Industry Insights: Assessing Canadian Undergraduate Industrial Design Practica Through a Company Lens

by

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ABSTRACT

This research is a qualitative assessment of current undergraduate industrial design practica that are implemented in four-year-based accredited Canadian schools through industry expert insights.

Bachelor of industrial design programs in this study offer hands-on industry experience to students between 3rd and 4th years who have completed preliminary program requirements to be considered as eligible candidates. While students take on the real-world experience through industrial design practica, some challenges are anticipated as students navigate multiple tasks in a company environment. To validate the effectiveness of current industrial design practica, the research is organized in the following methods.

1. A case study of six Canadian industrial design practica through program handbooks and school websites.
2. Semi-structured interviews of eight practicum advisors and thirteen company experts by using the Delphi Method.

Research findings from academic and company insights propose ways to enhance the current industrial design practica by examining the roles of a key supervisor at a work placement, availability of student resources, degree of interactions within assigned departments, the need for funding sources, and understanding industry expectations. The research data also extracts other collaborative learning opportunities for undergraduate students through industry partnerships.

Keywords: Undergraduate design practica, expert insights, transferable skills, industry expectations, work preparedness.
PREFACE

Two summers ago, I had the opportunity to participate in the Academic Design Management Conference hosted by the Design Management Institute. Dr. Garvey felt it was a perfect way for me to explore a thesis topic.

After reading the conference themes, I thought about how I could contribute to the industrial design field. Within the conference tracks, I was drawn to the theme of Design Education for the Public Good. The dots began connecting as I explored the history of industrial design and the evolution of design practices after the industrialization period. There were important discussions on the training of future designers and educating the public through knowledge.

For many design activities in Europe after the Post-Industrial Revolution but particularly in the early twentieth century, there were links to the International Council of Societies of Industrial Design, the predecessor of today’s World Design Organization (WDO). Industrial design practica came into my view as I began to research how design is currently practiced by experts. I am grateful for all the support received by Dr. Garvey and his professional network in WDO for providing meaningful insights for this research.
ACKNOWLEDGEMENTS

Thank you, Lord, for granting me health and perseverance to complete my studies, for all the people in my life who offered me their valuable time to walk the journey together. My warmest thanks to my big sister Theresa and my parents for their love and support.

My special gratitude to Dr. Thomas Garvey, my thesis supervisor and life mentor who always believed in me. Thank you for your inspirations during our walks in the woods and occasional meetups at Kettlemen’s during my studies. Many thanks to Dr. Mugendi K. M’Rithaa, my thesis co-supervisor who provided tremendous support and guidance despite his busy schedule. Thank you, Professor Tim Haats, for introducing me to the company experts at Design 1st. Also, I’d like to thank Dr. Chris Smelser for his valuable time and insights for improving my research. Thank you, Dr. Won Joon Chung, for assisting me throughout the Master of Design program. Your positive spirit inspired me to persevere towards thesis completion. Thank you, Professor Stephen Field, for introducing me to the M. Des. program at the 2016 Rocket Show.

I’d like to thank the World Design Organization (WDO) for providing me with excellent learning opportunities to participate in research workshops and industry events that enhanced my skills. Thank you, especially David Kusuma and Anne Asensio at WDO, for sharing your experience and helping with my research interviews.

To all research participants, thank you for your valuable time to participate in the interview sessions, despite the inconvenience of scheduling virtual meetings from different time zones. Your insights will not only add value to industrial design related practicum programs, but it will also contribute to discovering talents among undergraduate students who will make significant contributions to their field.

My sincere gratitude to all faculty members of the School of Industrial Design and the Faculty of Graduate and Postdoctoral Affairs at Carleton University, who assisted, encouraged, and trusted me with enriching learning opportunities.
Thank you to all my M. Des. colleagues and Ottawa friends for being part of my journey, particularly Jed Looker, Ahmed Asfand, and Angela Fahlman for offering insights into this research. Many thanks to Cynthia Morawski and Amira Ashraf for our friendship and support in times of personal struggle.

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GLOSSARY

Apprenticeship
The term apprenticeship has evolved over the years to distinguish different methods of skill training, working under a master of trades or crafts on contracted terms. It originated from traditional methods of developing skills in trades or craft making for increasing competency-based skills (Oxford University Press, 2015).

Capstone Project (CP)
Projects for final years that prepare undergraduate students for full-time employment (Deters, Paretti, & Ott, 2020). To “realize the importance of vigorous and continued effort to search for employment” (Chickerur, 2015, p.45).

Co-operative Education
In 19th century Britain, co-operative education received very little attention (Webster et al., 2012). Historians have noted that the purpose of the co-operative education movement was to transfer the learning and working quality from individual learners to groups in the working class (Webster et al., 2012). It was commonly regarded as an academic requirement for adult learners for educational growth (Webster et al., 2012). Today, co-operative education offers many benefits to different groups such as students and schools, while maintaining profitable relationships with industry partners (Garaven & Murphy, 2001).

Experiential Learning
Experiential learning provides access to real-world experience outside of classroom environments. This term is more common within the academic community rather than in external companies (Parker, 2006). Experiential learning branches out to different types of learning experience such as co-operative education, practica, study abroad, internships, apprenticeships, or service learning (Budhai & Skipwith, 2017).

Practicum
A specialized course in a degree program to prepare undergraduate students for desired career paths or work experiences (Parker, 2006). The practica are a type of experiential learning of a short time engagement within a specific study area (Budhai & Skipwith, 2017).
unpaid, learning outcomes of the practica are usually field reports or journals that practicum advisors evaluate for term credit (Budhai & Skipwith, 2017).

*Study Abroad*

Another form of experiential learning where students go to foreign countries to discover new learning opportunities and develop skills in specific educational programs (Budhai & Skipwith, 2017).

*Work Integrated Learning (WIL)*

A more structured form of learning that involves training on the jobsite for developing skills while earning an academic credit. Internships are also considered as work integrated learning. Projects tend to be more conceptual within classroom setting where knowledge is gained through printed media or lectures. Therefore, students may have less exposure to challenging situations, as opposed to real work environments where students enhance skills such as communication, teamwork, and problem-solving (Bilsland, Carter, & Wood, 2017).
**ACRONYMS**

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<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ACID</td>
<td>Association of Canadian Industrial Designers</td>
</tr>
<tr>
<td>ACIDO</td>
<td>Association of Chartered Industrial Designers of Ontario</td>
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<tr>
<td>CCA</td>
<td>The Crestmont Community Association</td>
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<td>CEAD</td>
<td>Centre for Emerging Artists and Designers</td>
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<td>CUSA</td>
<td>Carleton University Students’ Association</td>
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<tr>
<td>DC</td>
<td>Design Council</td>
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<tr>
<td>DMI</td>
<td>Design Management Institute</td>
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<td>ICSID</td>
<td>International Council of Societies of Industrial Design</td>
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<tr>
<td>ID</td>
<td>Industrial Design</td>
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<td>IDSA</td>
<td>Industrial Designers Society of America</td>
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<td>IASDR</td>
<td>International Association of Societies of Design Research</td>
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<td>OCADU</td>
<td>Ontario College of Art and Design University</td>
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<tr>
<td>WIL</td>
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1.1. Research Background and Scope

The root of practica originates from John Dewey’s theory of learning by experience in a holistic perspective (Budhai & Skipwith, 2017). This theory is widely recognized as experiential learning (Silberman, 2007; Budhai & Skipwith, 2017), and adopted by many academic institutions in their practicum programs today. There are two distinct identifications of practica which are commonly known as co-operative education (Parker, 2006) and an internship (Budhai & Skipwith, 2017). Co-operative education (Webster et al., 2012) is often recognized as a more structured placement where minimal supervision is required (Gault, Leach, & Duey, 2010). Although co-operative education presents some disadvantages such as extra costs by the school program, existing research suggests its significance to work placement transition from an academic environment (Sathyamoorthy, 2003). Conversely, the nature of an internship requires more supervision and can be regarded as an entryway to develop multiple skills (Gault, Leach, & Duey, 2010).

While there are diverse opportunities to participate in hands-on experience through traditional internship opportunities, co-operative education placements, work integrated learning, study abroad, or capstone projects in school programs, current practice shows that these opportunities are limited. Studies suggest that there is not only a lack of research for undergraduate students in design-related disciplines, but there seems to be a disconnection between the undergraduate design community and industry (Akkawi, 2017). Findings in the literature suggest that there are ongoing challenges in practicum delivery in areas such as work preparedness, available supports for student learning, understanding the challenges, and the significance of institution-industry relations in various disciplines. With this perspective in mind, the research insights aim to answer the following research question.

Research question: How can current industrial design practicum advisors effectively transfer specific industry knowledge and skills to prepare undergraduate students to be industry-ready?
1.2. Rationale

“Industrial Designers place the human in the centre of the process. They acquire a deep understanding of user needs through empathy and apply a pragmatic, user-centric problem-solving process to design products, systems, services, and experiences” (WDO, 2022).

According to the World Design Organization, the role of an industrial designer fulfills user-centered understanding throughout the project phases. Industrial design practica are one of the effective ways this deep understanding of users can be fulfilled through hands-on learning opportunities in industrial design programs. In this research, there were different industrial design practica such as work integrated learning and co-operative education. However, internship opportunities were the core practicum activities that were encouraged by the practicum advisors in Canada and were valued by many global company experts. The research aims to assess the effectiveness of industrial design practica to add value to practicum development. The research insights from the practicum advisors and the company experts will identify the current challenges that undergraduate students encounter during practicum experiences. Also, the research seeks greater collaboration between school programs and companies to provide more internship opportunities to undergraduate students.

1.3. Role of Practica

In this research, a practicum is regarded as a pathway for undergraduate students to engage in real-world opportunities. Students apply in-class learnings to real work in an industry that aligns with one’s career interest and direction. Schön characterizes a practicum in the science profession as “attitudinal and skill components” (1983, p.27) that usually take place later in the professional practice when a student has the capability to apply the learned knowledge to solve specific problem sets (Schön, 1983). University internships offer real-world opportunities to students whose level of industry experiences are limited to contributing to an innovative design solution or ideas for new products (Ranabahu, Almeida, & Kyriazis, 2020). Understanding the role of the practica in this research will allow undergraduate students to recognize the importance of hands-on learning opportunities for developing skill sets.
While there are many increased interests and attempts to justify innovative approaches to higher education in the field of art and design, these notions remain underdeveloped in some practice areas (Logan, 2007). Logan states that within the graphic design domain, as in many other arts and design disciplines, there is a lack of “empirical research insights” (Logan, 2007, p.4). The author addresses the challenge of articulating design knowledge effectively in a classroom environment which presents limited opportunities for students to engage (Logan, 2007). One of the ways empirical research insights can be best practiced is through the reflective process in problem solving, the notion of reflection-in-action highlighted in The Reflective Practitioner (Schön, 1983). In this book, Schön sets a perfect example of practicum pedagogy, where an effective learning outcome has been specified in architectural and clinical practice settings where the focus is geared towards task-based learning for students (Logan, 2007). While experiential learning takes place outside the classroom setting (Ranabahu, Almeida, & Kyriazis, 2020), students working on real-world problems in a clinical or engineering practicum apply the reflective process using existing knowledge based on existing problems (Schön, 1983).

1.4. Types of Practica
The existing research discusses the importance of hands-on learning experiences, also known as experiential learning. Types of experiential learning that presented real-world opportunities are internships, co-operative education, and study abroad that are offered to senior undergraduate students as an entryway into gaining professional experience, as well as to broaden knowledge in a specific industry (Budhai & Skipwith, 2017). Until students are ready to apply for work placement opportunities such as an internship, school programs integrate other hands-on learning opportunities through innovative and collaborative projects as part of practicum delivery (Chickerur, 2015).
CHAPTER 2. LITERATURE REVIEW

2.1. Introduction
Regardless of differences in expertise and intent of school programs in this research, hands-on learning opportunities through practica add value to student learning and further industry practice at a professional level. This hands-on practice, as noted by Carleton University’s School of Industrial Design, receives different designations such as a Co-operative Program or an Internship that serves different purposes for each student. Internship experience is often designed for undergraduate students who are in their final years (Chickerur, 2015). It is a type of experiential learning where undergraduate students transfer knowledge into field practice (Ktoridou & Doukanari, 2017). In this research, school programs address this hands-on learning component as Work-Integrated Learning (Bilsland, Carter, & Wood, 2017), Practicum Programs, or Design Practicums across North American colleges and universities (Sathymoorthy, 2003). With these opportunities, some of the industrial design programs in Canada have set different priorities and expectations to include mandatory or optional hands-on practice for their undergraduate students. During practica, students are exposed to working with real projects and real clients involving research and training activities through industry experts outside the classroom environment (Ranabahu, Almeida, & Kyriazis, 2020).

To assess the industrial design practica for undergraduate students in Canadian school programs, relevant studies revisited practica in diverse work placement settings that investigated their effectiveness, both in design-related or non-design-related disciplines. Based on the expert insights from the existing research, one can identify current measures and the challenges for undergraduate students when it comes to the transfer of current industry knowledge and skills to real-world opportunities. The following are examples of practica from the existing research such as engineering and business fields that suggest potential themes for a discussion in this research.

2.2. Relevant Theories to a Practicum Experience
For this research, some theories in the history of design were associated with a practicum experience, such as the process of reflective thinking required during certain tasks (Friedman, 2000). Victor Margolin wrote about the use of neoteric thinking by Richard Buchanan in his
keynote from a doctoral design education conference at Ohio State University (2010, p.70). This theory according to Margolin (2010), is described as new ideas being formed based on former knowledge, just as designers today transform the experience into a new knowledge by reflective thinking (Friedman, 2000). Kolb’s experiential learning model is an example of successful learning strategy that many school practicum programs incorporate today (Friedman, 2000). Also, Schön mentioned the importance of reflective thinking in design practice that can contribute to a practicum experience (Schön, 1983). A good example can be found in architectural practice, where reflective thinking plays a role as a conversational piece to generate new solutions to existing problems (Schön, 1983).

2.3. The Challenges in the Design Education
The existing research also discussed requirements for successful learning outcomes by examining internship programs in different areas such as engineering, business, marketing, and design-related disciplines. The research investigated the value of internships to enhance necessary skills to prepare for jobs in the industry (Ranabahu, Almeida, & Kyriazis, 2020; Ktoridou & Doukanari, 2017; Pillutla & Mandaleeka, 2015). The results of these studies identified employable skills of undergraduate students and measured work placement expectations, yet little attention is paid to researching undergraduate programs in the industrial design discipline.

The evolution of design practice stems from the Industrial Revolution that began in the early twentieth century, with many educational training programs and diverse design activities flourishing since the 1930s (Margolin, 2010). The history of design proves the importance of design practice by placing an emphasis on adequate training in the workforce (Margolin, 2010). The importance of design practice and development is also conveyed through professional and influential design associations (Gillies, 2015) such as the ICSID or IASDR for the purpose of educating professionals and in discussion of design research (Margolin, 2010).

2.4. Industry Expectations on Student Success
Today, college and university rankings measure success often identified by graduation employment rates of school programs. Many of these rankings are based on employment
prospects upon graduation, determined by the school’s reputation in history, alumni recognition, or satisfactory factors in campus facilities, services, or supports available for students. Based on the international assessment, one study has found success factors of student achievements in mathematics and science studies (Gillies, 2015). The visible factors to successful learnings included funding sources for program development, quality of training, connections to a community of networks, and the application of reflective learning processes on practices (Gillies, 2015). According to a three-month observational study by a program in Virginia, perspectives on work preparedness of engineering students showed varying results (Deters, Paretti, & Ott, 2020). Participants in this study felt they were more prepared as they “spent more time on the job” (Deters, Paretti, & Ott, 2020, p.4) towards the end of the third month. The challenge with student perception on work preparedness is that they are not experts in the industry to have valid critical evaluations of success at work placements (Deters, Paretti, & Ott, 2020). Hence, the existing research suggested the need for strong mentorship between students and industry supervisors to evaluate project needs and develop industry skills (Hudson et al., 1959; Ranabahu, Almeida, & Kyriazis, 2020).

2.5. Work Preparedness in Higher Education

Having a specialized focus would allow students to perform more specific tasks than “routine operational work” (Ktoridou & Doukanari, 2017, p.1721) and be prepared to gain new knowledge at a work placement (Margolin, 2010). When students showed interests in the company projects during a job interview, the company recruiters felt that students were qualified or prepared for more focused tasks and the interviews were meaningful (Hudson et al., 1959).

The perceptions of work preparedness varied between industry experts and undergraduate students based on existing research. The study that employed survey methods on work preparedness at various stages of work placement in an engineering program in Virginia Tech indicated that perceived preparedness was related to the time spent on tasks during work placement (Deters, Paretti, & Ott, 2020). Based on the report writing by students in this study, students generally felt that they were prepared towards the end of the practicum, however, the study result suggests that students may not have developed certain skills at an industry level to identify themselves as prepared for the work as a professional (Deters, Paretti, & Ott, 2020).
Another study addressed the perception of work preparedness in a business internship. Undergraduate students who had internship experience were “perceived to be better prepared” (Gault, Leach, & Duey, 2010, p.86) and had greater appeal for employers. To prepare the students to accept the real-world challenges during the work placement, assigned tasks need to be communicated more clearly and properly coached (Ktoridou & Doukanari, 2017). Until the students become more independent and build confidence with the given tasks at a placement, students first need to understand the areas of improvement through relevant coursework to the range of tasks (Metrôlho, Costa, & Silva, 2005). It is also important that students stay open to any given tasks as they need to learn to think innovatively in changing circumstances at the work environment (Metrôlho, Costa, & Silva, 2005).

2.6. Contributing Factors to a Successful Internship
An employability relates to characteristics of a person that are unique and suitable for the job being offered (Bhattacharyya, 2017). It establishes the successful outlook of the applicant while it benefits to the company, the economy, and the surrounding communities (Bhattacharyya, 2017). One study in the Philippines found that the most appealing employable traits in students had the following top three qualities; manner of speaking, self-confidence, and the ability to present ideas (Casuat & Festijo, 2020). One survey produced in the engineering field discussed that lack of exposure to the industry had effects on student success in learning outcomes (Kargar & Qasemi, 2007). According to this survey from the pulp and paper industry, the challenge faced by corporations related to the efficiency of the new hires, such as the lack of field knowledge (Kargar & Qasemi, 2007). In this example, the success of an internship was validated by the number of employments in a particular field which needs to be driven by a specific field knowledge.

Based on an engineering internship assessment titled, Engineering Internships with Project, the student performance vastly improved after a capstone project was integrated in the internship at a company (Chickerur, 2015). During this four-month internship period, students were paired up with a mentor from the faculty and a supervisor from the company (Chickerur, 2015). The advantage of a capstone project (Deters, Paretti, & Ott, 2020) during an internship was the
exposure to the range of complex projects to solve and situations that students can learn from (Kramer-Simpson, Newmark, & Dyke Ford, 2015).

2.7. Industry Relation
The value of industry partnerships was evident in some studies for student success. Based on one engineering survey in the UK, the company experts recommended universities to stay connected with opportunities to be “up to date and to shape the work skills of graduates” (Morgan & Direito, 2018, p.4). Through industry partnerships in schools, undergraduate students seemed to benefit from connected experience in their practical learning (James, 2017). The University of Calgary is an example where an internship opportunity was offered by the sports industry after discovering technical skills in engineering students (Chang, 2016, as mentioned in Ranabahu, Almeida, & Kyriazis, 2020). Another form of industry relation is evident through an alumni network (Ragusa, Matherly, & Phillips, 2014). Strong alumni networks are believed to have positive impacts in providing long-term development between business and the institution, one of the successful factors in a curriculum delivery (Plewa, Galan-Muros, & Davey, 2015). Studies have proven many collaborative efforts between school curricula and the industry to “bridge people and disciplines” (James, 2017, p.172) through innovative approaches to pedagogy.

2.8. Literature Review Summary
In the existing research, a practicum program that was supported by the government funding was addressed in some studies (Gillies, 2015; Morgan & Direito, 2018; Bilsland, Carter, & Wood, 2019), yet the government funding for undergraduate practica did not seem to be prioritized. Other concerns were addressed by researchers like Don Norman in design practice, where there was a lack of interaction between people but more with technology such as computers (Akkawi, 2017; Talbot, 2011). Steve Jobs had also noted the lack of diverse design experience in the industries, where people need to have wide breadths of knowledge and skills (Akkawi, 2017).

The industrial design discipline is a growing sector. Practicum as a gateway to real-world opportunities that can bring many possibilities to current undergraduate students by implementing industry expert insights in this research. The next chapters will assess and extract results from participant interviews to determine success factors in undergraduate students in their practicum experiences.
CHAPTER 3. METHODS

3.1. Introduction
The research was conducted in two methods through a case study and semi-structured interview. Among 21 participants who responded to the recruitment e-mail, each participant was grouped into the Academic Experts or the Company Experts (Figure 1). Both expert groups were recruited based on their positions and experience in the company or the institution each participant belonged to.

![Figure 1. Recruitment process of the Academic Experts and the Company Experts](image)

3.2. Case Study Method
A case study method was proposed for this research. It was considered as a preliminary research step in the attempt to respond to the main research question and evaluate current practicum delivery in Canadian school programs. By examining current hands-on learning opportunities available on school websites, handbooks, and practicum course outlines, additional interview questions were formed to get a deeper understanding from a dialogue with industry experts.

Purpose
This case study aims to uncover current measures for identifying a successful strategy that brings out the best practicum experiences that will prepare undergraduate students for real-world opportunities. The following steps were followed to assess the current Canadian industrial design school programs that offer hands-on learning experiences to their undergraduate students.
• The types of experiential learnings were investigated by searching for an internship or a co-operative education option that was available on the program website. There were other types of hands-on learning opportunities, such as the capstone project.

• The practicum related course codes were obtained by navigating the Bachelor of Industrial Design’s program page that was available in the undergraduate calendar. Once the course codes were obtained, each PDF document was downloaded and printed. The printouts were kept in a binder.

• One of the six schools had course information in French, which was manually translated by using a French dictionary and Google Translate tools.

• The internship related application forms were downloaded and are included in the appendices.

3.3. Interview Method

The interviews fall under one of two survey research methods to extract rich and purposeful information from a dialogue from a personal encounter (Martin & Hanington, 2012; Sinclair, 2005; Rogers, Sharp, & Preece, 2011). There are four types of interview procedures (Rogers, Sharp & Preece, 2011), including structured interviews for following a planned script, semi-structured or unstructured interviews for allowing more flexibility of probing questions (Martin & Hanington, 2012; Saldaña, 2011), and group interviews to allow discussions in a more supportive manner through a social setting (Rogers, Sharp, & Preece, 2011). Despite the varying degrees of “interview formats” (Saldaña, 2011, p.32), from structured to unstructured, interview methods in qualitative research are an effective way to collect and document what is “observed and discovered” (Saldaña, 2011, p.89) in words or visual forms (Sinclair, 2005). By collecting information through probing questions, research defines the “problem area” (Sinclair, 2005, p.98) of interest, based on the lived experience of respondents (Silberman, 2007).

In the unstructured or semi-structured interview approach for qualitative research, the range of participant’s responses can be diverse depending on the depths or breadths of individual experience with the topic (Saldaña, 2011). This diversity of individual responses in an interview can benefit research inquiries for collecting specific and focused information with reference to varying contexts (Saldaña, 2011; Sinclair, 2005). Also, with the nature of generating data
through a reflective process in an interview, the openness of the conversation often allows for a
discovery of unexpected insights or stimulates another area of insights within the research topic
(Saldaña, 2011).

In a qualitative research method, it is understood that information collected from an individual’s
experience is an “evolutionary process” (Saldaña, 2011, p.90) that cannot be judged on the
experience alone, but with “interpretation and understanding of experience that leads to
knowledge” (Friedman, 2000, p.50). While the interviews can be time-consuming (Sinclair,
2005), it offers an advantage of understanding new perspectives of an individual, incorporating
“opinions, values, attitudes, and beliefs about their personal experiences and social world, in
addition to factual information” (Saldaña, 2011, p.32). For this study, a semi-structured interview
method was incorporated to investigate the varying perspectives of academic experts and
company experts based on key interactions with students, in addition to specific tasks assigned to
students.

3.3.1. Semi-Structured Interview Method
In this research, a semi-structured interview method was selected with both open-ended and
closed questions. The interview questions were divided into four categories that highlighted
different phases of work placement duties in a company environment. This separation of
questions into different phases provided a contextual reference to the questions being asked. For
both expert types, 10-15 questions were e-mailed as an attachment prior to the recorded Zoom or
Skype meetings. This allowed the experts to prepare best responses by reflecting on the
questions. The interviews were then recorded by over Zoom or Skype over a period of 40-60
minutes.

The recruitment e-mail included the following package:

- Informed Consent Form (Appendix A)
- E-mail invitation (Appendix B)
- Two types of the Interview Questions (Appendix C and D)
- At the beginning of each Zoom or Skype meeting, the participants were guided through the
  interview process, including recording options and identification preferences for the research
  publication.
• The participants were asked to share insights based on recent experience with undergraduate students who participated in the work placement opportunities through school practica.
• For participants with indirect experience with students, some of the interview questions catered to their position and expertise.

3.4. Participant Type 1 – Academic Experts
The academic experts were selected and contacted by faculty e-mails that were publicly available on the school website. Out of six schools, five schools responded to the study and eight academic experts were finalized based on professional designations and faculty positioning in the given industrial design program (Figure 2).

![Figure 2. List of the Academic Experts](image)

The following are characteristics of the Academic Experts.
• They are currently or previously were positioned as the head of industrial design faculty or qualified professors of industrial design related practices in Canada.
• They specialized in the student work placement program as a coordinator or a practicum advisor.
• They guided undergraduate students for career developments or taught practicum courses.
3.5. Participant Type 2 – Company Experts

The companies were selected based on their global recognitions in the industrial design field. The company experts in this research were identified based on the professional designations in the company, who were knowledgeable about the company’s business operations such as the hiring process of the interns in the industrial design team. The professional designations and the company names were maintained to validate the expertise and the experience of the company experts. The following is a list of small, medium, and large companies in Canada, USA, and International countries (Figure 3).

Figure 3. List of the Company Experts

The following are characteristics of the Company Experts.

- They belong to upper management positions in the company who oversee the operation of the company and execute the full design process.
- They had direct interactions with students during an internship or a co-op period.
- Some company experts had an indirect interaction with students as a lecturer at design schools.
- They have an experience working with a multidisciplinary team in a company.
3.6. Interview Data Collection

Data was collected by asking a range of 10 to 15 interview questions based on the four key areas of research focus. The interview questions were distributed in advance to each participant to provide an understanding of research objectives and to allow time for reflection. The following key themes were discussed during the face-to-face dialogue on Zoom or Skype:

- Early Recruitment and Preparation for Work Placement
- Performance, Involvement, and Available Supports
- Understanding Challenges
- Partnership Opportunities

3.6.1. Interview Process

With participants being located all around the world in different time zones, all interviews were conducted remotely through the Zoom or Skype meeting. Special time arrangements were made to accommodate individual needs and availability.

- Prior to recording, options were addressed (face-to-face or voice).
- The length of the interviews were 40-60 minutes.
- Interviews were recorded by Zoom or Skype.
- Notes were taken manually during each interview.

3.6.2. Interview Data Transcription

After completing the interviews with the academic and company experts, each audio or video recording was transcribed manually by listening to the original Zoom or Skype recordings. A manual transcription was appropriate for this research because of the visual context that certain keywords were associated with. Once the interview data were manually typed into a Microsoft Word document, the interview data was transferred to an individual template (Appendix G) based on four key phases of the research.

3.7. Interview Data Analysis Process

By using a thematic analysis (Saldaña, 2011), patterns in words such as recurring verbs and nouns from the interview responses were extracted. This approach was successful in identifying important observations made by experts during past and current internships.
CHAPTER 4. DATA COLLECTION

4.1. Case Study Data

A total of six Canadian undergraduate industrial design programs were examined based on their four-year degree programs (Figure 4).

Each school practicum program was reviewed based on different types of hands-on opportunities that were available for the undergraduate students between 3rd and 4th years. Practica related course information was collected and documented in Microsoft Excel (Figure 5).

<table>
<thead>
<tr>
<th>Carleton University</th>
<th>Emily Carr University</th>
<th>Humber College</th>
<th>OCAD University</th>
<th>University of Alberta</th>
<th>Université de Montréal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Faculty Positioning</strong></td>
<td>Engineering &amp; Design</td>
<td>Design</td>
<td>Applied Sciences &amp; Technology</td>
<td>Design</td>
<td>Art &amp; Design</td>
</tr>
<tr>
<td><strong>Program Length</strong></td>
<td>4 Years</td>
<td>4 Years</td>
<td>8 Semesters (9 Years)</td>
<td>4 Years</td>
<td>4 Years (4 yrs)</td>
</tr>
<tr>
<td><strong>Practicum Title</strong></td>
<td>The Industrial Practice Internship</td>
<td>Practicum Course</td>
<td>Integrated Field Placement, GDES-3104</td>
<td>Work Placement [DSN 3519]; WORK 3550</td>
<td>DIN 4420 Pratique professionnel, DIN 5012 Directed Work</td>
</tr>
<tr>
<td><strong>Practicum Types</strong></td>
<td>Internship [GDES-4400] or Co-Op work term</td>
<td>Practicum Course (3.0 credits)</td>
<td>Field Placements (Internships), Experiential Learning [GDES 3104]; Design (paid, non-credit)</td>
<td>Co-Op, Mandatory Work Placement</td>
<td>Co-op and internship programs, industry-led projects and collaborations both within and outside of the University (ECU Institutional Accountability Plan Report 2018/19, p. 16)</td>
</tr>
<tr>
<td><strong>Length of Practicum</strong></td>
<td>12 Weeks</td>
<td>13 Weeks</td>
<td>430 hours, 14-week</td>
<td>5 semester course (WIL)</td>
<td>5 weeks</td>
</tr>
<tr>
<td><strong>Eligible Student Level</strong></td>
<td>Years 3 &amp; 4</td>
<td>Years 3 &amp; 4</td>
<td>Years 3 &amp; 4</td>
<td>Years 3 &amp; 4</td>
<td>Years 3 &amp; 4</td>
</tr>
<tr>
<td><strong>Faculty Name</strong></td>
<td>Faculty of Engineering &amp; Design</td>
<td>Faculty of Arts Department of Art &amp; Design</td>
<td>Faculty of Design, Industrial Design</td>
<td>Faculty of Applied Sciences &amp; Technology</td>
<td>FACULTÉ DE L’AMÉNAGEMENT, ÉCOLE DE DESIGN (Faculty of Environmental Design, School of Design)</td>
</tr>
<tr>
<td><strong>Practicum Support Office</strong></td>
<td>School of Industrial Design, 3470 Mackenzie Building, 125 Colonel By Drive Ottawa, Ontario, Canada K1S 5B6</td>
<td><strong>Only University in Canada to have Research Chair in Design Studies</strong></td>
<td><strong>CEAD, Centre for Emerging Artists &amp; Designers</strong></td>
<td><strong>Summer internship - mandatory stream</strong></td>
<td><strong>Unable to locate information on website.</strong></td>
</tr>
<tr>
<td><strong>Facilitator Contact</strong></td>
<td>Director, Associate Professor</td>
<td>Associate Professor and Industrial Design Coordinator (retired)</td>
<td>Chair of Industrial Design, OCAD</td>
<td>Program co-ordinator (email on Oct. 12th)</td>
<td>Co-op office, Emily Carr</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TGIE - Renseignements généraux (General Information)</td>
</tr>
</tbody>
</table>

Figure 4. Six undergraduate industrial design programs in Canada, 2021-2022

Figure 5. Documentation of undergraduate industrial design practica
Case 1. Carleton University

Bachelor of Industrial Design | School of Industrial Design | Faculty of Engineering & Design

**Figure 6. Practicum related courses at Carleton University’s ID program**

*Program Description*
Options to pursue hands-on experience include co-operative education, internships, or exchange programs. An internship is a requirement to graduate from the industrial design program. “Carleton also has a co-op program, which starts earlier in the year. There are costs associated with the co-op and requires a student to do more terms of study. The internship is divided into two separate complementary parts; the internship placement and the completion of the course IDES 4400. The practicum course can only take place after the internship completion” (Director, Carleton University, 2021).

IDES 4400 | Internship Field Report
[Credit Course]
- 12 weeks
- Supervised at Job
- Design Related

IDES 4310 | Capstone Project
[Credit Course]
- Experiential Learning
- 6 hours/week in Fall
- 12 hours/week in Winter

IDES 4002 | Professional Practice
[Credit Course]
- 1 Semester Course
- Guest lecturers

IDES 4400 | Internship Field Report
This is a practicum course that includes the experiential learning activity. In this credit course, students write and document their internship experiences. This course is associated with writing, editing, reflection, and documentation (Carleton University, 2021).

IDES 4310 | Capstone Project
Application of design principles in a comprehensive design project. Problem area should be product-oriented and of sufficient complexity. Normally undertaken in consultation with off-campus organizations and/or industry. Supervised by faculty and/or sessional members (Carleton University, 2021).

IDES 4002 | Professional Practice
Topics include: The form of contracts for consultancy, determination of fees, legal implications, patents, and copyrights (Carleton University, 2021).
Available Supports

There are internship information sessions for 3rd year students, portfolio events, and laboratories (Metal Shop, Wood Shop, and Soft Lab).

**Case 2. Emily Carr University**

Bachelor of Design | Industrial Design Major | Faculty of Design

<table>
<thead>
<tr>
<th>INDD 419</th>
<th>Graduation Workshop</th>
<th>[Credit Course]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Portfolio Preparation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Professional Internship</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Individual Projects for Grad Exhibition</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CO-OP</th>
<th>Co-operative Education</th>
<th>[Can Apply for Credit]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Full-time/Part-time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Paid ($15-to-$25 per hr.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Winter/Summer/Fall</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WIL</th>
<th>Work Integrated Learning</th>
<th>[Can Apply for Credit]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Minimum of 3.0 GPA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Job Board or Self-directed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Industry Events</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Build Industry Skills</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 7. Practicum related courses at Emily Carr University’s ID program**

*Program Description*

Examples of some skills in the Emily Carr University Industrial Design Program included the following (Emily Carr University of Art + Design, 2021):

design process, hand drawing, modelling techniques, presentation skills, strategic and critical design thinking, and software skills (3D CAD, Solidworks, Rhino 3D, Fusion 360, MODO, and Grasshopper). Students also learn digital fabrication, 3D printing, prototyping, textile design, wood product development, critical making, freehand drawing, drafting, and design for mass production throughout the program.

Available Supports

The shops and studios include Wearables & Interactive Products Lab, Flexible Materials Lab, Metal Shop, Soft Shop, and Design Wood Shop (Emily Carr University of Art + Design, 2021).
Case 3. Humber College

Bachelor of Industrial Design (B.I.D.) | Industrial Design | Faculty of Applied Sciences & Tech.

**Figure 8. Practicum related courses at Humber College’s ID program**

Available Supports
There is a web portal to access the employment opportunities, online tools to upload the portfolio and the resume. The past hands-on opportunities included Design Trips to Europe, Japan, Germany, and other international locations (Humber College, 2021).

Case 4. Ontario College of Art and Design (OCAD University)

Bachelor of Design | Industrial Design | Faculty of Design

**Figure 9. Practicum related courses and opportunities at OCAD University’s ID program**

GDES-3104 | Internship
This experiential learning work placement provides an opportunity to develop networking abilities and career objectives. An internship will be proposed and conducted with an art/design studio, industry, or community partner. In preparation, certain tasks will be assigned before the course begins. Classroom activities led by the instructor and assisted by the Centre for Emerging Artists & Designers take place to assist with internship preparation and reflection. Due to the
independent nature of the course, self-motivation and time management skills are paramount (OCAD U, 2018).

Field Placement Course
This is an independent and self-directed placement opportunity for undergraduate students in Industrial Design. In this course, the duties include attending ongoing meetings with OCAD University’s faculty member during this experience (Figure 10). A difference between the GDES-3104 and a Field Placement course is that the Field Placement involves only one student and one faculty member (OCAD U, 2018).

![Figure 10. Triangulation Method during Field Placement Program at OCAD University](image)

Available Supports
There are Centre for Emerging Artists & Designers and Career Launchers Program (OCAD U, 2018).

**Case 5. University of Alberta**
Bachelor of Design | Industrial Design | Department of Art and Design

**Design Practicum**
- Practical Work Experience [Credit Course]
  - Optional Internship
  - Unpaid
  - 13-week (91 to 104 hours)
  - Fall/Winter; Spring/Summer
  - 1 Term Course, Final Report

**Other Opportunities**
- International Exchange
- Study Abroad (Australia, Germany, China)
- Local, National, International Design Shows

![Figure 11. Practicum related courses and opportunities at University of Alberta’s ID program](image)
Program Description

The University of Alberta is the only university in Canada to have a Canada Research Chair in Design Studies. The unique design program provides an opportunity for students to explore their Design Routes during undergraduate studies in the Bachelor of Design. Such routes include, Business and Marketing, Social Sciences, Engineering, Computing Sciences, Printmaking, or the General Route. During senior years in undergraduate studies, students can participate in a practicum course to get real-world experience (University of Alberta, 2021).

Design Practicum | Optional Practical Work Experience

Upon registration, each student is paired with one faculty member who acts as a supervisor. Students have the responsibility to find a prospective employer of interest. The uniqueness to the practicum is that the school focuses on student successes rather than failures. Supervisors from the faculty determine the best match by observing students during in-class assignments where their strengths would best fit based on portfolio and interests. The practicum course is restricted to students in their final year and includes a final presentation (University of Alberta, 2021).

Available Supports

There are prototyping workspaces, 3D printers, and CNC routers.

Case 6. University of Montreal (Université de Montréal)

Bachelor of Industrial Design | School of Design | Faculty of Environmental Design

Stage en entreprise [Credit Course]
- 5 weeks, 200 hours
- Companies
- Organizations
- Research Centres

Projet de fin d’études (PFE) 2 [Credit Course]
- Mandatory Course
- Final Year Project
- Team Project

Pratique Professionnelle [Credit Course]
- Mandatory Course
- Professional Practice
- Occurs in 4th Year

International Exchanges with Affiliated Schools
Business Partnership Opportunities
Graduating exhibition (EFFA 21)

Figure 12. Practicum related courses and opportunities at University of Montreal’s ID program
Program Description

Université de Montréal is the only school in Québec that awards a Bachelor of Industrial Design degree. Positioned in the Faculty of Environmental Design, students are exposed to a variety of industry projects through partnerships with private and public organizations. The program combines theory, including human factors such as ergonomics, psychometry, and semiotics, with each of design project phases. Upon completion of the degree, students and future design professionals will gain the knowledge and skills that support the industrial design in the following areas (Université de Montréal, 2021).

- les matériaux | materials
- les facteurs humains | human factors
- les nouvelles technologies | new technologies
- l'écologie industrielle | industrial ecology
- l'infographie et la communication | graphic design and communication
- l'histoire du design | design history

Available Supports

There are ‘Ateliers de Prototypes’ (Prototype Workshops).

4.2. The Interview Questions

In addition to collecting information on the process of practica offered by Canadian industrial design programs through online handbooks and school websites, a discussion with the industry experts in an interview supported a deeper understanding of critical roles and interactions for student learning and professional development. Prior to each scheduled meeting on Zoom or Skype, each participant was provided with an interview package that included the formal e-mail invitation letter, informed consent form, and 10-15 interview questions.

As part of the interview package, a list of the interview questions was e-mailed to each participant to provide an overview of research scope by themes. There were four different phases of practicum process for the participants to navigate the study from user perspectives, allowing discussions for focused issues and challenges around the topic that they were experienced with.
Sharing the interview questions with participants prior to the Zoom or Skype meetings helped the industry experts reflect and prepare critical discussions for scheduled interviews.

To assess the success measures of practicum opportunities in two different learning environments, the interviews were separated into two distinct expert groups, the Academic Experts and the Company Experts. Both expert groups had similar themes in terms of the stages of practicum process for the undergraduate students. However, the interview questions were catered more specifically to the environment where the opportunities were offered (Figure 13 and 14).

Phases 1 and 2 were categorized differently because participants come from two different work environments that have slightly different administrative process. The categorizing was intended to make this distinction, whereas the initial learning is provided in schools and knowledge is transferred to company projects through a practical learning.
Figure 13. Practicum Advisor Interview Questions

Phase 1. Preparation for Work Placement
1. Can you please give an overview of the practicum process for your industrial design program?
2. What type of efforts are made by your program to assist students to obtain desired work placement opportunities?
3. What steps do you take to encourage students to prepare for specific job requirements set by the corporate career posting?

Phase 2. Available Support
4. What skills do your industrial design students acquire from the program that they can apply to work placement?
5. What type of new skills and industry knowledge have your students acquired after the work placement experience?
6. How have your students applied new knowledge from work placement into practicum reports or final projects?
7. Were there any new learning opportunities at work placement reported by your students? (i.e., design software use, plant tour)

Phase 3. Understanding Challenges
8. What were some of the early challenges identified by students as work placement started? (i.e., misunderstandings, etc.)
9. What were some of the challenges identified by students during given projects at work placement? (i.e., learning manufacturing standards, vendor contact, etc.)
10. Can you provide an example where students in your industrial design program faced challenges in advancing certain skills required for work placement?

Phase 4. Partnership Opportunities
11. Has your industrial design program collaborated with corporations in the past for other hands-on opportunities for student learning?
12. Do external partners offer other hands-on opportunities or activities for students apart from the practicum? (i.e., guest speaker series, workshops, portfolio review etc.)
13. Does your industrial design program have plans to incorporate new opportunities to enhance practicum experience?

Figure 14. Company Interview Questions

Phase 1. Early Recruitment Stage
1. Does (insert company name) hire student interns from industrial design programs? (i.e., aside from a great portfolio)
2. What attributes or qualities stand out the most in students?

Phase 2. Project Involvement and Performance
3. How have your previous students transitioned from entry level to experienced level, at the end of the work placement? (i.e., progress)
4. How do students apply academic skill sets for fulfilling duties in company projects? (i.e., PowerPoint skills, etc.)
5. What types of duties are assigned to students during the internship period? (i.e., early conceptual to project launch)
6. How does your corporation evaluate student work performance?
7. After hiring students, how much student contribution did the projects receive during the internship period? (i.e., 4 months internship period)

Phase 3. Understanding Challenges
8. What are some common student mistakes or errors that can occur during various project phases?
9. What factors would hinder and delay students to move forward to the next step during assigned tasks? (i.e., moving from concept to development)
10. How much supervision do students require during assigned tasks?
11. What advice do you have for students with no experience or very little exposure to the industry?

Phase 4. Partnership Opportunities
12. What types of educational partnership has your company previously supported to industrial design programs? (i.e., design workshops, keynote, design competitions, etc.)
13. Have you considered future partnerships with other industrial design programs regarding student work placement opportunities? (i.e., hands-on training)
4.3. Interview Data

For the interviews, each participant was identified according to one’s professional designation and the name of the organization and level of expertise in the industrial design industry. Based on individual expertise, each participant shared insights on successful examples of student learning opportunities and challenging areas associated with work placement activities. In the interview data of the participants, each expert’s information on background, insights, and discussion direction were significant components that presented common industry concerns regarding practicum delivery.

A template was created for the interview data. It was set up this way to understand how their interview responses reflect and validate their experiences as experts.

<table>
<thead>
<tr>
<th>School Name</th>
<th>Company Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Designation</td>
<td>Professional Designation</td>
</tr>
<tr>
<td>Background</td>
<td>Background</td>
</tr>
<tr>
<td>Insight on Practica</td>
<td>Insight on Practica</td>
</tr>
<tr>
<td>Discussion Direction</td>
<td>Discussion Direction</td>
</tr>
<tr>
<td>Interview Data in 4 phases</td>
<td>Interview Data in 4 phases</td>
</tr>
</tbody>
</table>

**Figure 15.** Interview Data Template for Participants

4.4. Practicum Advisor Interviews

The characteristics of the following academic experts were based on the departmental association with the industrial design program or interactions with industrial design undergraduate students who applied for internships or field placements. Each participant played major roles in advising and supporting students to pursue practicum opportunities for hands-on learning. A total of eight practicum advisors from the industrial design programs responded to the recruitment e-mail.
Background
As a director of industrial design program at Carleton University, the participant is an active product designer, researcher, and author of several publications. His research interests in community-oriented design have led a number of fourth year industrial design classes undertaking innovative and collaborative project ideas in Africa and Uganda. He holds a Mechanical Engineering degree and Master of Science in Engineering (MSE) in product design from Stanford University.

Insight on Practica
The director notes, “internship is a mandatory experiential learning component of program and integral part” for industrial design undergraduate students at Carleton University. A common challenge area is that students need extra time to learn during the given internship period. Due to this limiting situation of the internship period, students are unable to contribute to making a proper transition of work to another employee at the company towards the end of the internship. One of the successes at Carleton is that there is flexibility for any design related opportunities such as Interior Design, UX, UI, or app development.

Discussion Direction
The discussion was followed by answering the last questions on partnership opportunities. Currently, Carleton University offers summer research internship opportunities to the graduate students. It would be ideal to align fourth year undergraduate projects with research internships every summer that could expand into graduate level studies. Another suggestion made by the director was the need for an industry liaison person for internship development and growth with industry sectors including federal government research opportunities and healthcare sectors.
Interview Data

Phase 1. Preparation for Work Placement (Skills and Attributes)
- Documenting, writing, editing, researching, and reflecting (deep thinking) were core activities associated with the coursework (IDES 4400) taught by the director. They are important skill sets students can transfer to the internship, other than having the common software skills like CAD and Illustrator to do rendering. The director stated, “everything they learn in the program is applicable in the internship”. Students may not realize they have many capabilities to apply to the internship from the course teachings.

Phase 2. Available Supports
- Carleton offers on-campus resources such as a Co-op Office and Career Centre.
- Students learned by observation at a company facility watching certain industry processes through factory technicians or craftsman.

Phase 3. Understanding Challenges
- There were ethical and legal concerns regarding the work placement selections. Students do not have the same professional experience as the employer, so it is required that students are supervised appropriately for the assigned tasks. The frequent mention of the term ‘appropriateness’ suggested that both students and the employer meet this expectation.
- There were minor behavioural concerns addressed for some students, such as learning to manage time more effectively and dressing and acting appropriately.
- There may be a lack of exposure and connection to technical training in the company, such as the opportunity to work with engineers and factory technicians who have different skill sets from designers. There are also situations when students unexpectedly meet different stakeholders or experience sudden changes in teams.
- A feeling of Impostor Syndrome could be present during the internship experience. The participant sometimes felt that students had unrealistic expectations to know everything. Getting student perspectives on job expectations allowed the practicum advisor to be more connected with students through a conversation.
Phase 4. Partnership Opportunities

- Recruiting more professors with industry focus would be beneficial to student hands-on learning.

4.4.2. Emily Carr University
Program Assistant, Career Development and Work Integrated Learning (WIL)

Background
The participant works in the office of Career Development and Work Integrated Learning (WIL) and has decades of experience with industrial design students and alumni working towards career goals.

Insight on Practica
What is unique about Emily Carr University is that it is an optional elective credit for students to pursue interdisciplinary work placement opportunities. A practicum is not a requirement because it is there to “enhance the degree program”; however, students are encouraged to participate in industry events through curricular and co-curricular learning. The alumni connections have been very successful for work placement opportunities. When concerns are brought into the Career Development and Work Integrated Learning office, “problems are resolved very quickly”.

Discussion Direction
Emily Carr is “always working to enhance the student experience and connect students to opportunities that will inform their practice as well as assist in professional development”.

Interview Data
Phase 1. Preparation for Work Placement (Skills and Attributes)
- Undergraduate students at Emily Carr exit the classroom with a breadth of skill sets including software use and knowledge, foundations, digital tool kits, understanding of marketplace, tactile experience through material exploration, and industry relations.
Phase 2. Available Supports
- The placement advisors maintained a strong relationship with industrial design students taking co-op and work integrated learning.

Phase 3. Understanding Challenges
- Some common challenges undergraduate students experienced during placements were not associated with learning skills or tasks, but rather placement satisfaction, such as “mentorship and renumeration”.
- The timing and responsiveness to difficult situations were very crucial for preventing further challenges to students. The participant mentioned that it was very rare for past participants to have challenges with employers because they were top students.

Phase 4. Partnership Opportunities
- There are industry supports as part of curricular and co-curricular learning.
- The Emily Carr University encourages the students to participate in hands-on opportunities to enhance academic experience.
- The Emily Carr University always seeks to enhance student experience and connect students to opportunities that will help them develop professionally.

4.4.3. Humber College Institute of Advanced Learning and Applied Technology
Professor, Program Coordinator, Industrial Design

Background
This participant holds a PhD degree in Materials Science and Engineering at University of Toronto. With his strong background in Engineering, he has implemented manufacturing components into curriculum for an emphasis on production. His experience also includes advising students with academic development and organizing other hands-on learning opportunities such as the Design Trip to Europe in past years.
Insight on Practica

Industrial Design students at Humber College leaves the school with “good breadth of skill sets and common software knowledge”. These skill sets are successfully featured in Humber Industrial Design program’s two major shows: Thesis Show and Chair Show. Students are “well connected”, and the practicum is well managed that “situations don’t come up”. The challenge in a practicum course is that students are not graded on the practicum even though internship is a mandatory stream for all industrial design students. A change of deliverables and change of format should be incorporated into the practicum course. One concern about placement is that some companies lack professionalism where workplace safety is not properly controlled.

Discussion Direction

The participant wishes to add student entrepreneurship opportunities to the industrial design program as an addition to the practicum. He gave an example of an “innovative government lab” setting up start-up companies, asking “Can we in a program do the same?”

Interview Data

Phase 1. Preparation for Work Placement (Skills and Attributes)
- Having an entrepreneurial mindset during coursework would prepare students to understand business prospects during an internship.
- Humber has a strong history of technical skills, where students are very prepared with CAD skills, writing skills, and work well under tight deadlines.

Phase 2. Available Supports
- Local industry affiliations were mostly available, except for faculty members participating in IDSA events. Global affiliations seem to benefit the faculty more than students.
- Shared Network: Job portal for portfolios and for potential employers to post jobs (50% of students use this platform).
- Video chat, WhatsApp, Blackboard Collaborate at Humber. Using tools from the workplace like Mural software platform.
Phase 3. Understanding Challenges

- A sufficient level of professionalism was missing in some companies when speaking inappropriately with interns. One employer assigned inappropriate tasks like personal errands, babysitting for example, and asking students to complete other tasks rather than design related work.
- Work placement safety was another concern when it came to harassment or insulting the interns. Students need appropriate guidance and to feel safe at a work placement.
- Uniqueness of students determined different challenges, including occasional language barriers like the ability to communicate easily in English.
- Biggest challenge was that there was no grading associated with the practicum course. Hence, student efforts had varied outcomes in coursework.
- There are policies associated with the Ontario Government such as the Pan-Canadian Assessment Program system. It needs to be officially monitored and assessed.

Phase 4. Partnership Opportunities

- Past partnerships include a trip to Monserrate manufacturing plant and a design trip to Europe for 10-12 days including Italy, England, Scandinavian countries, Germany, and Japan.
- There were internship partnerships for 26 years with ABC Tech. Also, there are internship partnerships with Canadian Tire and Umbra.

4.4.4. Humber College Institute of Advanced Learning and Applied Technology
Manager, Work Integrated Learning (WIL); Manager of Co-op and Work Placement Services, Work Integrated Learning (WIL) Office, Faculty of Applied Sciences and Technology

Background
This participant holds a Chemical Engineering degree at Queen’s University. Her human resource experience in a high-tech background enabled the participant to look for opportunities in firms like Motorola, which included recruiting candidates and seeking best interests for company needs. After that, she moved onto her own consultancy firm helping companies and
employers with staffing, recruitment, employment equity plans, and many other opportunity roles with technical firms. At Humber College, the participant has been working with students for 17 years as a co-op and work placement service manager, career coaching and enhancing student job search experience with available supports.

**Insight on Practica**

The major difference in university and college industrial design practica is the breadth of program. Some of the unique advantages being at Humber College is that students come away with strong entrepreneurial and engineering skill sets that many companies desire in eligible candidates. The mandatory internship or work placement program at Humber Industrial Design program has transformed over the years to tailor practical knowledge to align with their thesis project in fourth year. Humber’s Industrial Design practicum takes an integrated learning approach with a combination of graphic design and technical faculty, allowing undergraduate students to develop personally. Work integrated learning is more than working, more than showing up for 8 hours. It’s about reflective thinking, work experience will validate what they knew about before and articulate themselves. Humber has the niche, the blending of business and creativity. Employers have said that Humber students have the ability to make things.

**Discussion Direction**

A representative from Humber Advisory meeting mentioned about an ongoing graduate employment in the field of industrial design for PhD students. Upon 5-10 years of being in the industry as industrial designers, there seems to be few opportunities due to financial difficulties of retaining a higher salary. Companies nowadays tend to hire recent graduates with lower salaries. We see them move into small design firms. We deal with industry for a long time, who are presidents or design firms. There are not a lot of people in the middle of their profession seemingly working for small firms, “so where do they go?”

**Interview Data**

Phase 1. Preparation for Work Placement (Skills and Attributes)

- Having transferable skills such as strong writing skills, which are shown in final reports.
- Student motivation and confidence are promoted.
Phase 2. Available Supports

- There are currently more mentorship opportunities between faculty and students, not from students to students.
- At the Centre for Entrepreneurship, there are teams for employer outreach, industry liaisons, job development, career events, and networking events with employers on campus prior to COVID-19. The job matching probability is 1-2 jobs per student.
- Other hands-on opportunities included working overseas in manufacturing facilities such as Southeast Asia (China, India, Malaysia). A few students worked in Europe, New Zealand, and Australia in the past.

Phase 3. Understanding Challenges

- No hiring incentives for students at work placement, but a lot for co-op students. Paid internship is encouraged more for students. Mandatory internship should be in place.
- Having a strong mentorship network would engage first-year students to discover supports outside the faculty.
- Students need more coaching in the job search. Communication skills were highlighted in the interview as some students shy away, not being self-aware and have emotional disconnection with the work placement.

Phase 4. Partnership Opportunities

- Past industry collaboration with Automotive Parts Manufacturing Association (APMA). Two students were involved in the research projects.
- There are external competitions such as Bombardier Award, and also worked with other organizations for studio projects.
- Alumni connection was positive, where students seemed well connected in two ways; one way is by moving up in a company as a hiring manager within 2-3 years of graduation, and the second way is by returning to school to recruit recent graduates.
4.4.5. OCAD University
Chair, Industrial Design

Background
Trained as a high school teacher, in public education. On top of his teaching career and degree in Master of Education at York University, the participant comes from a multi-disciplinary practice including industrial design, furniture design, technical direction, and production management in professional performing arts. He supervised 4 different groups of students who were selected for internships based on skills. He also managed set building companies for movies and television. After his completion of a Furniture Diploma at Sheridan, he went to OCAD University for an industrial design degree. The participant worked his way up to be a Chair of the program. His advice to interns is to “have practical experience on how to work with people.”

Insight on Practica
There are three types of undergraduate industrial design practica at OCAD University: GDES - 3104 (internship), Field Placement, and the optional internship called Design4. Within these three streams, the biggest challenge in the work placement experience is what the job market expects for the preparation of tangible work. Students are not aware of workplace dynamics and interactions that happen outside the classroom environment. Internships should be mandatory, happen earlier, and government should mandate industries to create internships. Other challenges included unpreparedness of some placements in terms of providing the parameters of workflow to students. One of the strengths as a smaller university is that everyone is well connected to direct students to available supports. The participant also added that an advantage for a smaller learning environment is the ability to collaborate and learn from each other, “pedagogy is what happens between students”. He is currently working on rebuilding the program and introducing peer mentorship to industrial design undergraduate students.

Discussion Direction
With the difficulty of getting students experience outside the classroom, the participant wishes to develop more industry relations that could potentially bring in more assignments and cash
competitions to motivate students to participate in real projects. “How do I get the industry involved more with our students, and what will the university start to look like in the future?”

**Interview Data**

**Phase 1. Preparation for Work Placement (Skills and Attributes)**
- Being motivated and gaining industry experience were very important discussions in the interview.
- Communication skills, time management skills, technical skills (i.e., Solidworks, coding, Rhino, Fusion 360), presentation skills, and networking skills were highlighted.

**Phase 2. Available Supports**
- Experiential Learning (unpaid), Field Placement (internship), and Design4 (paid) were the three types of practica at OCAD.
- Advantage of being a smaller university is that the communication within departments is open. It is easier to direct students to resources, offer suggestions, and act quickly.

**Phase 3. Understanding Challenges**
- Mentorship structure needs to be reconsidered within the learning environment. There was no clear mentorship structure between students to share experience, work collaboratively, and learn from each other.
- Industry partners should introduce real and achievable goals to students. This can create unrealistic expectations in students.
- The word “dynamics” was mentioned frequently. Participant felt that students have difficulty understanding workplace dynamics, learning different interactions in a company, how to engage, and understand the workflow.

**Phase 4. Partnership Opportunities**
- OCAD was in the process of rebuilding their program. Participant wants to get students to think of which area in industrial design they want to engage in and have a specialized focus in the discipline. For example, UX or UI, or service design.
• Past industry partnership with DesignTo, Design4, and CEAD.
• Would like to make the internship mandatory. Want to find own internship and get the job experience. Good to have a list students can choose from. Get experience prior to leaving school which is very important.
• The participant wishes to develop a network with Ontario industrial design society and government, build capacity, so universities can apply for funding for internship development.

4.4.6. OCAD University
Former Associate Dean, Associate Professor, Faculty of Design

Background
Between 2018 to 2020, the participant held positions at OCAD University as an Associate Dean, Academic Affairs in the Faculty of Design, supporting students internally, actively involved in strategic projects and outreach activities. Prior to OCAD, she had over 20 years of academic career, teaching at various universities, supporting and promoting research initiatives, academic and industry partnerships, and collaborative opportunities.

Insight on Practica
What is unique about OCAD’s practicum experience is that it is not as traditional as the required internship or co-op at technical schools. At the Centre for Emerging Artists and Designers (CEAD), a wide range of students are supported for different career interests and finding the best fit for the opportunity. This relationship works well in the experiential learning model where industrial design students are paired up with any faculty member to be the student mentor for the semester. OCAD students have a lot of support coming from alumni network and school resources. The main challenge with undergraduate students was an inability to navigate like the graduate students that comes with more life experience and education.

Discussion Direction
One of the components to be added to the industrial design practicum was increasing the opportunity to all students. Currently, only a limited number of students are able to apply for the
internship on a first come, first served basis. Therefore, more industry partnerships for placement opportunities would benefit not only the students but would also benefit the university to develop its program. Industry partnerships can also grow into faculty level for knowledge development in design education.

**Interview Data**

**Phase 1. Preparation for Work Placement (Skills and Attributes)**
- Leadership skills, more of a mindset than certain skills that students possess.
- Attitude allows students to grow from a job to a career, not so much in the skills they possess.
- Writing, time management skills, developing confidence and collaborative skills for group projects towards a mutual goal.

**Phase 2. Available Supports**
- CEAD at OCAD. Support a wide range of needs from artists to other creative fields such as industrial design students who want to get into a different discipline. Departments collaborate with other disciplines if students find other opportunities elsewhere.

**Phase 3. Understanding Challenges**
- An equitable experience was mentioned frequently in the interview. The participant sees that there are limited opportunities for students getting good internship experience. Part of the reasons is that not every student understands the value of internship and it is administratively intensive for a smaller institution.
- Navigating the reality, “behind curtains” of everyday tasks in a company environment. The use of metaphor refers to learning that is difficult to teach in schools, which can be experienced with time. This can be resolved by having support from an alumni network.
- There should be fundings with Ontario contract and partnerships with operating costs.

**Phase 4. Partnership Opportunities**
- Vice President of Johnson Controls came to school to introduce a classroom project. The work was critiqued by their multidisciplinary teams and students were also invited back.
• Partnership with Design TO exhibition. Students also participated in a community-based engagement with CAMH with mental hospital in the exhibit. Joint fourth year project to showcase externally and expose them to the industry, and other sectors of the creative field (architects, interior designers, and furniture designers).

• Internship with Umbra: International relationship with manufacturing. Critical thinking is involved throughout internship by connecting production requirements with those facilities overseas. How is it communicated? How do you develop relationship with local or global manufacturer?

• Global opportunities: Faculty exchanges doing research and projects together with University of Arts London, knowledge development at faculty level.

## 4.4.7. OCAD University
Coordinator, Experiential Learning, Centre for Emerging Artists and Designers (CEAD)

**Background**

The participant has five years of experience as a corporate recruiter and manages partner relations for new and existing placement opportunities. As a coordinator of Experiential Learning at Centre for Emerging Artists and Designers at OCAD University, the participant provides student supports and guidance to any students that show interest in pursuing placement opportunities for course credits.

**Insight on Practica**

*Experiential Learning* has a framework of specialized industry focus with part-time opportunities to students in a short period of time with an emphasis on self-exploration, experimentation, and mentorship. The length of this practicum for an Industrial Design program is insufficient for student learning. It would improve the work experience if the *GDES-3104 Experiential Learning* course expanded into a longer length for a partner company to benefit as well, apart from the co-op model. Suggestions included encouraging students to be more curious by adding assignments that could open a door to opportunities and providing more preparation support like the informational interview sessions as an optional component. Students are busy taking other
courses while taking placements. However, the participant advises students to be more curious and aware of all experiences around them, other than schoolwork. “What drives them to do the things they want to do?”

Discussion Direction
Having rich alumni connections and available toolkits through Career Launchers Program, this service had allowed upper-level undergraduate students to remain curious about new opportunities. OCAD University always reaches out to new partners, finding different levels of engagement for partners and students.

Interview Data
Phase 1. Preparation for Work Placement (Skills and Attributes)
- Soft skills like communication skills, time management, and client management skills were discussed. Certain skills are not taught in school. Students don’t get much exposure to these skills in a school setting.
- Other recommended skills for an internship included graphic design skills and industrial design skills.

Phase 2. Available Supports
- Triangulation: Strong mentorship is evident between a student and a faculty member during a field placement experience. One on one conversation happens. A lot of conversations happen between faculty and students to discover talents and student needs for learning opportunities.
- Outreach to alumni network for internship opportunities to stay connected.

Phase 3. Understanding Challenges
- A lot of coaching is needed for students to build a confidence in the portfolio work.
- Confidence was mentioned throughout the interview. Participant felt that a lot of students had unrealistic expectations, which can be barriers for improving their learning. The balancing act of having moderate confidence was important, as over-confidence showed in some students.
• Understanding student emotion was emphasized during the interview such as, “comfortable, feel timid”. This indicated the role of supervisor by identifying the action verbs used in the interview such as, “encourage, reach out”.
• Work placement lengths are short for comprehensive learning at work placement and often unpaid for academic credit (currently 80-120 hours).

Phase 4. Partnership Opportunities
• Alumni relations were considered important.
• There were industry events such as the Design TO, Design for Health, Design4, and CEAD.

4.4.8. University of Alberta
Professor and Program Coordinator (retired), Industrial Design

Background
The participant practiced as an industrial designer in Sydney, Australia prior to joining University of Alberta. His speciality is in medical design and working with graduate students.

Insight on Practica
A practicum course at the University of Alberta is an optional pathway for undergraduate industrial design students. There is only a small number of industrial design students who take advantage of that opportunity, approximately 6 to 8 per semester out of 30 students in the graduating class. Students in the industrial design programs acquire similar skills in terms of the sketching abilities and learning the CAD software, but the ones who completed the practicum produce more focused portfolio. Some of the main challenges of students during a practicum included transitions from a nurturing environment to the real workforce, but that is considered part of the learning process through a practicum. “Where do you see it going forward?”

Discussion Direction
Participant addressed the shortness of the practicum course which is about 13 weeks, or 3 months in a company. Students take other courses during a practicum and getting full exposure to work
experience requires more time. Another area of the practicum improvement was mentioned by the participant with regards to development of a design network through industry partnerships. Edmonton has a small industrial design community, mostly architecture and engineering firms in the city. Participant believes in more successes than failures by aligning student interests and the niche a company operates in.

*Interview Data*

**Phase 1. Preparation for Work Placement (Skills and Attributes)**
- Skills are similar from students to students. The purpose of a practicum is to give more focused career direction. Students have more focused portfolio after a placement experience.
- Highlighted technical skills were CAD, drawing, research, understanding of ergonomics, human factors, drawing, processes, methodology, writing skills through journaling and report writing. Participant encouraged students to reflect on their new learning from a company.

**Phase 2. Available Supports**
- Practicum is used as a tool to develop relationships outside of the classroom.
- The career matching services are available.

**Phase 3. Understanding Challenges**
- Students have naïve inquiries towards design problems.
- Students should not take practicum to fulfill a credit requirement. It should be regarded as a tool to discover career options and be a role model for the program.
- Length of practicum was addressed. Participant wishes to extend from 100 hours or 13-week engagement, such as students emerging full-time at a company for three months.

**Phase 4. Partnership Opportunities**
- Past partnership with City of Edmonton and student design association to organize local events with local designers to lecture on particular projects.
- Past placement partnerships with Stantec, some architectural firms, design shows in NYC and in Milan.
• Local partnerships with furniture design companies, product design, engineering firms, and some design companies.
• Past exchange programs with University in Germany and summer programs with Berlin.

4.5. Company Expert Interviews
A total of thirteen company experts have responded to the recruitment e-mails. The company experts consisted of various sizes of teams and workplace dynamics who were globally recognized. These company experts were based in Canada and internationally.

4.5.1. Canadian Tire Corporation
Associate Product Development Manager

Background
Over eight years of employment at the Canadian Tire Corporation, the participant had interactions with approximately six interns, all within the past two and half to three years. As a leader in a product design and development team of 30 people, the participant oversees the design process from the early conceptual stage to launching a product launch in the market. Throughout his career, the participant registered patents on numerous products. The participant has worked in diverse industry areas including toy, healthcare, furniture, and companies such as Apple and RIM.

Insight on Practica
Having a good structure at a company helps students with learning. All interns have similar challenges in terms of learning new techniques or developing CAD skills for certain projects. The Canadian Tire Corporation has been very lucky with most interns that came to work with them. Like in many other companies, understanding the corporate culture is a difficult transition for students. Aside from the challenges, it helps if the interns come prepared with more research on the company and the position they are applying to. “What’s your favorite meal to make?” Come ready to learn, be excited, have passion and be curious.
Discussion direction

A great thing about industrial design is that it offers knowledge and an ability to learn. Abilities that transfer well to other programs, having the basis in the fundamentals and the passion for what we do will help us. All interns make the same mistakes in CAD, which is part of the learning process. We stagger their input and introduce them to a larger group. Students come to work without an understanding of costs. Universities should maintain the design process, but should teach how cost relates to manufacturing, shipping, pricing of a product, marketing, labour, and margin.

Interview Data

Phase 1. Early Recruitment Stage (Skills and Attributes)

- Advantage of a large corporation: Sets realistic expectations of students in their abilities to partake in a design process. Student tasks are proportioned into manageable shares in a team project.
- Research skills were lacking among many students prior to applying for an internship.
- The required technical skill sets are Rhino, 3D rendering, CAD, and mass production knowledge.
- Advice to students: “Stay curious. There’s excitement in every project.”
- Most attractive attributes were the ability to think critically and explain the process. Also, students should have a passion in kitchen appliances.

Phase 2. Project Involvement and Performance Stage

- “Corporate guideline”: Comprehensive coaching for all stages in design projects. Students get broad exposure to working with a diverse team, through internal and external collaborative opportunities, such as product development and testing.
- By the end of eight months, students are interacting with internal stakeholders, factory, and buyers. There are interactions with stakeholders, an opportunity to see the process.
- One of the benefits of working with kitchen appliances is that students get to see a lot of the product testing process. The product testing is reviewed by the factory, the third-party testing lab, often 5-7 times, and the Quality Assurance team.
Phase 3. Understanding Challenges

- The pricing and manufacturability were emphasized. To be a great designer, students need to learn how to make products in real life.
- A big improvement the Canadian Tire Corporation made is locating students within the team rather than having them all in one spot. There were more conversations and questions created when interns sat with the team, rather than isolated.
- The pricing and marketing appeared the most in the interview data. This related to the manufacturability of products, which participant felt students were not aware.
- The university has a way of doing things differently from the workplace. The focus is different. Therefore, students learn to navigate different corporate culture and see why certain things are done a certain way.

Phase 4. Partnership Opportunities

- The partnerships within Canadian Tire as a corporation: there are merchandizing programs, strategic marketing, web marketing, branding team, but not externally.

4.5.2. CGM Design Inc.
President

Background
A Swedish born designer with education in architecture. He moved on to work at the Office of Ray and Charles Eames in Venice, where he developed a talent as an industrial designer. With Knoll, one of the largest furniture companies, he has worked globally as a director of design in Europe and North America. The participant engages as a frequent lecturer of design matters for clients including BMW, Teknion, Knoll in France and UK, and universities such as SCAD, UVA, and Yale. He participated on design juries for many international competitions, productions in field, and portfolio reviews.
Insight on Practica

Whether it’s a written or visual format, it shows how a person can articulate thoughts on paper, about how a project is defined, “What is the question? What is the answer? What is the project at hand?” Common errors in young designers are not understanding how a product relates to manufacturing options, processes, materials, and client approach. To be a good designer, one must have honesty.

Discussion Direction

Discussion had more emphasis on continuous learning of young designers above foundational skills. Students should take their learning materials, studying and applying at a professional level until they become more knowledgeable.

Interview Data

Phase 1. Early Recruitment Stage (Skills and Attributes)
- Take on experience you are unfamiliar with but applying what you know are good foundational rules.
- Professionalism: Respect and value the time of others, maintain good working habits.

Phase 2. Project Involvement and Performance Stage
- Students learn by observing, exploring options, and developing tactile experience to execute real projects.
- Design work has iterative nature, and it takes continuous practice.
- Design is a reflective process that is exhibited by honest expressions of the human mind

Phase 3. Understanding Challenges
- Any time you have innovation, you have risk, it may not work unless you adjust it all the way along, and it takes time to get a proper business balance; market says good value, company says good margin.
- Be self-aware and learn from mistakes. Participant felt that mistakes are part of the learning process.
• Critical thinking should be reflected in every learning process.
• “Best practices”. Young designers or students have unrealistic expectations of themselves or feel that they are going to make lots of money.

4.5.3. Dassault Systèmes
Vice President of Design Experience, Research & Innovation

Background
The participant has 30 years of experience in automotive industry as a design director with proven leadership skills. As a VP of Research and Innovation at Dassault Systèmes, the participant works with a multidisciplinary team of the Design Innovation Department.

Insight on Practica
The role of design is constantly evolving and affecting everyday decisions in people’s daily lives, just like the way the ecosystem works. “What makes you a good designer?” Apart from the knowledge of an individual, a designer’s role is to immerse oneself into the real-world experiences by developing a connection with surroundings. An internship is a great opportunity for undergraduate students to develop a sense of connection with everyday surroundings. At Dassault Systèmes, there are two interns and two apprentices every year. By having two different types of student work placement programs in this company, the skills of two student groups are balanced out.

Discussion Direction
There is a negative energy in today’s reality in some companies where interns are requested to do errands for every department. Interns should be guided with a clear objective for the tasks that require academic knowledge and skills. “Wrong design capacity is worst, worst situation ever for a future career.”
Interview Data

Phase 1. Early Recruitment Stage (Skills and Attributes)

• To be a good designer, it is important to stay curious about the surroundings and develop an analytic skill.

Phase 2. Project Involvement and Performance Stage

• School of 3D design, animation, or design schools, we provide a project across different companies, the User Experience project
• Schools need to be more aware of any negative situations with a company where interns may end up being stuck with unnecessary errands.

Phase 3. Understanding Challenges

• The interns have less exposure to real-world opportunities, especially when they are taught in the traditional way of approaching the design problems. It is not easy to predict the projects that students get involved in, the same way as the project managers do.

4.5.4. Design 1st
VP Industrial Design

Background
The participant is Carleton University’s Bachelor of Industrial Design graduate. He has worked in a design consultancy for 25 years.

Insight on Practica
Common challenge with students is understanding client expectations in the assigned tasks such as showing how students arrived at a solution based on a client budget. When applying for jobs, students seem to have a different focus of skills as opposed to articulating ideas in a thought process. “How did you get there? What areas did you explore to get to resolution?”
Fundamentally, effective communication is a work in progress for everyone. The participant advises each student to “stay passionate and be critical.”

Discussion Direction
Design 1st is all about community. In the past, Design 1st supported design related activities and events including the Maker Fair and Code My Robot. Design 1st is always open to opportunities to help the local community, “We want to give back to the community as much as we can”. They have helped organize events with local organizations First Robotics and Random Acts of Kindness.

Interview Data
Phase 1. Early Recruitment Stage (Skills and Attributes)
- Knowledge in basic design foundations. Students need more awareness of the skills they bring from school to solve problems at workplace. Analytical, 3D, digital sketching and communications skills are very important, as it shows how students approach problem-solving situations. “How did you get there? What areas did you explore to get there?”
- Teamwork skills are very important.

Phase 2. Project Involvement and Performance Stage
- Participant finds value of interns at the company.
- Team-based environment: Seek help from others and use the available supports.
- Interns work on a specific task and there are occasional check-ins for feedback.

Phase 3. Understanding Challenges
- Time, budget, and risks were mentioned frequently.
- All companies are for-profit. Direct relationship between client budget and how the problem was solved.

Phase 4. Partnership Opportunities
- Past partnerships included Maker Fair in the local Ottawa community before COVID-19.
4.5.5. Design 1<sup>st</sup>
VP Manufacturing

**Background**
Mechanical Engineering and Project Management.

**Insight on Practica**
In a consultancy like Design 1<sup>st</sup>, project timing varies for employees depending on what project they work on. With a range of 50 to 75 projects happening in a year, junior designers or interns are assigned in the specific projects that are not directly billable to a client. A lot of projects are happening in a short amount of time, so it’s a great opportunity for students to see different types of projects. Most frequent challenge seen in past students is the “ability to generate options, sketching ideas to convey at manufacturing level”.

**Discussion Direction**
Design 1<sup>st</sup> partners with local schools like Carleton University’s School of Industrial Design. Other partnerships included high school mentorships for First Robotics and sponsoring youth education through the Maker Fair.

**Interview Data**
Phase 1. Early Recruitment Stage (Skills and Attributes)
- Participant looks for curiosity in interns when looking at portfolios. Passion and eagerness to learn were other top attributes.
- Participant looks for cross skills: Be knowledgeable in other areas and well rounded.
- Due to COVID-19, there aren’t many interns at Design 1<sup>st</sup>, but hired co-ops in the past.
- “Billable, hit the ground running”. The participant looks for 3-5 years of experience for entry positions for full-time and values for fresh ideas in junior positions. Years of experience doesn’t mean have 3-5 years as an undergraduate, means they hire senior designers.
Phase 2. Project Involvement and Performance Stage
- Students get involved in the front end of the production.

Phase 3. Understanding Challenges
- Time and budget are the main constraints in a business.
- Students take long time to learn. For that reason, the company hires more co-ops than interns.
- Not all questions are applicable to the projects. Have process in mind, know where mistakes can be made, and where challenge areas are. Ask questions within that context.

Phase 4. Partnership Opportunities
- Mostly with Carleton’s School of Industrial Design and various industrial design schools.
- Mentorship for high school level, First Robotics Engineering projects.
- Maker Fair, sponsored youth education.

4.5.6. DW Product Development Inc.
Owner, Partner

Background
The participant has 40 years of work experience in an industrial design consultancy. He participated in design critiques at Carleton, worked with 3rd and 4th year students while teaching for five years at Carleton. His company has hired from the university and elsewhere. Previously, there were two to three or four interns from Carleton that were about 99% of the interns. The participant supports the local community by contributing 15 years to the Carleton School of Industrial Design Alumni Association. Currently, the participant sits on the Advisory Board at Algonquin College, Graphic Design, and Interior Design.

Insight on Practica
In his time at DW, most interns had been from Carleton University. Most common challenges in students were lack of questions about project expectations and communication in the work placement.
Discussion Direction

Students come with great portfolio presentations and foundational skills. If students learn certain skills at school, they should continue to work with the tool until competent. Software classes at Carleton? All have formal CAD training at Carleton, 3rd year expected to be working with tool and be confident with that tool. 12 weeks only. Students should be working independently, honing their skills with their tool. Look for growth.

Interview Data

Phase 1. Early Recruitment Stage (Skills and Attributes)

- Most repeated verbs were “communicate, understand, reflect, ask questions, and explain with critical thinking”.
- Technical CAD skills and communication skills were very important.

Phase 2. Project Involvement and Performance Stage

- Students are not able to relate their time to the project cost. “How long does it take to build this in CAD?”

Phase 3. Understanding Challenges

- Challenge is how to communicate what the expectations are of the graduates in the workforce.
- Manufacturing cost, product cost, tooling cost, maintenance, retail cost, cradle story, before designing. Cost was mentioned a lot in the interview.
- Shortness of internship: 4 months.
- There are new approaches, constant learning, new software, and new concepts to learn. Students cannot be taught everything, as design process changes.
- Students are not familiar with giving a context to tasks: Quality, cost, timing, and consideration of the risks (tooling, materials, ergonomics, functionality).

Phase 4. Partnership Opportunities

- Outreach to other universities, Clemson University in USA.
• Participates in yearly alumni nights at Carleton, professional nights, speaking at grad show, critiques at Carleton and seminars.

4.5.7. Gibson Product Design (Momentum)
Owner, Partner

Background
The owner of the Gibson Product Design is a former graduate of the Bachelor of Industrial Design program at Carleton University. Along with two other co-owners of the company, who also come from Carleton School of Industrial Design (SID) program, the participant has been actively involved with SID throughout his career at Gibson. His involvement in Portfolio Review Sessions by CUSA, a keynote speech on Alumni Night, and the Grad Show has provided insights to many undergraduate industrial design students. In the past, the participant has taught the professional practice course for three years at Carleton University which also allowed him to find talents in students for internship opportunities.

Insight on Practica
Gibson Product Design is an Ottawa-based firm that supports the local design community. They are open to hiring internationally, however, they have a limited budget for internship sponsorship. While being an instructor at SID, participant and his co-owners provided industry feedback during studio sessions and 3D modeling class. Teaching a class enabled the owners of Gibson Product Design to seek strengths and observe different skillsets in students. The participant has taught 15-20 students on average, talking about the company projects and the design process and making connections to the skills they possessed. “How relevant is their study to company projects, as opposed to schoolwork?”

Discussion Direction
If students show an ability, students are encouraged to be involved in the tasks they show confidence in. If some students stand out technically or very visually, they are invited to
potential client meetings or manufacturing processes to allow students to develop skills based on their abilities. “Be eager, show passion, hardworking, and keen”.

Interview Data

Phase 1. Early Recruitment Stage

• Specific questions are asked during portfolio reviews, such as distinguishing between group projects and individual projects.
• Ability to communicate the design process was important to show in a portfolio.
• Look for technical skills in 3D modeling, foam models, sketches, 3D printing, and rendering.

Phase 2. Project Involvement and Performance Stage

• The participant sees value of having students, welcoming fresh and naïve questions that can be creative. Open dialogue for conversations with students allowed them to be creative in their thinking. The participant believes that there is value in internship as students leave the workplace with real experience. Use of the word “reciprocated” explains that both company and student benefit from this experience.
• Students were regarded as a potential team member after the internship experience.

Phase 3. Understanding Challenges

• Understanding client expectations: The naïve questions often lead to creative design options for clients as they have different focus.
• “Billable”: Budget and costs were associated with certain tasks. Students do not anticipate that in advance, but it’s a skill that they can carry back to fourth year school projects.
• Understanding the workflow and language in the workplace was challenging for students (i.e., Multibody Base Part modeling in Solidworks).
• Mistakes are not student related. Students have limited experience and they are not involved in executing products.

Phase 4. Partnership Opportunities

• Supports more local partnerships and alumni networks at Carleton University’s CIDSA.
4.5.8. Metaphase Design Group Inc.

PhD, Founder and CEO

Background
The participant holds a Bachelor of Industrial Design from Carleton University, with a minor in Architecture. He assists the University of Kansas as an advisor for curriculum for Industrial Design, with a specialization in ergonomics, medical, and other disciplines. The participant stayed in touch with his alumni networks at Carleton University, as well as University of Illinois where he has completed his PhD. He offers consultations and insights to the program at University of Illinois. In his career, the participant had 117 patents on the products he designed for a wide array of companies.

Insight on Practica
The participant hires a range of one to three interns every summer. The challenge in recruitment is finding designers who have strong research skills or an ergonomic background. At the early stage of recruitment, it is not difficult to distinguish those who rise to the top easily by getting their responses to questions about their portfolio work. Metaphase invests more time and effort on interns and staffs who are not full-time employees. Working collaboratively means play well with others, nothing unique in design.

Discussion Direction
At Metaphase, there are approximately 25-30 projects happening all at the same time, all in different phases. There are research phases, human factors phases, concept phases, ergonomic phases, and design documentation phases. Students should participate in events such as human factors conferences or IDSA’s medical conferences, which the participant had been to twice. Conferences are great learning opportunities to learn and network with experts from a similar field.
Interview Data

Phase 1. Early Recruitment Stage (Skills and Attributes)

- Multitasking skills, technical skills (Solidworks), understanding economics behind the design process, understanding budget for projects were considered important attributes.
- Communications skills were highlighted. The ability to communicate in written, verbal, and visual form were crucial (CAD, Adobe Suite, Illustrator, Photoshop, InDesign, Microsoft Suites).

Phase 2. Project Involvement and Performance Stage

- “Eat the elephant bite by bite”. The participant explained that interns have clear expectations during internship in terms of specific tasks they can manage.
- Students are positioned within the department as part of a team. They take more time to learn than regular employees, so they are supervised appropriately.

Phase 3. Understanding Challenges

- ‘Intellectual property’ came up in discussions. Students have more freedom to explore ideas, whereas real projects have many constraints with client budgets and timelines.
- Internship length: The participant felt that longer practicum would help the students integrate into the team and help transition into full-time employment upon graduation. The past practicum included 4–6-month engagement.
- There are different expectations in the academic learning and business learning environments.

Phase 4. Partnership Opportunities

- Past senior studio project with Gillette, who owned Paper Mate at the time.
- University partnerships with Carleton University, University of Kansas, Pratt University, and University of Illinois allow for internship opportunities.
4.5.9. Shopify
Former UX Manager, Shopify Fulfillment Network

Background
Around eight to nine years ago, the participant worked on Master of Design at Carleton University under the direction of Dr. Garvey. During his time at Shopify, the participant has hired three interns.

Insight on Practica
The hiring process at Shopify is fulfilled by hiring managers. The company doesn’t individually hire interns in the department. Shopify hires interns as a cluster, typically ten design interns per summer from a shortlist. There is a pool of interns, which are allocated from pool based on skill sets and project needs. Understanding the team dynamic was emphasized in the interview. Shopify tends to hire more experienced interns whereas the risks can be minimized when handling merchants. Nonetheless, Shopify has supports for less experienced interns.

Discussion Direction
Work will change a bit in the future, can go entirely remote depending on the opportunities around the world. With digital future in mind, plans are constantly evolving by hiring managers that hire interns. Best advice for undergraduate students is to find your own uniqueness to show in a portfolio and create that “past experience”.

Interview Data
Phase 1. Early Recruitment Stage (Skills and Attributes)
- Strong ability to demonstrate the thinking process was an important skill to show in a portfolio. Showing a breadth of skills (communication, research, and methodology) and having confidence were important attributes.
- Portfolios overlap between students with same school projects.
- “Hit the ground running”: Be eager, motivated, and a self-starter.
- Hiring decisions are made through hiring managers of internship program. The participant is not directly involved in the hiring decision process.
Phase 2. Project Involvement and Performance Stage

- Check-ins with students for progress, setting goals, and use of company standardized template for feedback on their tasks.
- Work involves research knowledge, work through problems, understand features and functions in projects. Technical skills.

Phase 3. Understanding Challenges

- “Perception of permission” was addressed. Participant felt that students seemed more cautious when doing tasks. This relates to lack of confidence in students and minor technical issues with projects. Supporting and coaching were available to resolve task-related issues.
- Not too many challenges were found during internship. Shopify seemed to have structured assignments for interns, giving feedback about tasks through design reviews.
- Due to COVID-19, form of work placement could transfer to remote work in future.
- Students lack the understanding of users and ability to sell products. Suggestions included exploring more textbooks on design and creating experiences of their own.

Phase 4. Partnership Opportunities

- Brain Station, user experience bootcamp in Toronto, eight weeks in intensive program.
- Internship partnerships with Carleton University and Algonquin College (4–8-month internships were typical).
- Most relationships are based in Ottawa.
- Participant gives talks to schools or teaches courses.

4.5.10. Starfish Medical
Manager

Background
The participant has been with the company for about 13 years. He started his career in 2008 as a mid-level Industrial Designer, gradually moved to a manager. Starfish has one office in Victoria
and another in Toronto. The company has a different approach than classical industrial design where it tends to be a team of Industrial Designers. At Starfish, there are three main specialities: Industrial Design, Human Factors, and UX (digital user experience). “Main challenge we face as medical designers is the regulatory burden which is significant in the industry.” However, there are lifelong learning opportunities at Starfish, projects that incorporate usability approach in the design of machines, such as the Ultrasound machine that serves all kinds of different measuring applications for medical needs.

Insight on Practica
Starfish had consistent interns from 2014 until the company decided to take a break in 2018. After the COVID-19, Starfish hired a co-op student for the first time since 2018. For interns to succeed as good designers in this company, students need the capabilities to illustrate ideas effectively through a digital application, as well as on paper. In the medical field, an aesthetic quality is less important than the user-oriented design ideas that need to be communicated. “How did you get to this conclusion? Did you do this testing?” Having a good understanding of anthropometrics, ergonomics, and materials knowledge is beneficial to the design position. According to the participant, Carleton’s industrial design students come away with a high level of materials knowledge and applications to design.

Discussion Direction
The participant recommends that Carleton start exploring the Algorithm Aided Design approach for student learning, doing brainstorming amongst different disciplines with specific ideas. Starfish has different phases, with a lot of oversights and risks involved in each phase. “What are the risks of a design?” One unique to medical industry is the great importance of risk analysis, “Can those risks be mitigated by designing them out, or be mitigated by training or something?” A lot of testing happens at Starfish, such as usability testing, standardized testing, and Failure Mode Effects Analysis. Insights included, “How to do risk analysis in product development? What happens in a regulated environment?”
Interview Data

Phase 1. Early Recruitment Stage (Skills and Attributes)

- Technical skills and communication skills are highlighted throughout the interview. Knowing the computer software is considered an asset for working in medical design such as 3D printing, and control design files using PDM works. CAD is mentioned multiple times in the participant responses, as it becomes a tool to explain ideas for parametric drawings, rendering, mock-ups, user research, prototype, FIGMA, Rhino, Adobe InDesign, Photoshop, Illustrator, and PDF.
- The breadths of idea in portfolio determines how well students do at different tasks.

Phase 2. Project Involvement and Performance Stage

- There was a frequent mention of the iterative design process which involves reflective thinking and interaction with computer tools in the workplace.

Phase 3. Understanding Challenges

- The nature of work in medical design needs to be accurate. Previous experience in design control is preferred, but not mandatory.
- There was a frequent mention of the word, “oversights”. The participant felt that doing a medical design requires a lot of knowledge and expertise as there are a lot of risks to be anticipated in the medical design process.

Phase 4. Partnership Opportunities

- The company had internships with University of Victoria and OCAD in the past.
- Try to do things with Carleton more collaboratively, we have a presence in Ontario, work at Toronto office in human factors.
4.5.11. Tupperware Brands Corporation
Former Vice President, Research & Innovation (Global Research and Development)

Background
In addition to an active involvement with WDO, he is one of global leaders in product design, engineering, innovation, and product management. He obtained a BFA in Industrial Design at Carnegie-Mellon University, a BSc in Mechanical Engineering at University of Pittsburgh, an MSc in Management at Purdue University, an MBA in International Business at Tilburg University in Netherlands and holds a PhD from Cranfield University in the United Kingdom.

Insight on Practica
Internships are usually short terms between three to four months and students are given specific assignments under a design manager’s guidance. The role of the design managers is to drive that process with interns. Benefits of having co-op or intern students are the values that they bring into the company. They bring in fresh ideas and energy to the team. Because it is a competitive field for internship opportunities, the challenge with schools is that they want broader opportunities for students in a short period of time. At Tupperware, it is a tightly supervised environment for interns and co-ops, where they would be placed in a supporting role in product engineering or research and development. Expectations in the academic environment and corporations are very different, so it is very challenging for a designer to work in a corporation to develop visual aspects, understand sales, and brand value.

Discussion Direction
The participant is not directly involved with hiring interns or working with interns, as students are assigned to specific design managers. He describes that value of having student interns or co-op is the energy and passion they bring to the team. Put together a strong portfolio, very visual, important to understand the technology or mechanics behind it, “What’s your contribution to this solution you are presenting?”
Interview Data

Phase 1. Early Recruitment Stage (Skills and Attributes)
• The use of metaphor “ivory tower” in the participant response, describes the importance of having the technical skills to interpret design problems in brainstorming stage.
• Passion was repeated in the interview. The participant felt that passion is a natural quality that varies from a student to student.
• Communication skill is highlighted in the interview. It is defined as a meaningful conversation in design, being able to articulate ideas clearly through design thinking process in reference to IDEO’s Double Diamond (Discover, Define, Develop, and Deliver).
• Tupperware values breadth of experience during internship, which is one of the ways to determine future employment.

Phase 2. Project Involvement and Performance Stage
• Student interns work with design managers or senior designers. Students are always interacting with the design team, in a collaborative setting. Giving feedback to students in this collaborative setting seemed to encourage learning opportunity with experts.
• Participant believes that having strong relationship with design managers allowed student interns to feel connected during their tasks.

Phase 3. Understanding Challenges
• Participant believes in no risks during internship because students are assigned to specific roles, preliminary design roles to support the design process.
• Since participant is involved in product development and research, it seemed that creativity was an important quality to look for in student interns to increase Tupperware’s brand value.
• Gap between academics and corporations is the problem-solving approach. Academics tend to raise more questions than presenting an answer. Participant insight can be interpreted that having answers is related to everyday product decisions or solutions for clients, which cannot end in questions.
Phase 4. Partnership Opportunities

- “Partnerships with mostly PhD or master’s level on collaborative research projects, but not a lot with undergraduate level”. It appears that undergraduate students are less involved in research internship, depending on project needs.
- There are international projects with India, San Francisco, Ohio State, Purdue, and CCA.

4.5.12. Umbra
President

Background
The president of Umbra comes from a music and business background. As a founder of Trans Canada Hardware (TCH) and Umbra, his views on success are knowing the marketplace, learning from failures, and being passionate about the work.

Insight on Practica
“Interns that get hired bring in fresh ideas, have the ability to collaborate, and are fast learners. Interns succeed in being hired for a number of reasons: Look for imagination, creative spark, and personality, communication skills, their vision, other experiences, not too narrow, the attitude.”

Discussion Direction
“Great design is 5-10 percent of success”. This is a quote by the president of Umbra that highlighted the interview. The participant added that there is a small number of successes in the marketplace where the focus is on learning from failures, which applies to the remaining 90-95 percent. One way to discover a talent is through design competitions in the marketplace like telling a story to find future talents. Unlike some companies that don’t have their own design departments, Umbra is much more advanced in its capabilities. Even if certain projects don’t work out as planned, Umbra has a resilience to respond to the evolving needs of the marketplace.
Interview Data

Phase 1. Early Recruitment Stage (Skills and Attributes)

- When hiring interns at Umbra, the company takes a holistic approach to discover a variety of talents that are suitable for the efficient business operation. The participant believed in flexibility when it came to filling multiple positions in the company rather than hiring exclusively design talents. “Can still use them”.
- Talents are discovered through international design competitions or graduate exhibitions. Awards are given to promote creativity among students, not necessarily to gain business ideas for profit. Having technical computer skills and communication skills were very important.
- “Emotional connection to design. Passion for design. Empathy for design.”
- The word 'confidence’ was mentioned less in the interview data than other attributes. It seemed that Umbra was open to accept different strengths in students and invest in talent development through appropriate guidance.

Phase 2. Project Involvement and Performance Stage

- Participant’s perception of collaborative work and technique translate easily from his music practice. “Unless you’re a soloist”. This phrase signifies the value of teamwork and the need to communicate well with other employees in the company.
- Students are closely supervised and guided by senior designers. Frequency of project feedback and casual conversations indicate that Umbra is an inclusive environment for their interns.

Phase 3. Understanding Challenges

- There were advantages and disadvantages to project timing and the internship length for training. In a fast-paced work environment, interns see projects moving fast which means they get involved in a variety of tasks from sketching to CAD work, or sanding foam models in the prototyping process. On the contrary, shorter internship length meant less opportunity for interns to see “end results of their own projects”.

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• Understanding of the marketplace and practicality were mentioned the most during the interview. This type of experience can be useful by seeing how similar products are sold in the market. “What’s successful in the market? What’s not successful in the market? Study what works and why it works in the market.”

• Understanding the company culture was part of challenges students experienced during internship. Culture referred to type of clients, company vision, and the “niche” Umbra operates in: Affordability, modern aesthetic, good function, and attitude of casual design.

Phase 4. Partnership Opportunities

• Collaboration with Pratt Institute, Rhode Island School of Design, Savannah College of Art and Design, competitions in California, international design competitions in Japan and Korea.

• Competition with Humber College and OCAD University.

• Supports design community by offering internship opportunities to students.

4.5.13. Umbra
Co-Founder (retired)

Background
Prior to joining Umbra as a Co-Founder in 1979, the participant received education in Graphic Design at George Brown College in 1974. His flair in design and technology derived from an early age while working on projects at his father’s hardware store, which led him to pursue his career interest in graphic design. During his professional career at the world’s first digital typography company in Ottawa, the participant encountered frustrations with window treatment options for his new home. Later, the need for designing window treatments inspired the birth of Umbra along with his childhood friend and eventual president of Umbra. As the company evolved, the participant’s focus in business recruitment transitioned into knowledge sharing by speaking at universities and developing creative design projects through retail partnerships with companies such as Target.
Insight on Practica

Having spent 25-30 years of working with undergraduate students, the participant feels that students need to invest more time to research a company and develop their portfolios accordingly. Prior work experience is recommended, which can be through volunteer work or tangible work experience. Students are generally not prepared to work in a competitive work placement unless they develop a strong understanding of marketplace, company culture, value, and mission.

Discussion Direction

“Teachings are out of date and project management is not taught in schools. The serious gap is that it takes a long time for schools to plan and implement courses.” Towards the end of the research interview, the participant emphasized the importance of industry training that should be updated more frequently to prepare students to the industry level. The participant also suggested that companies start investing in more training for future graduates.

Interview Data

Phase 1. Early Recruitment Stage (Skills and Attributes)

- Passion, creativity, good communication skills, and technical computer skills were the top attributes for interns at Umbra. Communication skills included effective writing skills for documentation and using appropriate language for composing e-mails.
- Speaking with the senior design team at Umbra helped to identify the importance of Solidworks knowledge to present concept development, prototype, or product rendering.
- Possessing a positive attitude and mindset were mentioned by the senior design team. It seemed that students who succeed are the ones who are willing to learn the company culture and contribute their time.

Phase 2. Project Involvement and Performance Stage

- Umbra offers casual meetings and feedbacks to interns. Socializing was mentioned by senior design team, which can be interpreted as the value of collaborative work. Students seem to be included just as any team members at Umbra.
• Openness in the interview response can be an indication that students are connected to their design team emotionally and intellectually. This could motivate students to produce better results in their tasks.
• Mention of different roles in the company such as “creative director, senior designer, intermediate designer, junior designer, sales manager” imply that students get exposure to various departments and learn new skills by interacting with many people in the company.

Phase 3. Understanding Challenges
• Student mistakes are anticipated during internship. Senior design team usually catches student mistakes before manufacturing. It was reported that having a low expectation in students surprised with best results. This shows that senior design team believed in student success by providing appropriate coaching.
• Naivety in students was addressed. Failure and rejection seemed to be the biggest fears in students during design reviews. Students should realize that design process should be “evidence-based”. They should spend more time on researching how a product will be sold, manufactured, and presented to the market. Naivety can often drive youthfulness to the company and bring fresh ideas to market, which can be regarded as opportunities for the company.

Phase 4. Partnership Opportunities
• Partnerships with software developers; use of technical computer tools such as Solidworks was highlighted during the participant interview. It is an important computer tool that is associated with manufacturing of products.
• Partnerships with universities; Umbra is open for supporting student competitions to find new talents and fresh approach to design problems.
CHAPTER 5. DISCUSSION AND CONCLUSION

5.1. Intersecting Themes with the Existing Research

As an overview of the research in this chapter, it is important to review the findings from the existing research to identify the intersecting themes. In the existing research, the role of practica was investigated in different research disciplines such as graphic design, engineering, and business. The frequent mention of the internships in the existing research was an indication that different research disciplines also valued practica as a connection between the academia and real-world experiences for undergraduate students. The findings in this research identified the similarities and differences with the existing research.

The following were the similarities between the existing research and this research.

• The methods of data collection such as semi-structured interview method was incorporated to gather insights from participants.
• The existing research mentioned the transfer of knowledge or skills in an internship.
• The length of the practicum periods in the existing research were reported to be 3-4 months or 12 weeks.
• The research target group was the students in the 3rd and 4th years.
• The practicum programs were completed by submitting journals or written reports after students reflected on the company tasks.

There were the differences that identified the following gaps in the existing research.

• The quantifiable data in the existing research tends to be very descriptive about the measure of student successes and performances. For example, one survey result described the student skills by giving a scale of 1-4 instead of explaining how the skills improved.
• The research on industrial design practices and funded projects appeared more in graduate studies. Additionally, the funding did not seem to be prioritized for undergraduate practicum programs.
• Internships were usually offered to senior undergraduate students in this research, not for the 1st and 2nd year students.
The following themes defined the success factors of the industrial design practica as the knowledge transferred from an academic environment to a company environment.

Theme 1: The Length of the Practicum Period
According to interview responses in this research, internships usually lasted 3-4 months in most companies. In one of the Company Expert Interviews, the longest internship period was 6 months at Tupperware. Also, few participants mentioned that the time it takes students to learn was related to the time they spent at a job. In a design consultancy firm like Design 1st, the company hired more co-op students than interns due to the shortness of the internship period. Another company that benefited from a longer internship period was Shopify, which had internship partnerships with Carleton and Algonquin in the past, from a minimum length of 4-8 months. Similarly, the CEO of Metaphase Design Group Inc. indicated a successful example of past internship lengths of 4-6 months. Moreover, the director of Carleton University has noted that a longer internship period would allow the work to transition to the next employee more effectively at the end of the internship period. Even though the length of the internship period varied between companies in this research, all company experts appreciated the value of internships and believed in supporting the local design communities.

Theme 2: The Role of Mentors in Academia and Companies
The academic experts in this research were identified as the practicum advisors. After discovering the similarities between the existing research and findings from the research interviews, there were very interesting responses from the practicum advisors. The practicum advisors from Carleton University, Emily Carr University, Humber College, OCAD University, and University of Alberta all had multiple roles. The participants either belonged to a career office in the school who supported all departments or taught a design practicum course as an associate professor in the industrial design program. According to the interview data, there was no specific practicum advisor assigned to the industrial design department in each school. Therefore, the participants addressed the need for a specific mentor or a liaison person for practicum opportunities. The practicum advisors from Carleton University and Humber College emphasized the importance for a mentor or a supervisor in the companies who can provide more clear objectives for student tasks.
Theme 3: Fundings to Support a Practicum Program
Most practicum advisors in this research interview had addressed the need for funding and creating research partnerships with the federal government for undergraduate students. The practicum advisors who suggested the government funding into the practicum programs were Carleton University, Humber College, and OCAD University. Also, the importance of government supports was also mentioned by the company experts like the co-founder of Umbra.

Theme 4: Reflective Thinking Process
As mentioned by many company experts during the research interview, design projects have an iterative nature that requires students to reflect on performed tasks. Interns bring in unique attributes in their learning process while applying knowledge to assigned tasks. Kolb’s experiential learning model explains the parallel relationship between an iterative design process and the individual learning process that are cyclical. University of Alberta and Carleton University had similar responses in student success during the practicum experience.

Theme 5: Effective Interactions in a Company Environment
At the Canadian Tire Corporation, two different types of interactions were addressed during the co-op placement experience. When students were working in an isolated desk area with other interns, there was a lack of dialogue between work supervisor and students. After placing students within the team, students increased productivity during assigned tasks.

Unlike larger companies addressed in this research, like Canadian Tire, Dassault Systèmes, Shopify, and Tupperware, there were companies that had varying interactions with undergraduate students in the following circumstances: 1. In a smaller company whose President or CEO lectures at universities. 2. The interaction with undergraduate students is at a group level, not an individualized experience.

The following were the examples of the challenges during a practical learning at an internship.

Challenge 1: Students had limited responsibilities in companies that were strongly connected with manufacturing activities. According to the practicum advisors in this research, many
students engaged in design practica without the knowledge of manufacturability or marketability of products they design.

Challenge 2: In consultancy companies like Metaphase Design Group Inc., Design 1st, DW Product Development Inc., and Gibson Product Design (Momentum) that serve multiple businesses and clients at various project stages, tasks have strict timelines. In these types of fast-paced environments, students were expected to be involved in sketching, concept development, prototyping, and presentations with clients in a design review. Therefore, developing employable skills was regarded as a future consideration for full-time employment and developing a talent.

Challenge 3: Many company experts have addressed the challenges of having shorter internship periods of 4 months. In this research, students often exited the company without seeing the end of the project phase, which were the opportunities students often miss at the end of the internship.

Challenge 4: Another challenging factor in students were psychological factors such as a lack of confidence or motivation due to unrealistic expectations of workplace tasks. The practicum advisors of OCAD University, Humber College, and Carleton University noticed this common trait in many undergraduate students in the early stage of the internship.

Challenge 5: Transitioning from an in-class environment to a company environment
Company culture and project focus are different from the classroom environment. Students felt that they had the ownership

Challenge 6: Students have unrealistic expectations in the work placement environment, as school is a more nurturing environment. Appropriate mentorship and conversations would encourage students to feel engaged emotionally with their tasks.

Challenge 7: There were a small number of practicum enrolments in this research. Some industrial design students were not fully aware of the value of doing internships. There was a
lack of internship opportunities for undergraduate students as the enrollment numbers were very low in these practicum programs.

The following are the suggestions from the company experts to overcome the challenges.

- The practicum advisors can include more information sessions about the mentorship programs for the internship preparation.
- More companies can offer more internship opportunities to undergraduate students to increase the awareness of the internships.
- The company experts can assign a specific supervisor or a mentor within the team and clearly explain the student’s tasks in the beginning of the internship.

5.2. Conclusion

The research interview questions were organized into four phases based on different stages of the practicum process in two types of learning environments. The initial learning stage before a practicum placement was an in-class environment where preliminary knowledge and skills were acquired during class projects. The next learning stage was the company environment where the knowledge and skills were transferred to real tasks.

While examining the types of assigned tasks and skills learned from the transition between the two learning environments, the following themes were discovered through the interviews with both academic and company experts: investigating key roles of a supervisor and a mentor, the degree of interactions within assigned departments, quality of mentorship, the need for funding sources, industry relations with participating schools.

The interview of industry experts has allowed the researcher to access meaningful insights from their day-to-day interactions with students while specific tasks were carried out between an in-class setting and work placement environment. The research gap was not necessarily about the skills students lacked during the completion of certain tasks. The gap rather existed in the company environments where the students had to learn different types of job requirements.
The research interview was an opportunity for academic experts to rethink the practicum programs for student learning and discover new ways of finding supports such as the need for government funding. Therefore, the growth of the practicum program will result in higher achievement of undergraduate students, benefiting the schools, companies, and the economy. The data extracted from the interview suggest areas for practicum development that could expand to other disciplines such as the increase in enrolment numbers and seek other collaborative opportunities with local or global organizations.

COVID-19 has brought many new adjustments to contemporary lifestyles, including the way people work, communicate, or consume products. Effects of COVID-19 either restricted or promoted businesses to an extent. Some of these businesses are partnered with school programs that hire interns or co-op students who are in their final years before graduating. Although many participants in this research interview were affected by COVID-19 in their work environment, each participant was open and encouraging towards giving constructive insights to assist future learning for undergraduate students. This research was an opportunity to discover that industrial design communities are very supportive.

5.3. Limitations of the Study
Prior to the ethics approval, there were some challenges during the research process.
- The most difficult challenges were finding the right contact for the practicum advisors in some schools.
- During the recruitment, there were changes in the research participant types.
- Some participants transitioned to new jobs or changed positions in the company while the interviews were being analyzed.
- There was confusion while navigating some school websites and some school program information was not fully current at various stages in the research.
- As a result of the evolving restrictions due to the COVID-19 virus, there were reduced internship opportunities in some companies.
5.4. Contributions to the Field

- Interviewing experts from industrial design companies and academic institutions has provided professional insights into the development of current and future practica.

- This research will add new dimensions for future research directions and educational initiatives, or policies set by specific industrial design schools in Canada and abroad.

- The research insights can contribute to the development of internship opportunities in companies by offering mentorship programs or formal training opportunities as emphasized in the existing literature.

- The research interview questions can also contribute to forming interesting discussions among the professors and the practicum advisors who can work collaboratively.

- The data from this research will become useful resources for sharing amongst all designers and educators in their related disciplines.

- The challenges mentioned by each expert in the work placement environment suggested new opportunities for improving current internship programs in companies.
REFERENCES


APPENDIX A. Informed Consent Form

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Date of Clearance: April 6th, 2021

Invitation
You are invited to take part in a research project that asks to share your expert insights on the work placement opportunities offered to the undergraduate industrial design students. Your expert insights will provide a valuable feedback for prospective students who are preparing for the first career. The information in this form is intended to help you understand what we are asking of you so that you can decide whether you agree to participate in this study. Your participation in this study is voluntary, and a decision not to participate will not be used against you in any way. As you read this form, and decide whether to participate, please ask all the questions you might have, take whatever time you need, and consult with others as you wish.

What is the purpose of the study?
The purpose of the research project is to implement the industry expert insights into the Canadian undergraduate industrial design practica, in order for students to be best prepared for the first career. Part of the research goal is to identify some of the challenges that both students and experts may experience during each stage of the work placement process. Obtaining expert insights on the industrial design practica would allow future practicum advisors to implement best strategies for developing an effective and constructive work placement program for student learning. Other research goal includes the investigation of corporate partnership with the industrial design schools that would offer other valuable learning opportunities, such as the keynote lectures at school. One of the key benefits of this research is that practicum advisors would be able to assist students more effectively to develop specific skills that
APPENDIX B. E-mail Invitation

Email Invitation

Subject: Invitation to participate in a research project on the assessment of Canadian Undergraduate Industrial Design Practica through a corporate perspective.

Wednesday, April 7th, 2021

Hello,

My name is Anna Kabjin Kim. I am a Master of Design student in the Faculty of Engineering and Design at Carleton University. I am working on a research project under the supervision of Professor Thomas Garvey.

I am writing to you today to invite you to participate in a study entitled, "Industry Insights: Assessing Canadian Undergraduate Industrial Design Practica through a Corporate Lens". This study aims to investigate ways to improve the undergraduate student work placement experience. By implementing expert insights into industrial design practica, students can be guided more strategically to prepare for real-world opportunities.

This study involves semi-structured interview, one 40-to-60-minute interview that will take place on Zoom application. With your consent, interviews will be audio-recorded or video-recorded depending on your preference. If you prefer audio-recording, you will be able to turn off the camera setting on the Zoom screen before we proceed with the recording. Once the recording has been transcribed and verified, the audio or videorecording will be destroyed by removing from my personal computer where the original data is locally saved. If you wish to be included in the decision making of the destroying process, you may advise how it should be done.

While this project does involve some professional and emotional risks, care will be taken to protect your identity. This will be done by keeping all responses anonymous and allowing you to request that certain responses not be included in the final project. Any personal names will be anonymized by assigning a code. However, the title of your profession (i.e., professor, practicum advisor or general manager, etc.) will be shared to validate your level of expertise as an expert.
You will have the right to end your participation in the study at any time, for any reason, up until April 23rd, 2021. If you choose to withdraw, all the information you have provided will be destroyed from my personal computer within 90 days of the withdrawal.

All research data, including audio or video-recordings and any notes, etc., will be stored in a personal computer, password-protected. The personal computer will only be re-opened by my fingerprint or by entering the personal password. Any hard copies of data including any handwritten notes will be kept in a locked room in my residence. Research data will only be accessible by the lead researcher and shared to the thesis supervisor. All data will be destroyed after completion of the thesis research.

In closing, there will be no compensation for taking part in the interview. However, you may request me to share research findings to help benefit your research interests in work placement programs.

This research has been cleared by Carleton University Research Ethics Board-B (CUREB-B Clearance # 115467).

Should you have any ethical concerns with the study, please contact the REB Chair, Carleton University Research Ethics Board-B (by email: ethics@carleton.ca). For all other questions about the study, please contact the lead researcher.

If you would like to participate in this research project, or have any questions about the research, please contact me at annakim4@cmail.carleton.ca.

Sincerely,

Anna Kabjin Kim

Master of Design Student

School of Industrial Design
Carleton University, Ottawa
annakim4@cmail.carleton.ca
APPENDIX C. Practicum Advisor Interview Questions

In the following 40-to-60 minutes semi-structured interview questions, you will be asked to answer 10-15 questions that relate to student practicum experience in your undergraduate industrial design program. The following questions are organized into four themes such as preparation for work placement, available support, understanding challenges and partnership opportunities. As an academic expert of practicum advising, you will be asked to share insights on student work progress during the practicum experience and suggest the areas of learning opportunities that would help students to prepare for their next career development.

Phase 1. Preparation for Work Placement
1. Can you please give an overview of the practicum process for your industrial design program?
2. What type of efforts are made by your program to assist students to obtain desired work placement opportunities?
3. What steps do you take to encourage students to prepare for specific job requirements set by the corporate career posting?

Phase 2. Available Support
4. What skills do your industrial design students acquire from the program that they can apply to work placement?
5. What type of new skills and industry knowledge have your students acquired after the work placement experience?
6. How have your students applied new knowledge from work placement into practicum reports or final projects?
7. Were there any new learning opportunities at work placement reported by your students? (i.e., design software use, plant tour)
Phase 3. Understanding Challenges

8. What were some of the early challenges identified by students as work placement started? (i.e., misunderstandings, etc.)

9. What were some of the challenges identified by students during given projects at work placement? (i.e., learning manufacturing standards, vendor contact, etc.)

10. Can you provide an example where students in your industrial design program faced challenges in advancing certain skills required for work placement?

11. How does your industrial design program assist students to overcome these challenges with meeting project requirements?

12. Does your program wish to add or make any changes to current industrial design practicum to enhance the quality of student work placement experience?

Phase 4. Partnership opportunities

13. Has your industrial design program collaborated with corporations in the past for other hands-on opportunities for student learning?

14. Do external partners offer other hands-on opportunities or activities for students apart from the practicum? (i.e., guest speaker series, workshops, portfolio review etc.)

15. Does your industrial design program have plans to incorporate new opportunities to enhance practicum experience?

In closing, I would like to thank you for contributing your time to participate in this study. You may be contacted again for the follow-up if any of the responses require additional information or new questions may arise.
APPENDIX D. Company Interview Questions

Company Interview Questions

In the following semi-structured interview questions, the participant will be asked to answer 10 to-15 questions. The interview can take minimum of 40-to-60 mins, depending on the length of your responses. These questions are intended to obtain your expert insights to enhance work placement opportunities offered to the undergraduate industrial design students. The following questions are organized into four themes such as early recruitment stage, project involvement and performance, understanding challenges, and partnership opportunities. Based on your professional observation and interaction with students in your company, you will be asked to share insights on student skill sets and performance during various stages of work placement.

Phase 1. Early Recruitment Stage
1. Does (insert company name) hire student interns from industrial design programs?
2. What skills should undergraduate students possess that are essential to an entry level position? (i.e., aside from a great portfolio)
3. What attributes or qualities stand out the most in students?

Phase 2. Project Involvement and Performance
4. How have your previous students transitioned from entry level to experienced level, at the end of the work placement? (i.e., progress)
5. How do students apply academic skill sets for fulfilling duties in company projects? (i.e., PowerPoint skills, etc.)
6. What types of duties are assigned to students during the internship period? (i.e., early conceptual to project launch)
7. How does your corporation evaluate student work performance?
8. After hiring students, how much student contribution did the projects receive during the internship period? (i.e., 4 months internship period)
Phase 3. Understanding Challenges

9. What are some examples of common student mistakes or errors that can occur during various project phases?
10. How does (insert company name) manage student mistakes or errors in a project?
11. What factors would hinder and delay students to move forward to the next step during assigned tasks? (i.e., moving from concept to development)
12. How much supervision do students require during assigned tasks?
13. What advice do you have for students with no experience or very little exposure to the industry?

Phase 4. Partnership Opportunities

14. What types of educational partnership has your company previously supported to industrial design programs? (i.e., design workshops, keynote, design competitions, etc.)
15. Have you considered future partnerships with other industrial design programs regarding student work placement opportunities? (i.e., hands-on training)

In closing, I would like to thank you for contributing your time to participate in this study. You may be contacted again for the follow-up if any of the responses require additional information or new questions may arise.
APPENDIX E. Practicum Course Outlines; The Application Forms


Internship Insurance Forms

BID students are required to complete CO-OP or an internship to complete their degree. Please fill in this form to get access to the needed insurance forms,

Carleton Id *

Name *

First

Last

Please select one of the scenarios (below) that represents your internship so that we can direct you to the proper forms you need to fill out so that you can be covered by worker’s insurance. *

- International unpaid or paid internship
- Canadian paid internship NOT covered by workplace insurance (must be an employee not an independent contractor)
- Canadian paid internship covered by WSIB (must be an employee not an independent contractor)
- Canadian unpaid internship/mentor-ship

Submit

- School of Industrial Design
- 3470 Mackenzie
- Carleton University
- 1125 Colonel By Drive
- Ottawa, Ontario, K1S 5B6
**EMPLOYER EVALUATION**

**INDUSTRIAL DESIGN WORK PLACEMENT**

**INDUSTRIAL DESIGN STUDENT INFORMATION**

* Please note you can complete this form electronically, by clicking on a grey box to enter data in a field.

<table>
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**EMPLOYER INFORMATION**

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Dear Employer,

Thank you for participating in our Industrial Design Work Placement Internship program, and helping our student gain valuable, practical experience. Feedback from the employer is an integral part of student development, and as such, we encourage you to share your observations with the student as part of their learning.

We at Humber would also appreciate some feedback on how the student performed in your environment. Would you please take a few moments and complete the following Performance Evaluation?

You can email this evaluation directly to me, in confidence. Or, the student may scan/email or deliver this document to me c/o Work Placement Services Office.

We value your contribution, as we’re sure our students do, in this important phase of their education and we thank you for your support.
Any personal information you choose to provide on this form is protected under the Freedom of Information and Protection of Privacy Act. The information you provide will be used to update your OCAD U records. These records are only viewed by OCAD U administrative staff and not released to any other parties.

We encourage you to complete and sign this application form digitally.

### TO BE COMPLETED BY STUDENT

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Student Number</th>
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### EXPERIENTIAL LEARNING PLACEMENT PROGRAM VERIFICATION

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Average Credit Weight: 0.5
(70% min. 80 - 120 Placement Hours)

Credit Weight: 1.0
(160 - 240 Placement Hours)

Credits Earned
(10 min.)

Previous Independent Study or Field Placement credits (1.5 max.)

- [ ] Fall
- [ ] Winter
- [ ] Spring/Summer

Anticipated Placement Start Date: 

Description of Student's role within the Placement Organization (75 words max.):

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<th>Credit Weight: 0.5 (80 - 120 Placement Hours)</th>
<th>Credit Weight: 1.0 (160 - 240 Placement Hours)</th>
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### PLACEMENT PARTNER INFORMATION

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FIELD PLACEMENT APPLICATION

Any personal information you choose to provide on this form is protected under the Freedom of Information and Protection of Privacy Act. The information you provide will be used to update your OCAD U records. These records are only viewed by OCAD U administrative staff and not released to any other parties.

We encourage you to complete and sign this application form digitally.

TO BE COMPLETED BY ACADEMIC PROGRAM CHAIR
(or Associate Dean if Program Chair is serving as Faculty Supervisor)

Course Subject Area or Equivalent Course:  
Program Chair or Associate Dean - print name:

Signature:  
Date:

TO BE COMPLETED BY FACULTY SUPERVISOR

As Faculty Supervisor, I agree to meet with the Student at regular intervals throughout the duration of the Field Placement, establishing learning outcomes and deliverables, and providing guidance and critical feedback from the academic perspective.

Faculty Supervisor - print name:  Signature:  Date:

Return by email to:  Experiential Learning Placement Program Coordinator
Centre for Emerging Artists & Designers, OCAD University  Email:  @ocadu.ca  Tel: 416 977 6000

TO BE COMPLETED BY THE OFFICE OF THE REGISTRAR

Received:  Staff Initials:  Date:  Field Placement Course Code:

Permission to register granted:  Staff Initials:  Date:

www.ocadu.ca/explearning - 2018  Page 2 of 2
The Department of Art & Design encourages eligible students to pursue one 3* practicum placement during the course of their BDes program. Students should meet with the Undergraduate Advisor to confirm eligibility at least 1 month before the beginning of the practicum term as it may take time for you, your employer and your supervisor to finalize details, and for your registration to be completed.

**Please note: The Department normally does not assist students in finding a practicum placement.**

Practicum opportunities are also contingent upon the availability of our full-time continuing Faculty; as such, spring and summer practicum placements are not always possible.

**Design 586 and 587 (fall/winter)**  
**Design 537 and 538 (spring/summer)**

These are one-term practicum courses that require you to have a supervisor (a full time continuing staff member) who is in touch with the employer overseeing your work at the chosen company. Normally, in the fall/winter term, practicum students go to the workplace one day per week over a 13 week period. That means from 91 to 104 hours (plus additional homework time) depending on whether the workday is counted as 7 or 8 hours in length.

**For any practicum course**, you must be registered for the course during the same term in which you do the practicum. You must provide your supervisor (instructor or coordinator) with contact information for your employer and establish a date for the submission of a portfolio of work (electronic or print) completed. Your supervisor discusses the conditions of your employment with your employer. At the end of the period, your supervisor contacts your employer and reviews the final portfolio. Overall performance is discussed and a grade is awarded, by your supervisor, at the end of term.

February 2014
Request for Course Registration

Design Practicum

Student

student's name

U of A LG number

e-mail address

area code + telephone

I request registration in the following vcd course (number)
course

term

student's signature

year

Supervisor

supervisor's name

e-mail address

telephone

supervisor's signature

Employer

company name + contact person

e-mail address

area code + telephone

address

employer's signature

Important:
The student is responsible for submitting the completed form to the Department of Art and Design General Office at least 1 week before the University registration deadline.
## CANADIAN INDUSTRIAL DESIGN SCHOOLS

Schools currently offering Industrial Design and related courses in Canada.

### Ph.D. Programmes

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<th>Programme</th>
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<th>Years</th>
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<tr>
<td>AB</td>
<td>University of Calgary</td>
<td>Faculty of Environmental Design</td>
<td><a href="http://www.ucalgary.ca/evds/">www.ucalgary.ca/evds/</a></td>
<td>403.220.3630</td>
<td>Environmental Design</td>
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<tr>
<td>QC</td>
<td>Concordia University</td>
<td>Dept. of Mechanical &amp; Industrial Engineering</td>
<td><a href="http://www.me.concordia.ca">www.me.concordia.ca</a></td>
<td>514.846.2104 x 3125</td>
<td>Doctorate of Philosophy (Mechanical Engineering)</td>
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### Masters Programmes

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<td>Ecole de design industriel</td>
<td><a href="http://www.dix.unimontreal.ca">www.dix.unimontreal.ca</a></td>
<td>514.343.7506</td>
<td>Maîtrise d’aménagement (Francophone seulement)</td>
<td>M.Sc.A.</td>
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<tr>
<td>QC</td>
<td>Concordia University</td>
<td>Dept. of Mechanical &amp; Industrial Engineering</td>
<td><a href="http://www.me.concordia.ca">www.me.concordia.ca</a></td>
<td>514.846.2104 x 3125</td>
<td>Masters of Engineering (Mechanical Engineering)</td>
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<tr>
<td>QC</td>
<td>Concordia University</td>
<td>(Same as above)</td>
<td><a href="http://www.me.concordia.ca">www.me.concordia.ca</a></td>
<td>514.846.2104 x 3125</td>
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<td>514.846.2104 x 3125</td>
<td>Masters of Applied Science (Industrial Engineering)</td>
<td>M.A.Sc.</td>
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<tr>
<td>QC</td>
<td>Carleton University</td>
<td>OCIMME Graduate Administrator</td>
<td><a href="http://www.ocimme.ca">www.ocimme.ca</a></td>
<td>613.520.5809</td>
<td>Masters of Mechanical Engineering</td>
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### Bachelor & Diploma Programmes

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<td>1440, chemin Côte-Sainte-Catherine Montréal, QC H3C 1M8</td>
<td><a href="http://www.dix.unimontreal.ca">www.dix.unimontreal.ca</a></td>
<td>514.343.7076</td>
<td>Baccalauréat en design: orientation design industriel</td>
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### Bachelor & Diploma Programmes (continued from previous page)

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APPENDIX G. Interview Transcription Templates in Word Document

Professional Designation, School Name

Phase 1. Preparation for Work Placement

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Academic skill sets</th>
<th>Requirements</th>
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</thead>
</table>
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• Attribute 2
• Attribute 3 | • Skill 1
• Skill 2
• Skill 3 | • Requirement 1
• Requirement 2
• Requirement 3 |

Phase 2. Available Support

<table>
<thead>
<tr>
<th>Applied Skills</th>
<th>Progress</th>
<th>Responsibilities/Roles</th>
<th>Evaluation</th>
<th>Contribution</th>
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</table>
| • Skill 1
• Skill 2
• Skill 3
• Skill 4
• Skill 5 | • Progress 1
• Progress 2
• Progress 3 | • Role 1
• Role 2
• Responsibility 1
• Responsibility 2 | • Evaluation 1
• Evaluation 2
• Team
• Individual, etc. | • Contribution 1
• Contribution 2 |

Phase 3. Understanding Challenges

<table>
<thead>
<tr>
<th>Supervision</th>
<th>Errors/Mistakes</th>
<th>Hindering Factors</th>
<th>Advice</th>
<th>Suggestions</th>
</tr>
</thead>
</table>
| • Minimal
• A lot
• Not much
• Depends, etc. | • Error 1
• Error 2
• Error 3 | • Factor 1
• Factor 2
• Factor 3
• Factor 4
• Factor 5
• Factor 6
• Factor 7, etc. | • Advice 1
• Advice 2
• Advice 3 | • Feedback 1
• Feedback 2
• Feedback 3 |

Phase 4. Partnership Opportunities

<table>
<thead>
<tr>
<th>Past Collaboration</th>
<th>Ongoing</th>
<th>Future Plans?</th>
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</thead>
<tbody>
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</table>
Phase 1. Early Recruitment Stage

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• Requirement 3 |

Phase 2. Project Involvement and Performance Stage

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<th>Evaluation</th>
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Phase 4. Partnership Opportunities

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APPENDIX H. CUREB-B Ethics Clearance Form

Office of Research Ethics
4500 ARISE Building | 1125 Colonel By Drive
Ottawa, Ontario K1S 5B6
613-520-2600 Ext: 4085
ethics@carleton.ca

CERTIFICATION OF INSTITUTIONAL ETHICS CLEARANCE

The following research has been granted clearance by the Carleton University Research Ethics Board-B (CUREB-B). CUREB-B is constituted and operates in compliance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2).

Ethics Clearance ID: Project # 115467

Project Team Members: Anna Kabjin Kim (Primary Investigator)
Dr. Thomas Garvey (Research Supervisor)

Study Title: Industry Insights: Assessing Canadian Undergraduate Industrial Design Practica Through a Corporate Lens

Funding Source: (If applicable):

Effective: April 06, 2021          Expires: April 30, 2022

This certification is subject to the following conditions:

1. Clearance is granted only for the research and purposes described in the application.

2. Any modification to the approved research must be submitted to CUREB-B via a Change to Protocol Form. All changes must be cleared prior to the continuance of the research.

3. An Annual Status Report for the renewal or closure of ethics clearance must be submitted and cleared by the renewal date listed above. Failure to submit the Annual Status Report will result in the closure of the file. If funding is associated, funds will be frozen.

4. During the course of the study, if you encounter an adverse event, material incidental finding, protocol deviation or other unanticipated problem, you must complete and submit a Report of Adverse Events and Unanticipated Problems Form.

5. It is the responsibility of the student to notify their supervisor of any adverse events, changes to their application, or requests to renew/close the protocol.

6. Failure to conduct the research in accordance with the principles of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans 2nd edition and the Carleton