Investigating the experience of students with disabilities in Australian engineering and information technology work placements

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Work-integrated learning (WIL) placements seek to improve employability for all, but increasing evidence suggests equity groups see significant barriers in accessing WIL, in part due to existing barriers to work and study. This project sought to investigate the experiences of students with disabilities in engineering and IT WIL through a participatory research approach. Students with disabilities were invited to join a series of workshops to investigate WIL experiences through shared reflection and critique. The group was led through a Design Thinking process using numerous tools including empathy mapping, journey mapping, and yarning, to help elicit and frame the experiences. Participants identified significant discrimination and a lack of connection, community, and support as key issues. To address these, participants recommended developing community and connection among students, providing workshops on employment tailored for disability, greater support from universities, and greater training for university and industry staff on accessibility, inclusion, and legal requirements.

Keywords: Internships, disability, inclusion, participatory, engineering, information technology

People with disabilities face significant barriers in work and study. Less than half of people with disabilities in Australia are employed and those who are employed have lower rates of full-time employment (Australian Institute of Health and Welfare, 2020) with similar statistics found overseas (e.g., Office of Disability Employment Policy, 2021; Statistics Canada, 2017). Similarly in higher education, people with disabilities are underrepresented and are often under supported (Koshy & Seymour, 2015).

Work-integrated learning (WIL) is the intersection of work and study and seeks to improve employability outcomes for all. While there is limited research in this space regarding students with disabilities, there is increasing evidence many equity groups are seeing significant barriers in accessing WIL (Boye, 2022a; Lloyd et al., 2019). Given that students with disabilities already encounter significant barriers in both work and study and that there is increasing evidence equity groups in general face barriers in this space, it is likely students with disabilities face significant compounding challenges as well.

With universities and governments strongly advocating for the inclusion of WIL placements in university programs, particularly in areas such as engineering and information technology (IT), students are increasingly expected to meet WIL requirements to obtain their degrees. In addition to completing these WIL requirements, in areas such as engineering and IT they often need to secure an employer themselves. This indicates that there is likely limited vetting of workplaces to provide quality experiences. Given the reportedly low supportive employment opportunities available to people with disabilities, the limited assistance with vetting and finding a placement would disproportionately impact students with disabilities.

Although engineering and IT industries have become more open to and inclusive of diverse workforces in recent years, the responsibilities and expectations for students, universities, and employers

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participating in WIL programs can be unclear and vary greatly, with most employers taking full responsibility for students on a day-to-day basis while on placement. This can leave students vulnerable to the culture, inclusion, and accessibility practices of their WIL workplace and could be a significant barrier to full and equitable participation.

This work investigates the experiences of students with disabilities in engineering and IT WIL placements through a participatory research approach. Through this work, actionable recommendations for WIL programs are developed to improve the outcomes of students with disabilities in WIL.

BACKGROUND

Disability

The World Health Organization (2022) defines disability as impairments and health conditions that last longer than six months and cause moderate to severe impacts on the person's life through the interaction between the condition and contextual factors such as societal attitudes, access to infrastructure, discriminatory policies, age, or gender. They estimate that approximately one in six, or more than a billion people, have a disability globally (World Health Organization, 2022). Due to the large proportion of people with disabilities, it is likely most people will encounter disability in their lives either directly through having a disability, or indirectly through family members and friends, colleagues and employees, or customers and clients. Given this, it is important that institutions, workplaces, and individuals arm themselves with knowledge and skills to support people with disabilities.

Disability Language

In academic writing person-first language such as *people with disabilities* is typically the used and accepted language for disability, this convention is largely adhered to in this paper. However, there are many disability communities that have developed a strong sense of identity regarding their disabilities and who often have differing language conventions. Many of these communities prefer identity-first language with their identity capitalized; for example, the *Autistic* and *Deaf* communities. When referring to Autistic or Deaf people in this paper their generally preferred language is used. For further details on disability language see Dunn and Andrews (2015).

Workforce Participation

While the statistics vary by country, employment rates for people with disabilities are typically between two-thirds and as low as one-third of the rate for the general population. For example, in Australia, 80% of the working-age population is employed, however, the employment rate for people with disabilities is only 48% (Australian Institute of Health and Welfare, 2020). Similarly in the USA and Canada, employment rates are reported as 70% versus 29% (Office of Disability Employment Policy, 2021) and 74% versus 47% (Statistics Canada, 2017), respectively. Even when people with disabilities are employed, the rate of full-time employment is lower which further contributes to the lower median incomes of people with disabilities (Australian Institute of Health and Welfare, 2020; Morris et al., 2018).

Previous research has shown that people with disabilities experience a lack of support and discrimination in the workplace including in performance management, hiring, unfair terminations, interpersonal behaviors, institutional neglect, and in refusal of reasonable accommodations (Gouvier

et al., 2003; Graham et al., 2019; Robert & Harlan, 2006). While the research is limited, it is believed that the low employment participation is largely due to this discrimination faced by people with disabilities (Jurado-Caraballo et al., 2022).

Education

Many universities provide accommodations for people with disabilities to help support them in their studies, particularly universities in countries with strong anti-discrimination laws. However, evidence suggests that there are still systemic barriers in higher education, including a lack of support to access university systems and procedures not designed for accessibility (Kimball et al., 2016). In addition, engineering, IT, and computer science students with disabilities are often not supported effectively in their studies (Cunninghame et al., 2016; Ryan, 2007), this can also extend to active discouragement from enrolling in engineering, IT, and computer science (Alston et al., 2002).

In part, these barriers account for the lower success and retention rates in higher education for students with disabilities (Cunninghame et al., 2016) and have led to a significant and persistent underrepresentation of people with disabilities in higher education. For example, in Australia, only 6% of students self-identify to their institution as having a disability, compared with the national percentage of people with disabilities at 18% (Cunninghame et al., 2016; Koshy & Seymour, 2015). While self-reporting numbers are likely an underestimate, it is unlikely this could fully account for the significantly lower percentage in higher education.

Work-Integrated Learning

WIL is defined as activities where students are linked with industry in authentic ways to develop professional skills in context (Billett, 2009) and through their work tasks integrate their disciplinary theoretical knowledge with real-world practice (Zegwaard & Pretti, 2023). WIL is included in programs to improve students' employability and graduate career outcomes through the development of career-related skills, professional networks, and work experience (Jackson & Wilton, 2016; Silva et al., 2018; Smith et al., 2014; Thune & Støren, 2015; Tiessen et al., 2018). Increasingly, the focus on employability in higher education has led to the inclusion of WIL placements as mandatory components of degrees. This is particularly true in professional fields such as engineering, IT, and health sciences.

Considering the widely reported benefits of WIL (Jackson & Cook, 2023), it is expected that WIL could support equity groups to develop career-related skills and enter the workforce. However, many underrepresented groups such as people with disabilities who could benefit from WIL have limited access to these opportunities (Jackson et al., 2023; Lloyd et al., 2018; Paull et al., 2019). There are several factors influencing the lack of WIL opportunities for equity groups, including having less social capital (Lloyd et al., 2018; Paull et al., 2019) and a limited number of placement positions overall making positions more competitive (PhillipsKPA Pty Ltd, 2014) with equity groups struggling to compete. In addition, where WIL programs are optional, they often include a Grade Point Average or similar academic merit based entry criteria, which can disproportionately impact equity groups who may have been disadvantaged in their education and may not meet these criteria (Patrick et al., 2008; Peach et al., 2016; Tomlinson, 2017).

While there are studies that investigate experiences in WIL for other equity groups or equity as a whole (Itano-Boase et al., 2021; Lloyd et al., 2018; Paull et al., 2019), there are few that specifically research the experiences of students with disabilities. However, recently Gatto et al. (2021) found that disability contributes to low participation rates. Students with disabilities are motivated to participate in WIL

placements, however, they are concerned about being accepted by employers and whether their requests for accommodations will be met without discrimination or judgment (Dollinger et al., 2023).

Given the already significant barriers students with disabilities face in accessing both education and work and the limited research on WIL for students with disabilities, further research is needed to ensure WIL is a transformative experience instead of an additional barrier. Future studies should investigate the experiences of students with disabilities in WIL placements and the impacts of WIL on their professional development, health, and wellbeing.

Participatory Research and Conceptual Framing

Historically many equity groups, people with disabilities included, have been the objects of study and dehumanized in their lives and in research (Altermark, 2017). One of the most overt examples of dehumanization in disability was the historical institutionalization of people with disabilities where they often were subjected to very poor conditions including being researched upon without consent (Altermark, 2017). While the post-institutional era has improved the lives of many, there is still significant paternalism, mistreatment, and discrimination.

Hunt (1981) presents an account of disability research where those who were seeking to be heard engaged researchers to assist them. However, they were betrayed by the "detached, balanced, unbiased social scientists" (p.4) and the relationship became "parasitic," where the researchers saw what they wanted to see and presented findings that benefited themselves, diminishing the voices of the people further, "the main subjects of this process do not feature except precisely as objects about whose existence someone else is to be given greater knowledge and competence" (p.8). Accounts like these illuminate the extent to which researchers have historically failed people with disabilities. However, as Arstein-Kerslake et al. (2020) outline, this is not merely historical. Problematic studies and philosophies both continue to be undertaken as well as continue to influence modern thinking, laws, policy, practice, and research (Arstein-Kerslake et al., 2020).

Researchers, like those above, have claimed to detach themselves from their research in search of truth devised through observation as an unbiased third party. In reality, this is likely an unobtainable goal. All research and researchers are inherently biased to some extent; researchers bring with them their experiences, ideologies, and privileged position as researchers, and this influences everything from the fundamental questions asked to the framing and methods chosen, to the way data is interpreted and reported (Mantzoukas, 2005). That is not to say bias is irrelevant and should be ignored. Guillemin and Gillam (2004) suggest that constant reflexive practice throughout the life of a research project is an ethical imperative to assist in illuminating bias and critically reflecting on research decisions. However, reflective and reflexive practice can only address personal biases but does not address representation and empowerment for participants.

To better serve these communities, research is increasingly incorporating philosophies such as critical and feminist theories and methodologies such as participatory research and co-design (Priestley et al., 2010). Participatory research is an approach to research that emphasizes engagement with stakeholders and is a research-to-action approach that incorporates systematic inquiry in direct collaboration with those impacted by the issues being investigated (Cargo & Mercer, 2008). It is a spectrum of inquiry that incorporates a continuum of engagement with stakeholders from informing to empowering, from outreach to shared leadership, and everything in between (Vaughn & Jacquez, 2020). This approach allows the integration of researchers' theoretical and methodological expertise with the lived experiences of those affected by the issues being investigated. This approach produces results that can

be better translated into community and non-academic settings (Cargo & Mercer, 2008; Vaughn & Jacquez, 2020). While the names can vary for participatory research methodologies by discipline (e.g., Community Engaged Research, Community Science, Decolonizing Methodologies, Participatory Design, etc.), all share the core value of engaging with those who are typically the subject of research and researched on (Vaughn & Jacquez, 2020) to inform real-world impact.

METHODOLOGY

This work takes a critical theory lens and a participatory research approach, seeking to elevate the voices of students with disabilities to explore and understand "what is the experience of engineering and IT students with disabilities in looking for and working in Australian work-integrated learning placements?"

Through a series of three workshops over three consecutive days, participants explored their experience of WIL using the Design Thinking process and tools (Tschimmel, 2012). Design Thinking was chosen as a framework that participants had already encountered in their degrees so that participants could focus on the work and not the tools. In addition, the framework is a common approach for human-focused research-to-action work, which aligns with the aims of this work. The group was tasked with empathizing with each other and the broader disability community, identifying key challenges that students with disabilities face in WIL placements, and finally developing potential solutions to these problems.

Workshop Structure

In larger groups, quiet voices can be lost, which would go against the philosophy of Participatory Research. Participatory Research methods should offer "the ability to speak up, to participate, to experience oneself and be experienced as a person with the right to express yourself and to have the expression valued by others" (Abma et al., 2019, p. 127). To ensure all participants had a voice in the workshops two main tools were used, think-pair-share and yarning.

Traditionally, yarning has been incorporated into qualitative studies with and by Aboriginal and Torres Strait Islander Peoples from Australia and is a process whereby knowledge, learning, and experience are passed on through storytelling and deep listening (Barlo et al., 2020; Bessarab & Ng'andu, 2010). When participants provide their thoughts and experiences, they are providing a gift of themselves. To respect that, yarning asks the listeners to recognize and allow the speaker to speak in whichever direction and to whatever length they deem appropriate, providing them space, control, and freedom. Active listening promotes inclusion in the yarning space (Barlo et al., 2020).

Yarning was chosen in consultation with an Aboriginal Australian colleague who works in the Aboriginal and Torres Strait Islander research space. Through discussions with her, many parallels were determined between work in the Aboriginal and Torres Strait Islander space and the disability space. Yarning was incorporated in a culturally sensitive way to help develop trust and rich conversations with the participants.

During each workshop, participants engaged in individual, pair/small group, and larger group activities. Participants first considered their thoughts before sharing them through a yarning process. When all participants had been heard, a facilitated discussion brought it together with new thoughts emerging. Design Thinking tools such as empathy maps and journey maps were used throughout to frame the process and discussions and to provide a focus point.

To limit the potential impact on participants' health, the workshops were designed to be two hours, although workshops ran slightly longer as the participants wished to continue the discussions. The first workshop focused on sharing personal experiences and developing empathy maps to document and explore the commonality between experiences. The second workshop continued the exploration of shared experiences through a journey mapping exercise, mapping the highs and lows of looking for and working in a WIL placement. In the final workshop, participants pulled from the various activities to identify the key problems and developed potential solutions. Where possible and with permission, the workshops were audio recorded and materials were collected and photographed.

Ethics and Due Care

Given the personal nature of disability and that discussion of work, discrimination, and other barriers can be distressing, care was taken to minimize potential impacts on participants. The researcher undertook disability awareness training and mental health training prior to the commencement of the study. A free counseling service was also available for any participants who were experiencing distress.

In addition, to ensure all participants were able to access the workshops and fully participate, a personal participation plan was developed for each participant prior to the workshops. Access needs for pre-, during and post-workshop were discussed with each participant, as well as any medical or mental health issues they wished to raise that may occur during the workshops and what to do in the event of these events occurring.

This work was approved in line with the University of Technology Sydney's Human Research Ethics Committee guidelines, approval number ETH21-6364.

Reflexive Statement and Potential Biases

This work was led by a person with a disability. There is a bias here with the research lead being an *insider* with experience in the phenomenon being investigated. However, this also presents a unique opportunity to build trust, develop rich stories with participants, and provides a shared understanding and language between participants and the researcher (Dwyer & Buckle, 2009). At the time of the workshops, participants were informed that the researcher had a life-long severe vision impairment caused by Oculocutaneous Albinism. This assisted participants to feel safe speaking openly about their thoughts and experiences, a space that would be difficult to replicate with an *outsider* facilitating, potentially leading to the development of less rich pictures of WIL experiences (Dwyer & Buckle, 2009).

It should also be noted that the researcher previously held the role of WIL program coordinator for the program that most participants had completed and is the Accessibility Liaison Officer assisting implement student access plans for their faculty. Care needed to be taken to ensure participants felt safe to speak openly given the background of the researcher. However, he had not directly interacted with the participants through those roles prior to the workshops and participants were informed of the background of the researcher to provide transparency. While there is a potential bias in that the researcher was researching a program that they previously were invested in, ultimately, the background of the researcher provided a deep understanding of the institution and the WIL program which benefited the depth of conversations and research (Brannick & Coghlan, 2007; Fleming, 2018).

Participants

Participants were recruited from the researcher's university (with approval from the faculty dean) through the student newsletter and direct email to registered students with disabilities. This provided an opportunity to conduct the workshops in person in a familiar space for participants and meant the researcher and participants had a common language and understanding. Participants were selected to provide a broad spectrum of disabilities and experience with WIL, as well as diverse demographics (e.g., gender) where possible.

Nine students participated in the workshops, as represented in Table 1. Eight participants were from a Bachelor of Engineering degree and one was from an IT degree. All participants had looked for a WIL placement as part of their degree, however, three had not secured one at the time of the study. The most prevalent disability type was a mental health condition, which five participants listed. However, the remaining participants had a wide range of disabilities including Attention Deficit Hyperactivity Disorder, Autism Spectrum Disorder, intellectual disability, physical disability, and deaf or hard of hearing. Some participants had multiple/comorbid disabilities.

TABLE 1: Participant demographics.

Degree	Major	Has looked for an internship as part of their degree	Has participated in an internship as part of their degree	Indicated disability(s)
Bachelor of Engineering (Honours)	Flexible & Mechanical	Yes	Yes	Mental health conditions
Bachelor of Science in IT	Business Information Systems	Yes	No	Intellectual disability
Bachelor of Engineering (Honours) Diploma in Professional Engineering Practice	Civil	Yes	Yes	Mental health conditions
Bachelor of Engineering (Honours) Diploma in Professional Engineering Practice	Biomedical	Yes	Yes	Mental health conditions
Bachelor of Engineering (Honours)	Construction	Yes	Yes	Mental health conditions, ADHD
Bachelor of Engineering (Honours)	Civil & Environmental	Yes	No	Autism spectrum disorder, Physical disability
Bachelor of Engineering (Honours)	Mechatronic	Yes	Yes	Mental health conditions
Bachelor of Engineering (Honours)	Mechatronics	Yes	No	Deaf or hard of hearing
Bachelor of Engineering (Honours)	Civil Structural	Yes	Yes	ADHD, Other

FINDINGS

Workshop 1: Empathize

On day one, participants were first introduced to the project. Then, to assist participants think about their own experiences before learning about and being influenced by the experiences of others, they were asked three reflective questions.

Question one asked participants to reflect on why they chose to participate. Participants almost universally indicated the main reasons were a desire to share their experience to help others and a desire to hear others' experiences and insights. For example, one participant noted that they wanted to "share my experiences in finding an internship and the struggle to find one. Listen to other people's experiences and get insight from them."

Question two asked participants about their WIL experiences. Participants indicated that finding a placement was difficult, reasons included anxiety, overwhelming processes, imposter syndrome, lack of qualifications, disability limiting capability, and intersectional issues, for example, both disabled and an international student. One participant noted that "finding work was difficult. I feel like a lot of the time it was difficult to even apply because I felt like I wasn't qualified, or my disability would make it difficult to do so." Participants also indicated several issues in the workplace, including communication difficulties particularly around accommodation needs, anxiety attacks, fatigue, conflict with team members when not able to do as much work as others, and perceived hurdles.

Question three asked about other work-related experiences. This question was intended to tease out further work experience, particularly from those who had not completed their WIL placement yet. Similar responses to questions one and two were given including difficulty finding support, competing with "functional" candidates, communicating with managers, conflict resolution, and perceptions that the workplace is not supportive of people with disabilities. For example, one participant noted, "Difficulty finding a workplace that will give me a chance. Usually [the] job … has a candidate that's highly functional."

After the individual reflection, a round of yarning commenced where participants introduced themselves and recounted their stories. Participants then split into two groups to do an analysis of their own experiences and the experiences they heard through an empathy mapping exercise. The participants are not trained in thematic analysis or similar techniques. However, by providing prompting questions, the map allows participants to code and theme the various experiences they had and heard and thus the mapping exercise can be viewed as a lower bar to entry for such techniques. The results of both maps are combined and presented in Table 2. As these are group exercises, it is not possible to attribute each note to an individual participant. Some participants used strong language, including profanities, to express themselves. While these comments have been censored for publication, the strong emotions they convey in the discussion are of note.

Workshop 2: Empathize and Define

On day two, participants reviewed the empathy maps from the previous day, and together identified areas that upon reflection were still missing from the empathy maps. The additions to the journey map from day two are indicated in Table 2 using a ^.

TABLE 2: Participant quotes from their combined Empathy Maps.

Who are we empathizing with? Who is the person we want to understand? What is the situation they are in?	**What do they need to do or do differently?** Jobs they need to get done? Decisions they need to make? Measurements of success?	**What do they hear?** From others? From friends? From colleagues? Second-hand?
Students with disabilities – finding work [or] worked before Students with disabilities trying to get their foot in the door	Different for everyone, hard to say Part of the problem is the person not knowing what they need Initiate communication, give and obtain feedback Figure out what we need to get things done Training, supervision, experience -> Catering to 1st time workers Build up confidence Chance to develop soft skills Feel valid	"Constructive" feedback -> in front of everyone "Are you ok?" -> feel the need to explain yourself Wrong Bad feedback -> rude -> not giving effective feedback" Mean unhelpful "you're not good enough" "Isn't that for failures?" "it's canceled (you're canceled)"
What do they see? In their immediate environment? Others saying and doing? What are they watching/ reading?	**What do they say?** What have we heard them say? What can we imagine them saying?	**What do they do?** What do they do today? What behavior have we observed? What can we imagine them doing?
Job Description -> high hurdles -> Other students fit into it better Others doing better Not seeing bigger picture @ workplace Understanding the value of our work What happens when we finish our work is it bad 10x the challenge Bad training -> for trainers Looked down upon Looking @ others' problems Interviews are a bull***t game at which we are inherently s**t at Younger people getting ahead and us being left out	Unheard -> power difference, unable to talk about mental health issues Male dominated workplace -> difficulty to speak up [as a woman] I haven't been given the chances I need I've had s**t luck I do not want to be seen as disadvantaged or with a disability or limited ^	Not speaking up Getting overwhelmed Getting stuck and not looking for additional opportunities Feel like an outcast -> isolate[d] Suffer -> put others' needs before ours We get stuck in terms of both emotion and career development Unhealthy thought patterns develop Exist in pain Look for alternate pathways Prove their worth, trying to go above and beyond ^ Trying to compromise with employer -> initiate convo when things go wrong ^

What do they think and feel? Pains. What are their fears, frustrations, anxieties?	What do they think and feel? Gains. What are their wants, needs, hopes, and dreams?	What do they think and feel? What other thoughts and feelings might motivate their behavior?
Attitude you need to deal with	Empathy and understanding	Compromise
Misunderstood – labeled insignificant	Be your best self	Accommodating supervisor -> listening to ongoing needs
Not being acknowledged	Learn	
Fear -> Unable to meet the standards for normal people	Find job	Determination vs Apathy
Rejection	Break out of the cycle	We are worth investing in ^
Wasting/losing time	"outrun" our disability	Imposter syndrome ^
Feeling inadequate and used	Find stability	
Not being understood or respected	Be accepted	
Other		
Different people can get the job done, having bringing different skillsets	"What tripped me up" vs "what can I do better"	

Note. Quotation marks indicate the participants themselves included quotation marks surrounding those words or sentences. Additions to the journey maps from day two are indicated using a ^.

Participants then split into three groups to complete a journey map of their combined experiences looking for and beginning a WIL placement. Upon completion, they shared and discussed them with the whole group. All three maps indicated the ups and downs during the entire experience of a WIL placement, with the most acute issues tending to fall in the early stages when students are looking for and applying for work.[2]

Key internal impacts from WIL that were illuminated by the journey mapping and accompanying discussion included emotional distress, anxiety, stress, frustration, hopelessness, isolation, fear of rejection, fear of disclosure, and imposter syndrome. There were also some internal highlights of excitement, sense of accomplishment, and acceptance.

Participants also identified external factors such as a lack of support, lack of resources, time-consuming processes, lack of transparency in processes (e.g., no response from applications), discrimination, workplace conflict, and job hunting and full-time work getting in the way of other important commitments (e.g., medical or therapy appointments). Highlights for participants included one-on-one time with supervisors, constructive feedback, support groups, and talking with peers.

Workshop 3: Define and Ideate

On day three, participants were split into three groups and consolidated everything that had been discussed so far into a problem map, defining the key issues that students with disabilities face. Each group took a slightly different approach to the problem maps yet they developed many interrelated problems to be considered.

The key takeaways for the participants from the mapping, included assumptions and lack of knowledge about disability by employers, lack of appreciation for strengths by employers, lack of support from supervisors, communication breakdowns between neurotypical staff and neurodivergent interns, lack of support to prepare for and develop skills to look for and work in placements, lack of support to understand disclosure pros and cons, difficulty finding a supportive employer, feelings of isolation and lack of community, difficulty finding information about university policies and support, lack of individualized support in this space, difficulty finding paid work, pressures to compete with non-disabled people, and lack of communication between employers and the university.

Through the workshopping process, participants identified several key recommendations based on the issues discussed. For brevity, these are presented in the discussion section below.

DISCUSSION

Participants entered the workshops nervous but keen to support the research as they had lived experience with WIL placements and felt that they were an important area for research and change. It was clear that all the participants had experienced significant challenges in finding placements and many had also experienced significant challenges in the workplace. Some also had positive experiences of growth in the workplace. Participants were keen to share these experiences and to hear from others in similar positions to their own, which they had not previously had the opportunity to do. Through the development of trust between the participants, the facilitator, and one another, the participants were able to feel safe and quickly opened up about their experiences. Throughout the process,

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[2] Unfortunately, as the journey maps and problem maps are quite complex and large, it was not possible to provide a clean version of these for publication, however, the corresponding author can provide these upon request.

participants reflected on how positively they felt about having a safe space to discuss these issues and how they often felt isolated and wished to have a supportive community (which speaks to Recommendation 9 below). This was a space none of the participants had experienced before.

Participants were given autonomy to discuss and analyze the themes which led to varying approaches for each small group, but ultimately very similar results were developed by each group. By providing autonomy, participants were able to develop ideas that were of most importance to them even where these may sit slightly outside the expected foci, such as Recommendation 9 which would support students in WIL but is broader than WIL.

It should be noted that the maps the participants developed did not contain all insights that they identified. For example, the need to accept unpaid work to complete WIL requirements was discussed at length but was not explicitly included in participant notes. While it appears that many of these insights were considered throughout the process, participants should be encouraged to take notes throughout the process to ensure such insights are not lost.

Each of the nine main recommendations the participants developed are outlined and discussed below.

Recommendation 1: Develop Understanding with Employers Regarding the Strengths and Benefits of Diversity Brought by Students with Disabilities

Participants identified a lack of understanding from employers around disability and inclusion, particularly around the benefits of diversity. It was also identified that employers often make false assumptions about people based on their disabilities. While some employers embrace diversity and find significant benefits, participants believed that many see disability as a burden. This theory is backed by research, with studies showing that some employers perceive disability negatively. In addition, some employers claim to have a positive opinion of employing people with disabilities, however, researchers have still found discriminatory hiring practices are common in this group (e.g., Bricout & Bentley, 2000; Burke et al., 2013; Heera & Devi, 2016). More work by universities, governments, and professional organizations needs to be done to educate employers on the benefits of diversity, particularly the benefits people with disabilities can bring.

Recommendation 2: Provide Support and Training to Employers and Supervisors to Better Understand Accessibility, Inclusion, and Legal Requirements

Participants identified that employers lacked knowledge of how best to uphold their legal responsibilities and support, include, and benefit from the strengths of people with disabilities. This leads to poor outcomes for disabled employees and discrimination against people with disabilities. Research suggests that people with disabilities face systemic discrimination in employment (e.g., Gouvier et al., 2003; Graham et al., 2019; Robert & Harlan, 2006) and this should be of significant concern to WIL practitioners and universities and governments. Requiring students to complete WIL placements in order to graduate potentially opens them up to discrimination and universities should take some responsibility for limiting this risk and potential impact from such occurrences. This recommendation asks universities to provide training and support to employers they approve for WIL placements to understand their responsibilities regarding disability and to provide advice on inclusion and supporting students with disabilities.

Recommendation 3: Provide a Workplace Mentor to Support Students with Disabilities in the Workplace

Workplace mentors were identified as one of the most impactful ways a workplace can provide support. A mentor can support students in their role as an intern, answer questions, and provide advice regarding navigating the workplace, particularly around seeking reasonable accommodations from their supervisor. While research has previously identified the invaluable benefits a mentor can provide to a young professional (e.g., Smith-Ruig, 2014; Wang et al., 2023), this is even more vital for disadvantaged and marginalized groups as they often lack social capital and experience additional and intersecting barriers to address (Lloyd et al., 2019).

Recommendation 4: Employers to Provide Greater Feedback to Students with Disabilities, Including Regular Check-Ins

Given the additional barriers and supports needed, it was identified that students with disabilities had common concerns around imposter syndrome, anxiety, uncertainty, and a sense they needed to prove they were "worth the hassle" including competing with non-disabled people. Feedback is necessary for all employees to improve and understand how they are performing (e.g., Farooq, 2011; Lee et al., 2021; Park et al., 2019) but given the additional barriers experienced by people with disabilities, it is even more vital they receive constructive feedback to better understand their performance, areas for improvement, and to alleviate their concerns.

Recommendation 5: Supervisors Should be Given Time in Their Workload to Provide Greater Support

Participants identified that even where supervisors are sympathetic towards students with disabilities, they often do not have time to support them to the best of their ability, with their other workload commitments typically taking precedence. Given the higher needs of interns for support and the intersection of that with disability, employers should provide supervisors additional time in their workloads to support all interns, but particularly students with disabilities.

Recommendation 6: Develop Workshops for Students with Disabilities to Better Understand Support, Disclosure, and Securing Placements

A key area of concern for the participants was around lack of knowledge about supports available, how to navigate employment with a disability, how to navigate disclosure, and other areas they felt ill-prepared for. Participants recommended workshops on employment and related skills specifically targeting students with disabilities be developed and run regularly. This could provide both advice on these topics as well as provide space for students to discuss these issues with each other.

Recommendation 7: Provide a Key Contact at the University to Support Students with Disabilities with WIL Placements

Universities are large, complex organizations that can be difficult for students to navigate, particularly students from equity groups (e.g., disability, first-in-family, etc.). This can lead to students not knowing who to speak to about issues and not knowing what support is available. The participants identified this as a particular problem for WIL, as there were services many were not aware of, as well as issues around university-provided accessibility services not considering internships part of their area of responsibility and internships teams not considering disability part of theirs. This leads to a gap in support. It was suspected by participants that these issues are common in many universities. It is vital that staff involved in WIL and staff involved in supporting disability clarify responsibilities around

students with disabilities on placements and ensure the students understand who can support them and direct them to further support in this space. Participants recommended a dedicated WIL officer for students with disabilities would clarify these arrangements and provide greater support than is currently provided.

Recommendation 8: Universities to Check-In Regularly with Students with Disabilities that are on Placement

Participants identified key issues around isolation, uncertainty, and problematic workplaces while on placements. While employers have legal responsibilities to support employees with disabilities, the participants believed that the university also had a responsibility and duty of care to ensure that students on placement are supported and safe. The participants suggested that universities should be checking in regularly with students while on placement to ensure that they are not facing issues that should be addressed, as well as to provide advice. While all students would benefit from such a process and ideally universities would provide this, it is particularly important for students with disabilities as they face additional barriers and can be impacted to a greater degree by poor workplace culture and lack of support.

Recommendation 9: Develop Community Among Students with Disabilities to Facilitate Peer Support

The participants regularly expressed how beneficial they found having the space to talk about these issues was for them. Participating in the research was in itself a support. Participants expressed a desire for more spaces like this for students with disabilities to discuss issues they are facing with each other and that the university should work to create these spaces. This would provide a space where they can be honest about their experiences and be understood, as well as provide a space they can get peer support and advice.

LIMITATIONS

The nine participants were asked to consider the broader picture for students with disabilities in WIL, however, their work in the study is largely based on their own experiences. While this means there may be gaps that were not addressed by participants as these were outside their experience, it does not diminish the importance of their experiences and the ramifications for WIL. Research with a greater number of students from more diverse backgrounds would however be helpful.

Further, all participants in the study were from the same university. Being from the same university did provide participants with a shared language and experience which benefited the rich conversations, however, it also limited the scope of experiences of WIL to largely one implementation. While many WIL programs (particularly in engineering) are quite similar, the fact that only one program was represented is a limitation.

Further work in this space would benefit from a broader cross-section of participants, both in terms of disabilities and intersectional backgrounds as well as participants from more universities and programs.

CONCLUSION

WIL placements can be a transformative experience for students, allowing them to build experience and career-related skills. However, not all students have the same access to WIL placements. Students with disabilities already face significant challenges and discrimination in education and work, and

while WIL placements can help students with disabilities break through these barriers, there are challenges in WIL that still need to be addressed before this can be achieved.

Through the research workshops, the participants identified connection, community, access to supports, and a lack of non-discriminatory opportunities as key issues for them. To address these issues the group recommended several foci including:

- Developing community and connection among students with disabilities as well as between students and their university
- Providing workshops on employment tailored for students with disabilities
- Providing greater support to students with disabilities on placements
- Facilitating training for university staff and industry supervisors on accessibility, inclusion, and legal requirements

WIL programs should consider these recommendations and explicitly consider diverse groups such as people with disabilities in all stages of program development from conceptualization to the day-to-day running of the programs. Programs should provide support to students with disabilities and the support that is available should be easy to identify and access. Finally, beyond WIL placements, more should be done to promote community among students with disability and between students and the university, providing students with a network and the social capital to find support and opportunities in both WIL and more broadly.

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