCT grads join into generally? Are these to the satisfaction of the graduates? What are your views on this?
- 4) What do you think the creative technologies industry is doing that is beneficial for the BCT graduates joining into the industry?
- 5) What are the advantages and disadvantages of internships or any other work opportunities during the study period?
- 6) What do you think could be ways to get more internships / work opportunities – Specific to the Creative Technologies domain?
- 7) What could be the advantages and disadvantages of Work-integrated-Learning for a BCT graduate?
- 8) How could members of the industry be better educated about the transdisciplinary skillsets of the BCT graduates?
- 9) How could networking with industry people working in the creative technologies domain be increased?
- 10) Would an event (like the current annual Showcase at AUT or other events that happen across Auckland, elsewhere) be a better exposure for the students to showcase their expertise and network with industry representatives?
- 11) How would you plan/shape organize such an event?
- 12) What could be other ways to increase industry exposure for the BCT graduates?
- 13) What profiles would you hire a BCT grad for?

I will also ask any related questions that might arise out of the discussion.

Once that is done, I will inform the participant that the findings of the research will be shared with the participant.

Then I will thank the participant and see the participant out.

b) Interview Protocol – Students and Recent Graduates

After greeting the participant, I will hand over the consent form for the participant to sign. Once that is done, I will inform the participant about how the interview will be conducted. I will tell them that the whole interview will be recorded, but if there is any information, they want to be excluded to let me know.

Post that I will start with the questions for the interview. The semi-structured questions will be based on the following.

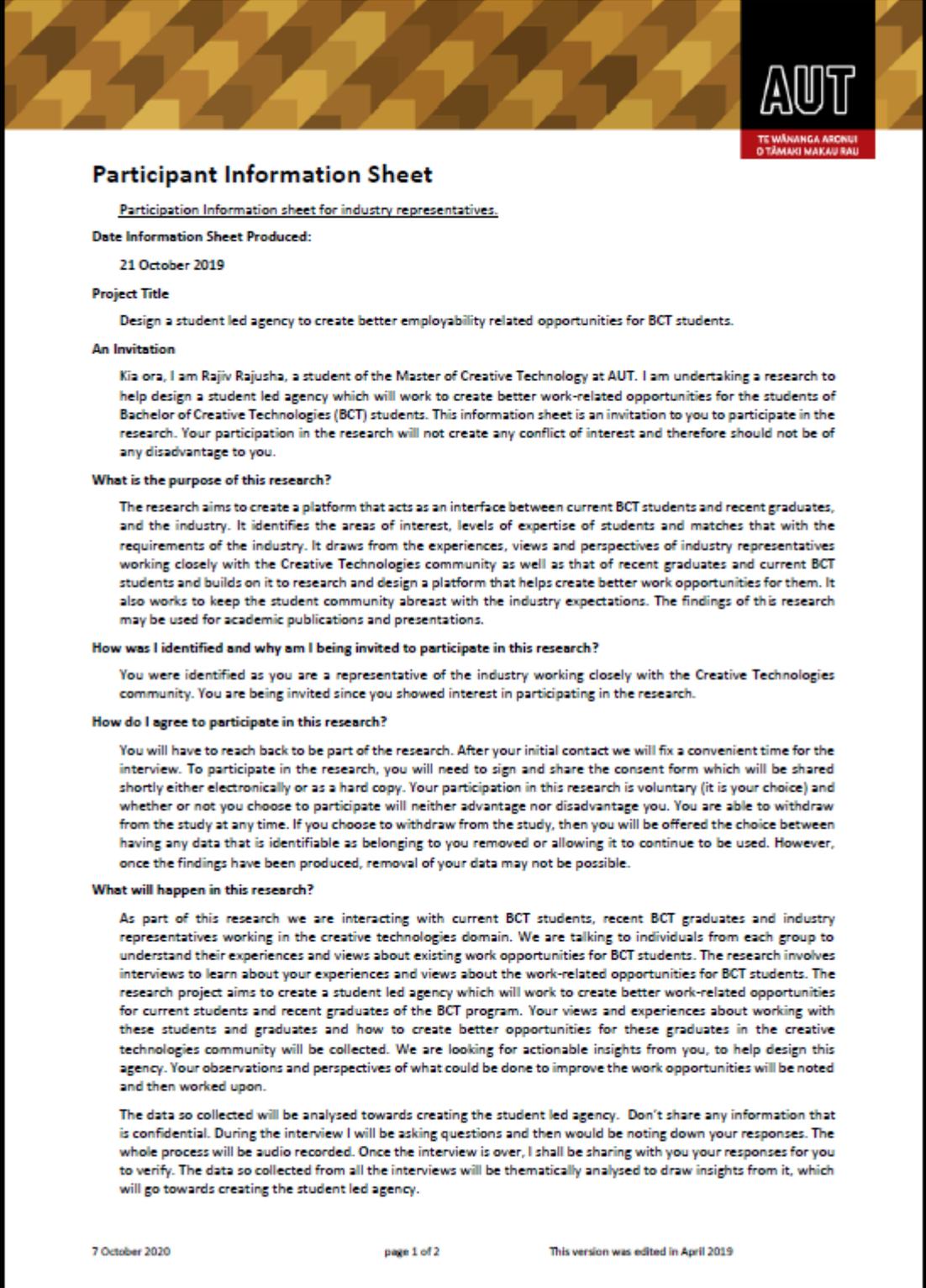
- 1) What are the core skills people look in a BCT graduate?
- 2) What kind of companies are a better fit for the skill sets of a BCT graduate?
- 3) What are the entry level roles BCT grads join into generally? Are these to the satisfaction of the graduates? What are your views on this?
- 4) What do you think industry is doing that is good for BCT graduates?
- 5) What are the advantages and disadvantages of internships or any other work opportunities during the study period?
- 6) What do you think could be ways to get more internships / work opportunities?
- 7) What could be the advantages and disadvantages of Work-integrated-Learning for a BCT graduate?
- 8) How could members of the industry be better educated about the skillsets of the BCT graduates?
- 9) How could networking with people working in the creative technologies domain be increased?
- 10) Would an event be a better platform for such exposure to the industry?
- 11) How would you plan/shape organize such an event?
- 12) What could be other ways to increase industry exposure for the BCT graduates?

I will also ask any related questions that might arise out of the discussion.

Once that is done, I will inform the participant that the findings of the research will be shared with the participant.

Then I will thank the participant and see the participant out.

c) Participation information sheets – Industry Representatives



AUT
TE WĀNANGA ARONUI
O TĀMAKI MAKĀU RAU

Participant Information Sheet

Participation Information sheet for industry representatives.

Date Information Sheet Produced:
21 October 2019

Project Title
Design a student led agency to create better employability related opportunities for BCT students.

An Invitation
Kia ora, I am Rajiv Rajusha, a student of the Master of Creative Technology at AUT. I am undertaking a research to help design a student led agency which will work to create better work-related opportunities for the students of Bachelor of Creative Technologies (BCT) students. This information sheet is an invitation to you to participate in the research. Your participation in the research will not create any conflict of interest and therefore should not be of any disadvantage to you.

What is the purpose of this research?
The research aims to create a platform that acts as an interface between current BCT students and recent graduates, and the industry. It identifies the areas of interest, levels of expertise of students and matches that with the requirements of the industry. It draws from the experiences, views and perspectives of industry representatives working closely with the Creative Technologies community as well as that of recent graduates and current BCT students and builds on it to research and design a platform that helps create better work opportunities for them. It also works to keep the student community abreast with the industry expectations. The findings of this research may be used for academic publications and presentations.

How was I identified and why am I being invited to participate in this research?
You were identified as you are a representative of the industry working closely with the Creative Technologies community. You are being invited since you showed interest in participating in the research.

How do I agree to participate in this research?
You will have to reach back to be part of the research. After your initial contact we will fix a convenient time for the interview. To participate in the research, you will need to sign and share the consent form which will be shared shortly either electronically or as a hard copy. Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?
As part of this research we are interacting with current BCT students, recent BCT graduates and industry representatives working in the creative technologies domain. We are talking to individuals from each group to understand their experiences and views about existing work opportunities for BCT students. The research involves interviews to learn about your experiences and views about the work-related opportunities for BCT students. The research project aims to create a student led agency which will work to create better work-related opportunities for current students and recent graduates of the BCT program. Your views and experiences about working with these students and graduates and how to create better opportunities for these graduates in the creative technologies community will be collected. We are looking for actionable insights from you, to help design this agency. Your observations and perspectives of what could be done to improve the work opportunities will be noted and then worked upon.

The data so collected will be analysed towards creating the student led agency. Don't share any information that is confidential. During the interview I will be asking questions and then would be noting down your responses. The whole process will be audio recorded. Once the interview is over, I shall be sharing with you your responses for you to verify. The data so collected from all the interviews will be thematically analysed to draw insights from it, which will go towards creating the student led agency.

7 October 2020 page 1 of 2 This version was edited in April 2019

What are the discomforts and risks?

There should be no discomforts or risks to you, as only your views and experiences will be asked for. Also confidentiality of each participant will be maintained. Complete participant anonymity will be maintained in the research. No such information that could help identify any person will be used.

How will these discomforts and risks be alleviated?

Since the research will involve interviewing you to understand your views, perspectives and experiences regarding the work-related opportunities for BCT graduates in the Creative Technologies community, there should be no discomforts or risks involved. Participants are specifically asked not to name anyone, and if they do name anyone, the same will be highlighted to them at the end of the interview, and they will be informed that no identities will be highlighted as part of the research.

What are the benefits?

The participants in the research, i.e. the current 3rd year BCT students, recent BCT graduates and the industry representatives working closely with the Creative Technologies community, stand to potentially benefit from the findings of the research. The students in the creative technologies community will have a greater understanding of the existing and upcoming opportunities in the industry. They will also stand to learn the expectations and requirements of the industry. This will potentially help them identify better work-related opportunities for themselves. The industry representatives who are the other set of participants get to learn more about the students and their expertise and skill sets. They will feel heard about their needs and views by academia, since the research is quite largely concerned about taking in their views and perspectives during the interviews. This will also draw them in a space of reflection about the way they hire from the Creative Technologies community. The primary researcher looks at this research work as an opportunity to develop his entrepreneurial skills. He feels there is an existing gap between the multi-disciplinary skillsets of the BCT students and the prevalent opportunities for them in the industry. The research is an attempt to fill this space so that the students can identify better work opportunities and the industry awareness about them increases. Also, this being a part of the thesis the research helps the primary researcher graduate the Master of Creative Technologies. For the primary researcher this is also an exposure to get a practical experience of how research is undertaken. The wider community benefits by a broadening of knowledge about the effectiveness and expertise of the Creative technologies' graduates as resources. This could also be a precursor to more work that might happen in this domain.

How will my privacy be protected?

The participants' information will be treated as confidential. Any identifying information will be changed so no one can identify the participants. Only my supervisors and me will have access to the data. The participants may request their interview transcript to review.

What are the costs of participating in this research?

To conduct the interview, I will need about 30 to 45 minutes of your time.

What opportunity do I have to consider this invitation?

You will have two weeks to consider and respond to this invitation.

Will I receive feedback on the results of this research?

A short summary of the findings of the research will be shared with you after the research is over. In case you don't want the same please indicate the same in the consent form.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisors, Ricardo Sosa, Ricardo.sosa@aut.ac.nz or Amabel Hunting Amabel.hunting@aut.ac.nz. Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, ethics@aut.ac.nz, 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details: Rajiv Rajusha, ctm4024@autuni.ac.nz

Project Supervisor Contact Details: Ricardo Sosa, Ricardo.sosa@aut.ac.nz; Amabel Hunting Amabel.hunting@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on 14th November 2019, AUTEK Reference number 19/400.

d) Participant Information sheet – students and recent graduates



Participant Information Sheet

Participation Information sheet for students and recent graduates of BCT.

Date Information Sheet Produced:

21 October 2019

Project Title

Design a student led agency to create better employability related opportunities for BCT students.

An Invitation

Kia ora, I am Rajiv Rajusha, a student of the Master of Creative Technology at AUT. I am undertaking a research to help design a student led agency which will work to create better work-related opportunities for the students of Bachelor of Creative Technologies (BCT) students. This information sheet is an invitation to you to participate in the research. Your participation in the research will not create any conflict of interest and therefore should not be of any disadvantage to you. Findings of the research should on the contrary help identify better work-related opportunities for you.

What is the purpose of this research?

The research aims to create a platform that acts as an interface between current BCT students and recent graduates, and the industry. It identifies the areas of interest, levels of expertise of students and matches that with the requirements of the industry. It draws from the experiences of recent graduates and current BCT students and builds on it to research and design a platform that helps create better work opportunities for them. It also works to keep the student community abreast with the industry expectations. The findings of this research may be used for academic publications and presentations.

How was I identified and why am I being invited to participate in this research?

You were identified as you are a current student of a recent graduate of the BCT program at AUT. You are being invited since you showed interest in participating in the research. You will need to be a current 3rd year student of BCT planning to work in Auckland, or a recent graduate of the same program, working in Auckland.

How do I agree to participate in this research?

You will have to reach out to me to be part of the research. After your initial contact we will fix a convenient time for the interview. To participate in the research, you will need to sign and share the consent form which will be shared shortly either electronically or as a hard copy. Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?

As part of this research we are interacting with current BCT students, recent BCT graduates and industry representatives working in the creative technologies domain. We are talking to individuals from each group to understand their experiences and views about existing work opportunities for BCT students. The research involves interviews to learn about your experiences and views about the work-related opportunities for BCT students. The research project aims to create a student led agency which will work to create better work-related opportunities for current students and recent graduates of the BCT program. Your views and experiences about working with these students and graduates and how to create better opportunities for these graduates in the creative technologies community will be collected. We are looking for actionable insights from you, to help design this agency. Your observations and perspectives of what could be done to improve the work opportunities will be noted and then worked upon.

The data so collected will be analysed towards creating the student led agency. Don't share any information that is confidential. During the interview I will be asking questions and then would be noting down your responses. The whole process will be audio recorded. Once the interview is over, I shall be sharing with you your responses for you to verify. The data so collected from all the interviews will be thematically analysed to draw insights from it, which will go towards creating the student led agency.

What are the discomforts and risks?

There should be no discomforts or risks to you, as only your views and experiences will be asked for. Also confidentiality of each participant will be maintained.

How will these discomforts and risks be alleviated?

Since the research will involve interviewing you to understand your views, perspectives and experiences regarding the work-related opportunities for BCT graduates in the Creative Technologies community, there should be no discomforts or risks involved.

What are the benefits?

The participants in the research, i.e. the current 3rd year BCT students, recent BCT graduates and the industry representatives working closely with the Creative Technologies community, stand to potentially benefit from the findings of the research. The students in the creative technologies community will have a greater understanding of the existing and upcoming opportunities in the industry. They will also stand to learn the expectations and requirements of the industry. This will potentially help them identify better work-related opportunities for themselves. The industry representatives who are the other set of participants get to learn more about the students and their expertise and skill sets. They will feel heard about their needs and views by academia, since the research is quite largely concerned about taking in their views and perspectives during the interviews. This will also draw them in a space of reflection about the way they hire from the Creative Technologies community.

The primary researcher looks at this research work as an opportunity to develop his entrepreneurial skills. He feels there is an existing gap between the multi-disciplinary skillsets of the BCT students and the prevalent opportunities for them in the industry. The research is an attempt to fill this space so that the students can identify better work opportunities and the industry awareness about them increases. Also, this being a part of the thesis the research helps the primary researcher graduate the Master of Creative Technologies. For the primary researcher this is also an exposure to get a practical experience of how research is undertaken.

The wider community benefits by a broadening of knowledge about the effectiveness and expertise of the Creative technologies' graduates as resources. This could also be a precursor to more work that might happen in this domain.

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What are the costs of participating in this research?

To conduct the interview, I will need about 30 to 45 minutes of your time.

What opportunity do I have to consider this invitation?

You will have two weeks to consider and respond to this invitation.

Will I receive feedback on the results of this research?

A short summary of the findings of the research will be shared with you after the research is over. In case you don't want the same please indicate the same in the consent form.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisors, Ricardo Sosa, Ricardo.sosa@aut.ac.nz or Amabel Hunting Amabel.hunting@aut.ac.nz

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, ethics@aut.ac.nz, 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Rajiv Rajusha, ctm4024@autuni.ac.nz

Project Supervisor Contact Details:

Ricardo Sosa, Ricardo.sosa@aut.ac.nz; Amabel Hunting Amabel.hunting@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on 14th November 2019, AUTEK Reference number 19/400.

f) Post on a social Media Platform used to reach out to Alumni participants.

Facebook post:

Kia ora,

I am Rajiv Rajusha, a student of the Master of Creative Technology at AUT. I am undertaking a research to help design a student led agency which will work to create better work-related opportunities for the students of Bachelor of Creative Technologies (BCT) students.

The research aims to create a platform that acts as an interface between current BCT students and recent graduates, and the industry. It identifies the areas of interest, levels of expertise of students and matches that with the requirements of the industry. It draws from the experiences of recent graduates and current BCT students and builds on it to create better work opportunities for them. It also works to keep the student community abreast with the industry expectations.

The project will involve interviews to learn about your experiences and views about the work-related opportunities for BCT students. Participants will be interviewed to get their views and perspectives and these insights will be used to help create a student agency. During the interview I will be asking questions and noting down your responses. The whole process will be audio recorded. Once the interview is over, I shall be sharing with you your responses for you to verify.

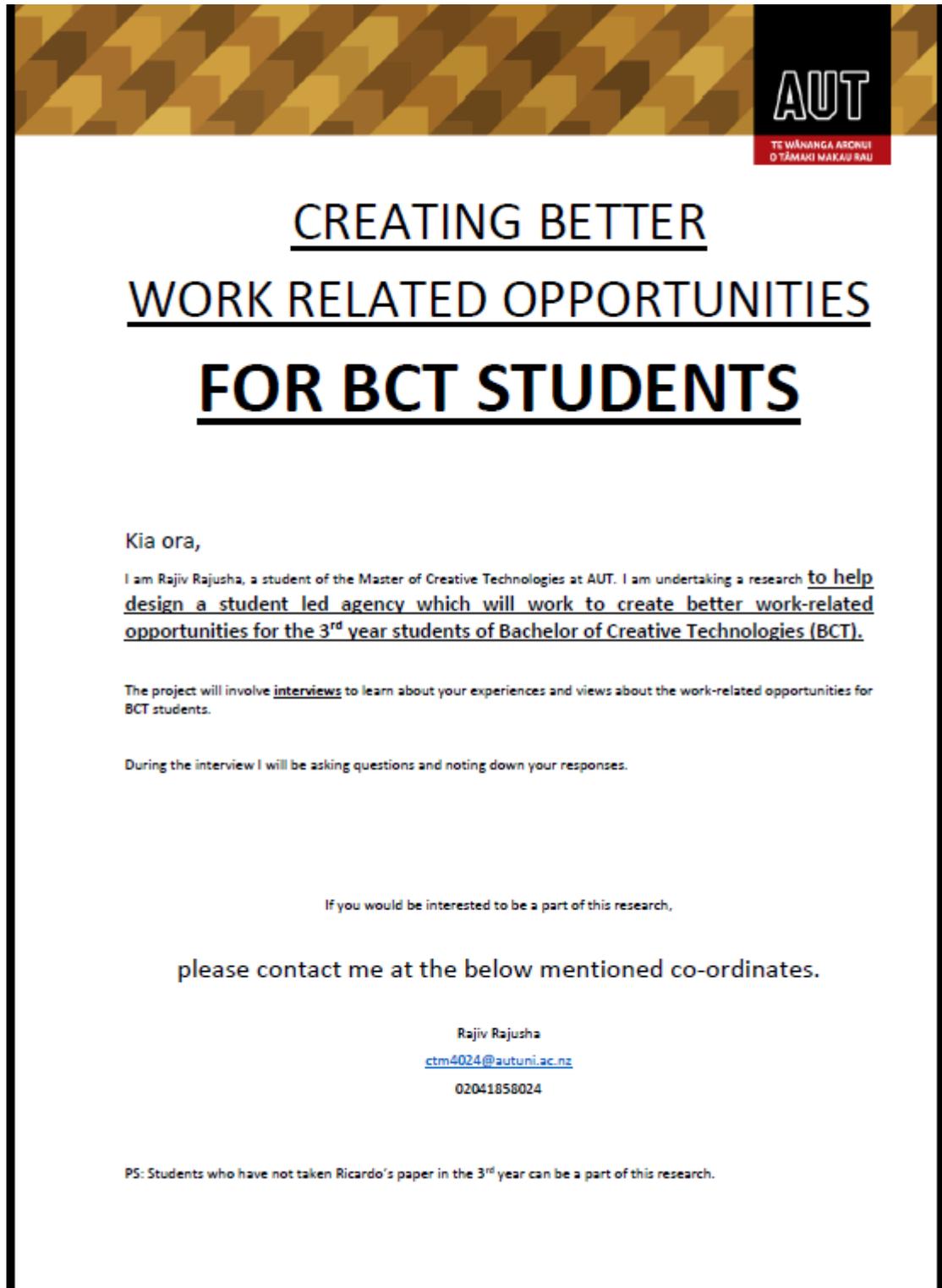
If you would be interested to be a part of this research, please contact me below.

Rajiv Rajusha

Ctm4024@autuni.ac.nz

02041858024

g) Poster used to reach out to student participants.



AUT
TE WĀNANGA AROHUI
O TĀMAKI MAKAU RAU

CREATING BETTER WORK RELATED OPPORTUNITIES FOR BCT STUDENTS

Kia ora,

I am Rajiv Rajusha, a student of the Master of Creative Technologies at AUT. I am undertaking a research to help design a student led agency which will work to create better work-related opportunities for the 3rd year students of Bachelor of Creative Technologies (BCT).

The project will involve interviews to learn about your experiences and views about the work-related opportunities for BCT students.

During the interview I will be asking questions and noting down your responses.

If you would be interested to be a part of this research,

please contact me at the below mentioned co-ordinates.

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PS: Students who have not taken Ricardo's paper in the 3rd year can be a part of this research.