

# Enhancing Graduate Attributes through Work-Integrated Learning: Students' Perspective

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## Abstract

Work-integrated learning inspires students to embrace prospective future careers, thereby contributing to economic innovation and growth. Universities must incorporate work-integrated learning into the curricula to promote students' personal and career development goals. It enables students to integrate theory and practice and to assess their experiential learning as well as exposing them to the world of work. This study investigates the contribution of work-integrated learning to enhancing graduate attributes of industrial design students at the University of Botswana. Few in-depth studies have assessed how work-integrated learning enhances the graduate attributes of industrial design students. A case study was conducted with 21 University of Botswana industrial design students. The results were based on students self-reporting after undertaking a 14-week work-integrated learning experience. The participants reported that 98% of the graduate attributes were positively attained. Teamwork and adaptability were the top two graduate attributes that were perceived to have been attained. The results suggest that work-integrated learning enables students to learn by doing, which enhances personal and professional graduate attributes important to gain employment and succeed in the workplace. Consequently, institutions of higher learning must review their teaching and learning pedagogies to align them with the needs of the work environment, civic engagement and the fourth industrial revolution to produce technically and professionally competent graduates. The curriculum review should also foster a decolonial and transformative lens in higher education in the Global South.



**Keywords:** graduate attributes; work-integrated learning; industrial design education; undergraduate; employability; Botswana

## Introduction

The gap in skills between what university graduates possess and what the industry needs is problematic, and universities are under increasing pressure to bridge this gap (Chetty 2012; Govender and Wait 2017). Therefore, the collaboration between universities and industry is considered crucial in preparing graduates with relevant skills for the world of work (Ceschin, Rakowski, and de Vere 2017). This calls for universities to develop their curricula to enable students to become familiar with the world of work before graduating. Such an approach enables universities to produce high-quality entrepreneurial and employable graduates. It also meets the employers' demand for graduates who are proficient in 21st-century skills or discipline-specific knowledge, skills, and attitudes, as well as generic cognitive, behavioural and technical skills and attributes that will enable them to cope with the ever-changing technological work environment (Govender and Wait 2017; McCabe 2010).

Graduate attributes, generic skills, soft skills, or key transferable skills have received some attention in higher education in the previous decade because it was realised that there is a discrepancy between the skills students acquire during their studies and the skills that industry needs (Dichabeng and Moalosi 2016; Moalosi, Molokwane, and Mothibedi 2012; Moalosi, Oladiran, and Uziak 2012). Additionally, there have been calls for universities to produce more employable graduates and that employability requires the development of graduate attributes (Jackson 2015; Nguyen, Tran, and Le 2019). In addressing these challenges, many universities have developed policies and guidelines on how graduate attributes can be incorporated within work-integrated learning (WIL).

Work-integrated learning is a curriculum design which allows students to spend time in professional work or other practice settings geared towards connecting classroom learning and on-the-job experience relevant to their area of study and their occupational futures (Doolan et al. 2019; Kramer and Usher 2011; Smith 2012). WIL is an amalgamation of professional work experience with classroom learning, thus linking theoretical classroom learning with practical workplace skills (Smith, Ferns, and Russell 2016). Govender and Wait (2017) argue that classroom-based teaching alone does not produce future-fit graduates and therefore the role of work-integrated learning is to encourage learning by doing. It can take various forms such as a work placement, internship, service-learning, industrial attachment, cooperative education, practicum, or community service (Kramer and Usher 2011; Smith 2012). Incorporating work-integrated learning in the curricula leads to the development of work-ready graduates who can contribute positively to the needs of their employer and society (Doolan et al. 2019). WIL provides partnerships and benefits between universities, students, communities and industry that are derived from incorporating WIL into the curriculum. These include some of the following: producing work-ready graduates, providing

programmes that respond to the employers' and society's needs, gaining market advantage to attract the best students, producing adaptable and transformative graduates capable of initiating and responding to the ever-changing work environment (Smith 2012).

This article provides a background review of WIL viewed from a decolonial and transformative lens in higher education and investigates the role it plays in enhancing the graduate attributes of industrial design students at the University of Botswana. It also discusses the graduates' attributes as articulated in the *Learning and Teaching Policy* of the University of Botswana (2008) and elsewhere as well as the structure of WIL in the Industrial Design programme. The paper then outlines the methodology, presentation and discussion of the results and reflects on the practical implications of the results. It also discusses the limitations of the study and highlights future research directions.

## The Decoloniality Lens

Educators in the Global South need to examine the effects of colonialism by consciously interrogating their “being” and making strategic adjustments in curriculum transformation. For example, colonial education is highly theoretical and tends to produce graduates who are geared towards an employment-seeking mindset (Thondhlana et al. 2021). There is a need to move from employment-seeking to entrepreneurship and incorporate work-integrated learning as part of curriculum transformation. Furthermore, Mbembe (2016) adds that African universities are local instantiations of a dominant academic model based on a Eurocentric epistemic canon. Thondhlana et al. (2021) argue that this has become hegemonic and actively represses anything that is articulated, thought, and envisioned from outside this frame.

This is the time to change the status quo and to think differently about curriculum transformation and a new decolonised beginning (Becker 2021). It is time to think critically about what causes the disconnect between the skills students possess and those required by industry. García and Baca (2019) critique postcolonial studies by claiming that coloniality still dominates the world today, hence the lack of transformation in the education sector. Ndlovu-Gatsheni (2019) argues that decoloniality is specifically formalised by the colonised in the Global South to dismantle global relations of power and conceptions of knowledge reproducing racial, gender and geo-political hierarchies. He advances that colonialism and coloniality still constitute the discursive landscape within which many forms of domination and exploitation are embedded.

Decoloniality is viewed as an alternative for repelling and analysing modernity, colonialism and the colonial matrix of power (Becker 2021). Majee and Ress (2020) argue that decoloniality is a vital tool for challenging long-established claims on higher education held by Europeans and Americans as they have dominated academic knowledge production and distribution for a long time, and weaker, poorer nations followed their education system. A deep understanding of the coloniality of knowledge

enables the Global South to focus on teasing out epistemological issues, the politics of knowledge generation, and questions of who generates knowledge and for what purpose (Thondhlana et al. 2021). The geopolitics of knowledge production is argued to be a component of modernity (Maldonado-Torres 2007). Decoloniality can be achieved in several ways, as suggested by Mignolo (2018), such as protests, local and global movements, grassroots projects and engagements, delinking from top-down hegemonic knowledge and relinking to bottom-up pluriverse knowledge, and robust explorations of epistemological practices and curricula to transform higher education. Heleta (2016) suggests two approaches to transforming and decolonising the higher education curriculum: adding new knowledge to the existing curricula and making visible the enunciation of knowledge and how it constructs curricula. One way of transforming education is to consider embedding work-integrated learning in the higher education curriculum.

### Work-Integrated Learning

Work-integrated learning is an umbrella term used for a range of approaches that include industrial training, work-related learning, workplace learning, work-based learning, industrial internships, work placements, industrial attachments, student attachments, practicums, etc. (Jackson 2013; Renganathan, Karim, and Li 2012). It is meant to extend the university-acquired knowledge and build the capacities required to be an effective professional practitioner (Jeong and Mc Millian 2015). Such an approach facilitates deeper learning that occurs when students relate how their knowledge may be applied in the real-world context. Renganathan, Karim and Li (2012) argue that WIL has been designed to:

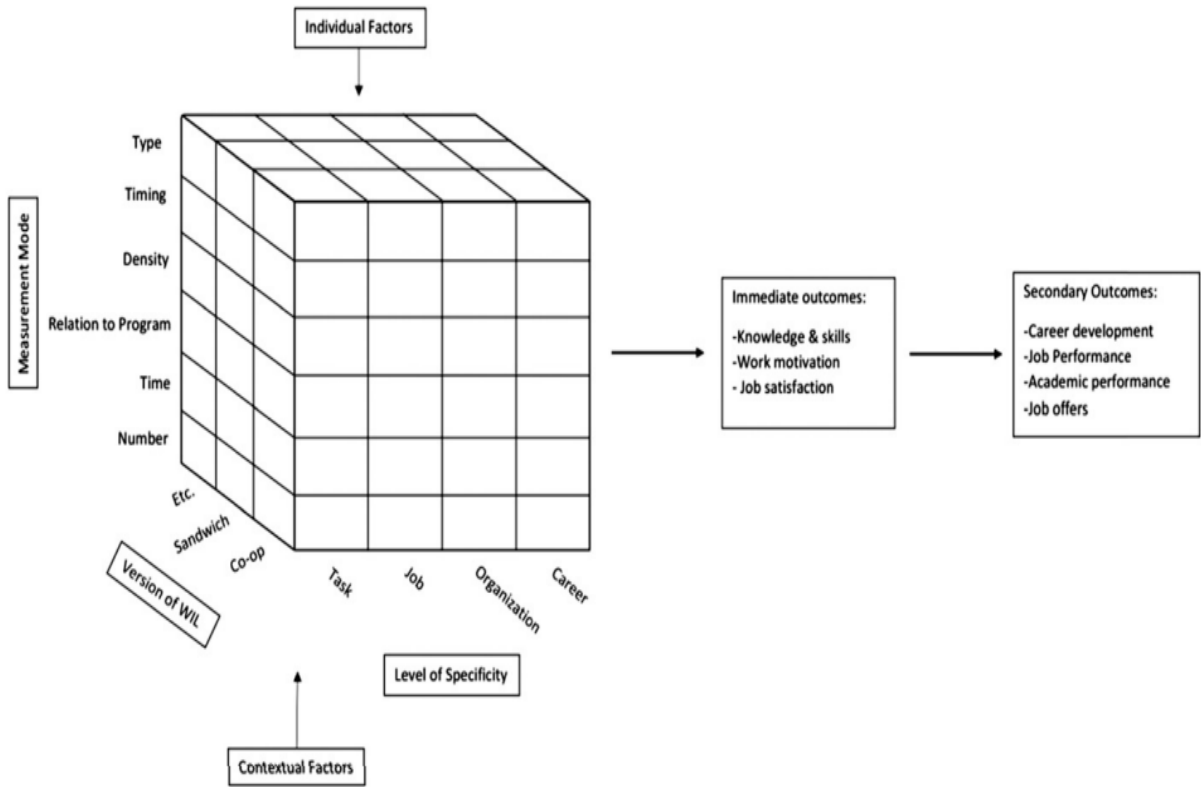
allow undergraduates to experience and gain practical knowledge in authentic professional environments before they graduate while allowing undergraduate students to incorporate work-related experience and knowledge into their formal education in a university by taking part in supervised and planned work in real-world professional environments. (Renganathan, Karim, and Li 2012, 180)

This has come about because of a continuous disconnect between the skills possessed by graduates and those required by the industry, and this results in poor employability skills. This situation is not only peculiar to Botswana's context—universities around the globe also experience the same, more especially in the Global South due to colonisation. When this disconnect is viewed through a decoloniality lens, it shows a continuation of the colonial education system. It is time to decolonise and offer an education system that is relevant to the needs of today's society. A study conducted in Malaysia by Renganathan, Karim and Li (2012, 180) found that “many undergraduates churned out by universities lack essential job market readiness skills, which in turn contributes to the increase in the number of unemployed graduates.”

The competitive nature of the national and global work environment demands that graduates not only have exceptional knowledge and skills but are innovative, dynamic

individuals ready to contribute to society and industry needs (Doolan et al. 2019). Skills required from graduates by industry include leadership and management skills, critical thinking, presentation skills, teamwork skills, communication skills and business acumen (Gamble, Patrick, and Peach 2010; Joksimovic et al. 2020; Renganathan, Karim, and Li 2012). While classroom learning attempts to encourage students to be independent in their learning, this is not always the case as the learning process is often centred on the teaching staff. This is due to several reasons such as the style of teaching, the method of delivery, assessment criteria and the relationship between the teaching staff and the students. While not disputing the value of skill acquisition, Jackson (2013) cites Wilton (2012) stating that the value of the placement is in personal development and fostering a tacit understanding of the demands of the working environment and employment rather than enhancing skills outcomes.

Rowe (2017) developed a model of work experience for work-integrated learning that is multidimensional, and it has several facets that are affected by several factors and have various outcomes (Figure 1). The first dimension in the model is made up of different levels of specificity, such as task, job, organisation and career. The second dimension of the model includes factors such as time, number, types, and relations to the academic programme. The third dimension of the model includes the form of WIL (cooperative learning, service-learning, internship, practicum, industrial attachment, etc.). Individual factors may affect work experiences, such as personality factors, a student's ability, motivation, or openness to experience to achieve. Likewise, contextual factors may influence work experience in WIL, such as the involvement of the WIL coordinator, the supervisor, other staff members, or the academic institution, and the work environment. Finally, there are primary (immediate) and secondary outcomes of the WIL experience. The primary outcomes are made up of skills, knowledge, abilities, and other attributes. These outcomes are important for the future employment and effective performance of students. The secondary outcomes include career development and job performance. Added in the WIL model to the immediate outcomes is job satisfaction, and academic performance and job offers make up the secondary outcomes (Rowe 2017).



**Figure 1:** Model of work experience for work-integrated learning

Academic performance is enhanced through WIL. Gamble, Patrick and Peach (2010) and Rowe (2017) concur that engaging in a WIL experience improves academic performance. WIL encourages a more participative, learner-centred approach, which emphasises direct engagement, rich learning experiences and the construction of meaning by learners (Renganathan, Karim, and Li 2012). Students who study problem-solving programmes such as engineering, technology, built environment, etc. are expected to apply themselves using both theoretical and practical knowledge. With the classroom being a primarily theoretical environment, Renganathan, Karim and Li (2012) state that allowing undergraduates to experience work in a real-world environment offers them a chance to apply theoretical knowledge learned in authentic work sites. The predominant theoretical knowledge gained in a classroom environment is made up of formal structured education, which is often guided by the teaching staff, whereas work placement experience promotes informal or incidental learning (Renganathan, Karim, and Li 2012). This eliminates the uniform distribution of knowledge and allows for different learning opportunities for every student.

WIL develops professionalism and ethical responsibility in students, and it allows them to engage in real-life activities in the work environment. This prepares them for an

unknown future (Bowen and Drysdale 2017). Students' participation in WIL increases their marketability when they graduate (Doolan et al. 2019; Renganathan, Karim, and Li 2012). With a large number of graduates coming out of universities globally on an annual basis, very few manage to find employment. Research from India and China states that 25% of graduates in India are considered employable and only 10% are considered employable in China (Gamble, Patrick, and Peach 2010). One of the reasons cited in this study is the disconnect between skills possessed by graduates and those required by employers. Moreover, some programmes do not have a work-integrated learning component. Nguyen, Tran and Le (2019) and Bowen and Drysdale (2017) report that students who have gone through WIL were favoured to secure employment, have a well-defined career progression, and earn better salaries. WIL benefits both students and university staff, especially in programmes that have a practical component, by establishing networks that are important for career advancement (Jackson 2013).

Universities are finding it more beneficial to establish working relationships with industry as it enables them to blend theory with application and remain relevant in adhering to current standards while producing not only research outputs but also industrially proficient students (Dorland et al. 2020). There is increased networking between universities and professional practitioners that may inform educators of any changes in current workplace practices, and this may shed light on the expected knowledge and skill standards in new graduates, which may facilitate a more industry-aligned curriculum design (Jackson 2013). Gamble, Patrick and Peach (2010) concur that staff capacity is enhanced through engagement with the real world that provides them with opportunities to stay abreast of current industry practices and offers them prospects to incorporate such new practices into their teaching. In addition to establishing meaningful relationships with employing organisations, joint research ventures between universities and organisations are catalysed through such interactions, with increased possibilities for other collaborative opportunities (Gamble, Patrick, and Peach 2010). Other benefits of WIL include working in a real business setting, developing a sense and awareness of the workplace culture, enhancing soft skills and advancing theoretical and practical knowledge, managing future career aspirations and decisions, boosting employment prospects, and using academic theory to offer real-life solutions (Nguyen, Tran, and Le 2019).

Doolan et al. (2019) outline the following challenges of WIL: limited time is allocated to actual engagement in placements due to universities' timetable restrictions; it works well if there is a conducive relationship that exists between the university and the industry partner, and this takes time to develop. Some industries view it as slowing down their productivity because production time will be spent training students. The increase in students' enrolment can dilute WIL because there is a limit to the number of entrants industry can absorb at a time and this leads to minimum students' engagement. Shirley et al. (2006) also argue that increased student numbers pose a challenge in placing students in relevant professional workplaces. WIL needs a systematic integration of theory and practice. "Without the integration of the theoretical

background and appropriate programme design, workplace learning becomes inefficient and is mere ‘work experience’ rather than a proper WIL experience” (Gamble et al. 2008, 2). Rook (2017) advances that some of the challenges of WIL implementation will include universities making a deliberate effort to reframe “their pedagogical approach to integrating theoretical, professional and experiential models of learning. This requires a remarkable amount of resources and commitment to WIL, it requires a change in perspective for academics and students” (Rook 2017, 201).

Therefore, this demand requires resources and commitment from staff, students, and stakeholders such as industry captains. At times it is difficult to manage the expectations and competing demands of stakeholders to maintain positive stakeholder relationships. The next section reviews WIL in the Industrial Design programme at the University of Botswana.

### Work-Integrated Learning in the Industrial Design Programme

The aim of work-integrated learning at the University of Botswana in the Industrial Design programme is to enable students to employ the skills they learnt during their studies and to acquire new skills in the areas of design, manufacturing, and the applications of new technology. The course runs for 14 weeks in the design industry and the government pays students for the WIL. This programme concentrates on industrial exposure for students to gain practical experience, hence sharing their knowledge with the industry. In doing so, they should enhance their knowledge and practical skills on the one hand, and critique the processes and methods used in the industry on the other. On successful completion of the WIL, the students should be able to demonstrate the following, as per the requirements of the Bachelor of Design (Industrial Design) programme (University of Botswana 2008):

- a) Knowledge and Understanding of the structure and operation of a company with special reference to the design processes.
- b) Subject Specific Skills:
  - 1) Intellectual/Cognitive skills: application of theoretical knowledge gained in the classroom to gain practical experience.
  - 2) Practical/Subject-specific skills: using tangible skills or core competencies to solve design challenges in a safe, efficient, and effective manner.
- c) Key transferable skills: critique the processes of designing and making products and services with due regard to the environment, time, cost, quality, and standards.
- d) Professional and Technical Communication: communicate effectively with other designers, professionals, and customers.

The assessment of this course is done by the host (industry) supervisor in collaboration with the university academic staff. Upon completion of the course, students are required to write a report on their experiences and submit a diary of activities they undertook during the placement period. Moreover, the industry supervisor is expected to write a confidential report about the student’s performance. All these contribute to 10 credits.



The ratio of the diary, student report, and supervisor and university staff assessment is 1:2:1. The industry supervisor is given a bigger ratio because he/she will be mentoring the student during the 14 weeks.

## University of Botswana Graduate Attributes

The University of Botswana is in Botswana, which is a landlocked country in southern Africa. The country has a population of about 2.304 million people. Botswana's population is made up of eight major tribal groupings speaking the Setswana language, and other small tribes speak different dialects of Setswana. All in all, there are about 26 tribal groups. The official languages are Setswana and English. Botswana's culture is defined by its language, traditional attire, traditional music and dance, local food, rituals, and other ceremonies such as weddings celebrations. The University of Botswana is the first university to be built in the country and offers different educational programmes. It recruits local and international students. The University strives to offer internationally recognised qualifications to students.

To respond effectively to society's needs and dynamics, the University of Botswana's *Learning and Teaching Policy* (2008) identified a set of relevant generic graduate attributes that should be integrated into the curriculum design and evaluation processes. The attributes represent the skills, knowledge, abilities, values, and qualities that must be developed in students by the end of the study period at the University of Botswana, irrespective of the discipline. All programmes offered at the University of Botswana must encompass the following graduate attributes: information and communication technology knowledge and skills, self-directed, lifelong learning skills, critical and creative thinking skills, problem-solving skills, communication skills, entrepreneurship skills, organisational and teamwork skills, research skills, social responsibility, leadership skills, interpersonal skills, cross-cultural skills, and accountability and ethical standards. Some institutions may focus exclusively on developing technical skills that can enable one to get a job, but soft skills are important to advance one's career.

## Essential Soft Skills

To prepare students well for their careers, they do not only need the rigour of academic education, but also an applied, relevant, and practical curriculum that focuses on the development of key transferable (soft) skills. A comprehensive range of knowledge and skills learned across disciplines best prepares students with a wide breadth of learning opportunities and skills that can be applied to everyday life and for long-term career success (AAC&U 2015). A curriculum should develop soft skills needed by entrepreneurs and employers such as cognitive and meta-cognitive skills (e.g., creative thinking, learning to learn, self-regulation, and critical thinking), social and emotional skills (e.g., self-efficacy, collaboration and empathy), practical and physical skills (e.g., using new information and communication technology devices), and attitudes and values (e.g., trust, respect for diversity, motivation, and virtues) (Cunningham and Villaseñor 2016; OECD 2018; Partnership for 21st Century Skills 2010). Laird and

Garver (2010) argue that soft skills assist students to develop valuable skills, such as integrative thinking, communication, quantitative reasoning, and critical thinking that are crucial for lifelong learning, and they build a foundation of knowledge needed for graduates to be effective citizens in a fast-paced, interconnected world. Soft skills develop a strong sense of self, trust in one's capabilities, and the ability to reflect and learn from one's experiences, and these are the skills employers and entrepreneurs are looking for in the graduates they hire. These skills are needed by students to be successful in their professions and to contribute effectively to a rapidly changing global workforce. Soft skills are personal attributes or character traits and interpersonal skills that enable one to relate effectively and amicably with other people.

The 4th Industrial Revolution (4IR) is creating a demand for wholly new jobs that need new skill sets, and it is displacing existing jobs. The institutions of higher learning need to be at the forefront of the new education transformation and wave of global economic development. The skills that will be required in the future are different and there is a need to continuously review the curriculum to align it with the current and future socio-economic and technological demands. A report on *The Future of Jobs* (World Economic Forum 2020) argues that in preparation for the 4th Industrial Revolution, the skills required in different industries will include the following: analytical thinking and innovation, active learning and learning strategies, complex problem-solving, critical thinking and analysis, creativity, originality and initiative, leadership and social influence, technology use, monitoring and control, technology design and programming, resilience, stress tolerance and flexibility, reasoning, problem-solving and ideation, emotional intelligence, troubleshooting and user experience, service orientation, systems analysis and evaluation, persuasion and negotiation. This requires that universities should come up with innovative strategies on how they can reskill and upskill students to equip them with the skill sets aligned to those of their future jobs. One way of aligning students' skills with their future jobs is through work-integrated learning. Soft skills are better learnt through practice than being taught in a classroom set-up. Therefore, work-integrated learning allows students to gain employability skills and practise soft skills in a real-life work environment.

## Research Method

A case study was conducted at the University of Botswana with 21 fourth-year Bachelor of Design (Industrial Design) students (Table 1). There were only two female students in this class and the rest were males. As part of the students' study programme, this cohort received work-integrated learning for a period of 14-weeks in different design industries as part of fulfilling the programme requirements. This class was chosen because this was their second work-integrated learning experience, and it was anticipated that they would be able to respond effectively to the questionnaire. The aim was to use the results from the study to evaluate the WIL and improve the programme in the future. Such a study was of interest to the Internship Coordinator and members of staff who supervised the WIL.

## Research Design and Participants

A case study was chosen to be used in this study because it is an empirical enquiry that investigates a phenomenon within its real-life context (Yin 2014). The approach allows the researcher to explore individuals or organisations through interventions, relationships, communities or programmes and supports the deconstruction and the subsequent reconstruction of various phenomena (Hans-Gerd 2017; Yin 2014). Close collaboration between the researcher and participants enables the participants to tell their stories (Rashid et al. 2019). It is through these stories that participants can describe their views of reality and this enables the researcher to better understand the participant's actions. When this approach is applied correctly, it becomes a valuable method of research design to develop theories, evaluate programmes and develop interventions because of its flexibility and rigour.

**Table 1:** Participants' profiles

| Participants' Profiles              |                                        |
|-------------------------------------|----------------------------------------|
| Number of participants              | 21                                     |
| Age range                           | 21–24 years                            |
| Male                                | 19                                     |
| Female                              | 2                                      |
| Occupation                          | Students                               |
| Nationality                         | Batswana                               |
| Educational background              | 4th-year undergraduate design students |
| Educational institution and country | University of Botswana, Botswana       |

## Instrument

At the end of the work-integrated learning session, a survey was administered to students who had just completed it. The questionnaire was composed of three open-ended and 28 closed-ended questions. Of the 21 students enrolled in the course, all of them completed the survey, representing a response rate of 100%. All the closed-ended questions were completed by the students. However, a few students did not fill in some of the open-ended questions. In the closed-ended questions, students were asked to rate the level at which they perceived to have attained work-integrated learning-related graduate attributes. Students rated the perceived level of attainment of the graduate attributes as outlined in the *Learning and Teaching Policy* of the University of Botswana (2008) against a five-point scale. A score of 1 represented poor attainment; 2 represented satisfactory attainment; 3 represented good attainment; 4 represented very good attainment and 5 represented excellent attainment. Moreover, students reflected on some open-ended questions on what they liked about the work-integrated learning experience, explained why they rated some graduate attributes 2 or below and outlined what aspects can be improved in the future to enhance the work-integrated learning experience.

## Data Analysis

All quantitative items were analysed using SPSS version 28 software. The data analysis of the students' perceptions of attained graduate attributes was done by calculating the mean scores on the attitude scale. To achieve this, numerical scores were assigned to five response options given to each item on the attitude scale. The data was then entered into the SPSS data editor for analysis. The main aim was to find out how the participants of the study (students) and the variables of the study (questions on graduate attributes) are related to each other. The data on the perceived attainment of graduate attributes were analysed by using frequencies, means and percentages. The overall quantitative data were presented in terms of tables, graphs, and text.

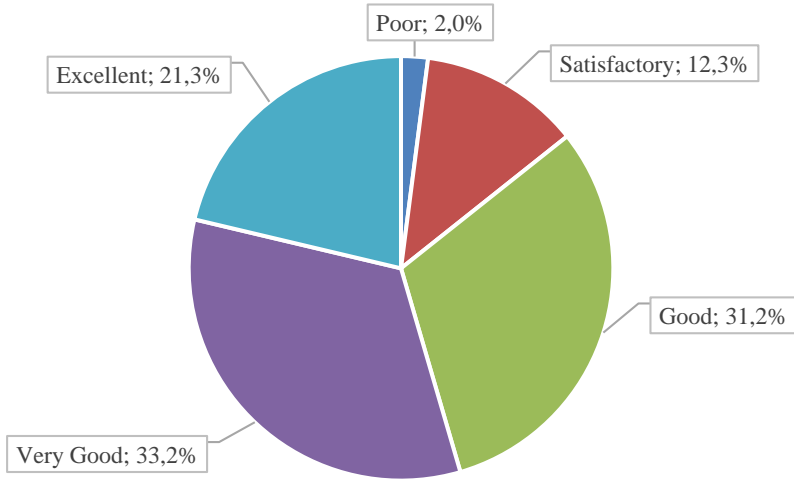
The qualitative data was analysed using content analysis. The data were coded and analysed using Atlas.ti software and reported in emergent themes from the data. The development of the coding system involved naming and grouping data into themes. That is, the frequency of similar responses per question and between questions were grouped to form a theme. This resulted in the following themes: "good work-integrated learning experiences," "perceived application of soft skills," "negatives aspects of WIL" and "suggestions to improve work-integrated learning." The procedure for data analysis comprised three steps: (1) aggregation of the coder's ratings, (2) totalling the overall counts of each coded theme, and (3) the analysis of each theme. The coding of data entailed assigning distinctive labels to text passages such as a word, phrase or sentence that contains references to specific themes of information.

## Ethics

The ethical clearance for this study was given by the University of Botswana Ethics Review Board. Each of the 21 participants was invited to participate voluntarily in the study. Each participant was given the ethics approved information letter and asked to voluntarily complete a consent form if they were interested in participating in the study. Participants were free to participate in the study or to withdraw from the study at any time if they so wished. All participants consented to participate in the study. Participants who completed the questionnaire were anonymous to protect their identity and confidentiality.

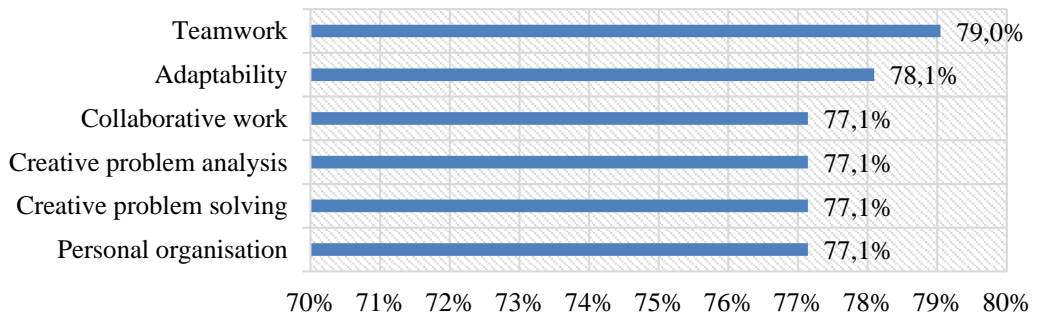
## Results

On the overall perceived attainment of graduate attributes by the participants during the work-integrated learning period, the results show that 2% of the respondents rated the attainment of the graduate attributes as poor, and 12.3% rated them as satisfactory; 31.2% rated them as good, while 54.5.2% either rated the graduate attributes as very good or excellent (Figure 2).



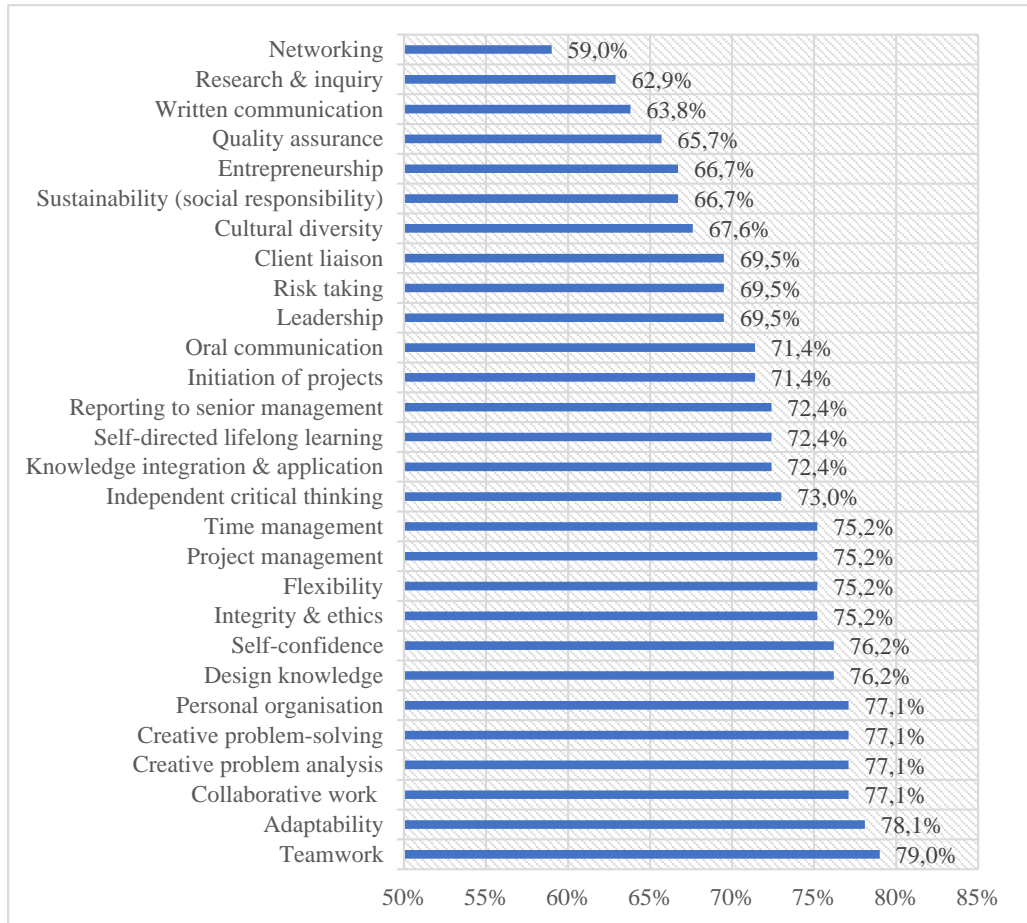
**Figure 2:** Overall perceived attainment of graduate attributes

After undertaking WIL, all the participants perceived that they had attained graduate attributes. The top six graduate attributes that were perceived to have been attained by participants were teamwork (79%), adaptability (78%), lifelong collaborative work (77%), creative problem analysis (77%), creative problem solving (77%), and personal organisation (77%) (Figure 3).



**Figure 3:** Top six attributes perceived to have been attained during WIL

Figure 4 shows the overall perceived attainment of 28 graduate attributes whose scores ranged from 59% to 79%.



**Figure 4:** Overall perceived attainment of graduate attributes

The highest rated graduate attributes were teamwork (79%) and adaptability (78%). From Table 2, we can see that 76% of the participants rated the attainment of the teamwork attribute as either “very good” or “excellent.” The findings show that the following skills were rated very low by the participants: networking (59%), research and inquiry (62.9%), written communication (63.8), quality assurance (65.7%) and sustainability (66.7%). The open-ended questionnaire required participants to state why they scored some graduate attributes low. For example, with regard to networking, one would expect that students would have built a good network that will assist their future career advancement. The participants stated that some of the co-workers lacked interpersonal skills and empathy, and it was difficult to communicate and network with them. In support of the latter, these participants echoed that “some workers were not interested in networking with students and [...] it was difficult to reach out to them” (Participant 11; 15; 17; 20). Research and inquiry (62.9%) were scored low because students were involved in the firms’ production activities. The research section was either inactive or there were legal and ethical issues regarding the company’s intellectual

property, which was known by a select few in the company and this could not be exposed to students.

Some graduate attributes were scored average, e.g., leadership (69.5%), risk-taking (69.5%), and client liaison (69.5%), because students worked under an industry supervisor as assistants rather than taking a leading role. Cultural diversity (67.6%) deals with students' ability to work, accept, and respect different cultures in the workplace. This is significant because workplaces have a variety of different cultures and ethnic groups. A deep understanding of cultural diversity enables students to learn, collaborate and cooperate with fellow workers. All in all, the results show that participants perceived themselves to have attained the graduate attributes as they were all scored above average.

**Table 2:** Teamwork

|       |              | Frequency | Per cent | Valid Per cent | Cumulative % |
|-------|--------------|-----------|----------|----------------|--------------|
| Valid | Poor         | 1         | 4.8      | 4.8            | 4.8          |
|       | Satisfactory | 2         | 9.5      | 9.5            | 14.3         |
|       | Good         | 2         | 9.5      | 9.5            | 23.8         |
|       | Very Good    | 8         | 38.1     | 38.1           | 61.9         |
|       | Excellent    | 8         | 38.1     | 38.1           | 100.0        |
|       | Total        | 21        | 100.0    | 100.0          |              |

After the participants rated the perceived attainment of the graduate attributes, they were asked to respond qualitatively to three aspects. The first aspect asked participants to reflect on what they liked about the work-integrated learning experience. Six participants indicated that they appreciated being able to design and manufacture products. In this regard, they mentioned the following:

Thrilled by the fact that I was designing and manufacturing at the same time ...  
(Participant 6)

We designed and manufactured products which are still in use today. (Participant 7)

A chance to work on both design and manufacturing ... (Participant 9)

We gained more manufacturing skills and designing. (Participant 14)

It gave me a good exposure on the design, manufacturing ... (Participant 16)

Manufacturing of products. (Participant 17)

Furthermore, eight participants liked the interaction with or designing for real clients (although this interaction was limited), as well as the exposure to a real work environment. They expressed this by stating the following:

We were designing products for clients ... [and] gained a lot of experience designing real products for real people. (Participant 7)

Dealing with a client at the company ... (Participant 12)

Design for clients ... (Participant 8)

The sense of reality and made me think of opportunities after school. (Participant 3)  
Exposure to real environment ... (Participant 4).  
Exposed me to the lifestyle of the work experience ... (Participant 10)  
It gave me a glimpse of what we will be doing after graduation. (Participant 18)  
It gave us a glimpse of the design industry in our country ... what to expect after graduation. (Participant 21)

Lastly, the participants also liked that they were able to apply what they learnt at the university and further enhance their skills. They expressed this by saying:

Got a chance to apply the skills that I have been learning in my programme. (Participant 2)  
Apply skills learnt in school, by allowing for practical application of the theory learnt. (Participant 5)  
Got to apply the design knowledge I had in the real world or industry. (Participant 11)  
... being able to make a CAD model before manufacturing. (Participant 8)  
... exposed me to detailed CAD technology. (Participant 9)  
We were introduced to certain aspects of CAD software that we did not do in class. (Participant 13)  
Use of software of which we did not know ... (Participant 19)

The following areas need to be improved in future as per the participants' recommendations. Since the design and manufacturing industry in Botswana is still in its infancy, it is not always possible to have students placed within ideal firms for work-integrated learning. One respondent captured this by saying: "We should be assigned to companies that have an established design practice, we can learn from [...] not just any willing company" (Participant 13). The same was echoed by a few other participants, who said:

Attach students only to up-to-standard industries where students would gain experience. (Participant 17)  
We should be taken to places that do what we are taught or related to design. (Participant 19)

Other suggestions for improvements as expressed by participants included the following:

- a) Increase the duration of the internship;
- b) A desire to have greater interaction with clients;
- c) Increase the frequency and regularity of university supervisor visits;
- d) Sensitise companies on the role of industrial design students during the internship to maximise utility within the company.



A reflection by students on the previous point (d) above revealed that some companies did not know how to fully utilise industrial design students and at times gave them mediocre tasks such as cleaning. To resolve this challenge, participants suggested that they be allowed to select companies of their choice that are aligned to their career needs as opposed to being placed by the university authorities.

## Discussion

The findings indicate that the top six graduate attributes perceived to have been attained by participants are teamwork, adaptability, collaborative work, creative problem analysis, creative problem solving, and personal organisation. For example, teamwork was highly rated because, in the industrial design profession, any work done demands people working in teams. Teamwork as a skill is associated with other skills such as communication, because it is the foundation of effective teamwork, problem solving, time management, listening, collaboration, critical thinking, and leadership.

The results show that the students perceived themselves to have attained graduate attributes because all the graduate attributes were scored above average. This shows that the participants learnt the graduate attributes through working in an authentic work environment solving real-life challenges. The participants expressed the same in qualitative responses; e.g., they like learning manufacturing processes that may have been learnt theoretically at the university, thus connecting theory and practice, and dealing with clients in product development. Perhaps this indicates the importance of WIL in developing students' skills for future jobs. The results of the study are aligned to the outcomes of a model of work experience for work-integrated learning developed by Rowe (2017) that has the following secondary outcomes: career development, improved job performance, improved academic performance and job offers.

However, the following graduate attributes were rated low: networking, research and inquiry, written communication, quality assurance and sustainability. Some of these attributes that were highly rated are aligned to a study conducted by the World Economic Forum (2020) as essential skills needed for the 4th Industrial Revolution. The low rated graduates' attributes do not feature in the essential skills needed for the 4IR. The World Economic Forum (2020) study asked business leaders—chief executives, chief strategy officers and chief human resources officers—what skills they plan to prioritise when they recruit new graduates by 2025. The report also provides in-depth information on 15 industry sectors in 26 Global South and Global North countries. The top 10 attributes employers were looking for were the following: complex problem solving, critical thinking, creativity, people management, coordinating with others, emotional intelligence, judgement and decision making, service orientation, negotiation and cognitive flexibility (World Economic Forum 2020).

In this study and the World Economic Forum report (2020), emphasis has been placed on complex problem solving, critical thinking and creativity. This shows that employers are keen to recruit graduates who can analyse and solve complex problems creatively.

In other words, employers are looking for graduates with enthusiasm who can influence the direction and nature of discussions, contribute original ideas, analyse problems well, and who are open-minded. The more cognitively diverse (in terms of knowledge, processes, and perspectives) a team is, the more likely it is that the team will creatively and productively solve new, uncertain and complex situations (Reynolds and Lewis 2017).

Moreover, the work environment is changing at a rapid pace due to the 4IR and employers actively seek graduates who can adapt to changing circumstances and environments, who embrace new ideas, are enterprising, resourceful, and adaptable. Adaptability was highly rated by students in this study because it is a critical quality that employers seek in graduates due to rapid changes in technology, diversity, and society. Employers need graduates who are open to new ideas, good at multitasking, flexible enough to work through challenging issues, and who can cope when things do not go as planned. The participants expressed that at their workplaces, they were exposed to situations that demanded their willingness to learn new methods, procedures, or techniques and take on new tasks. This explains why attributes such as adaptability and teamwork were highly rated by the participants. Joksimovic et al. (2020) concur that teamwork is crucial in developing the skills necessary for successful collaboration, cooperation, and project management. WIL is effective in developing employability skills targeted to a specific career path in a competitive employment environment. It is authentic and assists students to experience real work in a real environment that encompasses real challenges.

### **Limitations of the Study**

The sample size of the study was small due to the class size that was used. The study needs to be conducted over time (years) observing different groups of students to allow the researchers to generalise the findings of the study. Therefore, the results and lessons learned from the study may not be transferable to other settings. Moreover, the study was based on the perceived level of attainment of graduate attributes as reported by the students. The study lacks input from the industry where students were attached. This can give a balanced report. In future, industry feedback shall be taken on board.

### **Conclusion**

Even though the results lack input from employers, they show that work-integrated learning is one of the effective methods of teaching graduate attributes that are needed by the employers. This helps to avoid a mismatch of skills between what academia produces and expectations from the job market. This also helps companies not to spend money on reskilling and upskilling new graduates as they join the job market. Universal soft skills are needed by all employers, irrespective of the candidates' study programme. Graduate attributes improve graduate opportunities for employability. The literature has shown that employers are looking for a graduate's ability to show value in the workplace beyond the job description. It is the tangible skills or core competencies that get one in

the door, but the soft skills often get one a job. The expectations from the employers are that graduates should possess technical and discipline-specific competencies from their programmes of study, but they also require graduates who can demonstrate a range of broader skills and attributes. Therefore, the study programmes in institutions of higher learning need to emphasise global experience, thus aligning teaching and learning to future job skills and work readiness skills and competencies.

There have been calls, especially in Botswana, for institutions of higher learning to address the disconnect between what universities teach and the expectations of employers. However, there have been very few studies conducted in design-related programmes from an African perspective on how this gap can be closed. This study attempted to demonstrate that the integration and attainment of graduate attributes in the curriculum can be one possible avenue to address the mismatch between skills students acquire at universities and employers' expectations. The integration and attainment of graduate attributes ensure that graduates acquire additional knowledge and skills that match society's and employers' present and future needs. All in all, work-integrated learning has triple helix benefits: students become employable and develop lifelong learning capabilities; the industry benefits from a skilled workforce and contributes to the professional development of this workforce, and universities' reputation improves due to producing quality employable graduates and innovative entrepreneurs.

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