

Work-integrated learning placement in engineering education: a comparative contextual analysis of public universities in Malawi, Namibia and South Africa

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Abstract

Purpose – The study compares how work-integrated learning (WIL) placement positioning, duration, assessment strategies and environment at three Southern African universities influence engineering students' academic and employability outcomes.

Design/methodology/approach – The study used a qualitative case study approach that drew on the principles of collaborative autoethnography (CAE). The researchers reflected on WIL placement practices, structure, assessment, environment and outcomes at their universities and then analysed the reflections using comparative descriptive techniques.

Findings – The study reports no uniformity among the universities in positioning WIL placement in the curriculum. It is done during end-of-year vacations, between the penultimate and final year or in the last year. The study found WIL placement positioning does not influence academic outcomes; however, the influence on employability outcomes needs further investigation. Components of WIL placement assessment are similar, presentations, logbooks and reports. However, there are differences in the weightings of the various assessment components and the contribution of the industry supervisor. There is a growing trend towards placing students within universities to mitigate the challenges of limited opportunities of placements available in the industry. The impact of this also needs to be further investigated. Lastly, there are policy-related challenges in placing international students. Work restrictions on student visas limit international students' access to WIL placement. Southern African universities need to lobby the waivers to student visa restrictions that limit their participation in WIL programs if there are to succeed in their internationalisation efforts.

Originality/value – The study highlights the gaps in understanding Southern African universities' WIL placement practices, particularly relating to the positioning of WIL placement in the curriculum, the assessment methods used and the theory to work integration and employability outcomes.

Keywords Work-integrated learning, WIL placement, Comparative analysis, Engineering students, Employability, Southern Africa

Paper type Research paper



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1. Introduction

The International Labour Organisation (ILO) declared youth unemployment a global crisis in 2012, warning that it posed a significant threat to society (ILO, 2012a). This issue is particularly acute among disadvantaged youth and in Africa, where the North and Southern African sub-regions have 33 and 24% unemployment rates, respectively (ILO, 2012b). Underemployment and poor working conditions compound the problem, and the ILO has called on countries, including those in Africa, to implement targeted policy interventions to tackle the issue. One such intervention is work-integrated learning (WIL) which enables students to acquire knowledge and skills through practical experience and reflection in an actual or simulated work environment or through some work-related practice (ILO, 2018; Fergusson and van der Laan, 2021). The term WIL encompasses several pedagogical practices that provide students with practical experience as part of the curriculum (Jackson and Dean, 2023). It includes workplace-based practices such as work placement, cooperative education, practicum and industry-based projects. It also includes university-based practices such as simulated work placement and project-based and problem-based learning. In this article, the discussion centres on WIL in the form of work placements or simulated work placements; thus, the term WIL placement will be used throughout the article (Aprile and Knight, 2020; Paull *et al.*, 2019).

Regarding combining work and learning, WIL placement is similar to workplace-based learning (WPBL), albeit with different target audiences. The distinction between WIL placement and WPBL is the target audience. WIL is a pedagogical approach aimed at students, whereas WPBL is designed for employees. WPBL can be structured or informal (Kis, 2016). Structured WPBL typically lasts for a fixed period and results in a formal qualification, such as a trade test certificate. It encompasses practices like apprenticeships, traineeships and cadetships. Informal WPBL, on the other hand, does not lead to a formal certification or qualification and includes practices like internships that take place outside formal education and informal apprenticeships that lack a contract between the apprentice and the master craftsman.

WIL placement is an effective strategy for improving graduates' employability. Studies have found that participating in WIL placements can positively impact the time taken to secure employment and the quality of employment obtained. The quality of employment compares a graduate's qualification and the job level obtained. For example, a Bachelor of Engineering graduate getting an artisan-level job is appropriate employment. It is underemployment. An ILO study of 335 million youths found that placement students transitioned to employment in just 1.9 months, compared to non-placement students, who took an average of 20.1 months. In sub-Saharan Africa, the difference was even more striking, with placement students taking just 0.3 months to transition to employment, compared to non-placement students who took an average of 28.5 months (ILO, 2018). However, a study in the United Kingdom produced contradictory findings, with no statistically significant difference in employment outcomes between 777 placement students and 698 non-placement students, but statistically significant differences in the quality of employment obtained (Brooks and Youngson, 2016). Another study in South Africa found that 50% of employers who participated in work placements hired the students they hosted, and 92% indicated they would hire a placement student if needed (Jacobs, 2015).

WIL placement has been a part of engineering education for a long time. The first formal WIL placement program, a cooperative education program, was introduced at the University of Cincinnati in 1906 by Herman Schneider, the dean of the College of Engineering (Niehaus, 2005). Schneider noticed that students with work experience understood engineering concepts better and more quickly than those without experience. They also performed much better in their work, to the point that Cincinnati Milling Machine Company once hired an entire mechanical engineering class (Niehaus, 2005). However, the use of WIL placement as a

pedagogical strategy declined, particularly in engineering science programs. Since the 1990s, there has been a resurgence of WIL placement in engineering science and technology programs, driven by the demand from industry and professional bodies for engineering graduates who are work ready. As a result, some universities have introduced mandatory WIL placement in their engineering programs. For instance, some French universities have even designed vocational bachelor's degrees that include 12- to 16-week WIL placement (Giret *et al.*, 2011). Similarly, Engineers Australia, the Australian engineering program accreditation body, mandates at least 12 weeks of WIL placement for all engineering students (Paull *et al.*, 2019).

This article examines WIL placement in engineering programs at three universities in Southern Africa: Malawi University of Science and Technology (MUST) in Malawi, Namibia University of Science and Technology (NUST) in Namibia and Cape Peninsula University of Technology (CPUT) in South Africa. The article recognises that contextual factors can influence WIL placement structure and employment outcomes. Employment outcomes refer to combination of factors, including work readiness, time to secure employment and the quality of the employment. The WIL placement structure can impact employment outcomes. The study aims to compare the WIL placement structure at the three universities and identify opportunities and challenges associated with each approach. The article describes each university's WIL placement practices, structure, assessment, environment and outcomes. It reflects on these practices in light of three research questions:

- RQ1.* How are engineering students placed, monitored and assessed at MUST, NUST and CPUT?
- RQ2.* What opportunities, challenges and outcomes are associated with WIL placement at each university?
- RQ3.* How do the WIL placement practices of the three universities compare?

2. Methodology and methods

This study used a qualitative case study approach as it is appropriate for investigating current issues within their natural setting (Patton, 2015; Yin, 2018). This approach is advantageous when the distinction between an issue and its context is not immediately apparent. In this study, the issue is work placement at three Southern African universities. The study received ethical approval from CPUT Research Ethics Committee (2021 FEBEREC-ST10). It also received data collection permissions from MUST and NUST.

2.1 Background and context

The three universities are in countries that are members of the Southern African Development Community (SADC) but with different social, economic and geographic contexts (Adejumobi and Obi, 2020). Malawi is primarily rural with low industrialisation. Malawi has limited WIL placement opportunities because of its low industrialisation. Namibia and South Africa have highly modern industries. With its larger industrial sector, South Africa offers more WIL opportunities than Malawi and Namibia. However, South Africa has significantly more engineering students requiring placement. Geographically, South Africa and Namibia's coastlines offer marine engineering opportunities, unavailable in Malawi, influencing the types of industries in which students can perform work placements.

The CPUT is located in Cape Town, South Africa. It is a large university with more than 30,000 students. Its Faculty of Engineering and the Built Environment is the second largest at the university, enrolling approximately 7,000 students as of 2022. The faculty has eight

departments that offer 68 undergraduate and 15 postgraduate qualifications in engineering and the built environment.

The MUST is located in Thyolo, approximately 35 km from Blantyre, a commercial city in Malawi. The university has four schools, and the Engineering Department is part of one of these schools, the Malawi Institute of Technology (MIT). The Engineering Department offers six undergraduate programmes and two postgraduate degrees. It had approximately 664 undergraduate engineering students.

NUST's main campus is in Windhoek, Namibia. It has an average enrolment of 11,000. The Faculty of Engineering and Built Environment has more than 120 academic staff members. It has two schools comprising four academic departments that offer 24 undergraduate programmes and 22 postgraduate programmes. The faculty has four research institutes and offers a bridging programme (InSTEM).

2.2 Sampling

The authors conveniently selected three public universities in Southern Africa. They are affiliated with the engineering faculties of these universities. Their contextual knowledge provided a deep understanding of the practices and issues and facilitated a close analysis of the individual cases.

2.3 Data collection and analysis

The data collection and analysis followed the principles of collaborative autoethnography (CAE). CAE combines the elements of autoethnography (an approach in which the researcher reflects on their personal experiences) and collaborative research (an approach in which the researcher collaborates with others to collect and analyse their data). CAE involves multiple collaborators reflecting on their experiences and producing a collective narrative exploring a shared topic or issue (Chang *et al.*, 2013).

The researchers employed a CAE process that followed the recommendations of Chang (2008), Ellis and Bochner (2006) and Reed-Danahay (1997). First, they had a general discussion on work placement practices and their universities. Next, each researcher reflected on their experiences and insights into work placements at their university. These reflections were typed and shared among the researchers. The group met again to discuss its experiences and reflections. The researchers conducted group discussions on WIL placement practices, opportunities and challenges at their respective universities, which were audio-recorded for analysis. Audio recordings of the two group discussions were transcribed and imported to NVivo for further analysis. The reflections of the individual researchers were also imported into NVivo. The analysis followed a descriptive comparative approach, focusing on individualising each university's work placement practices to better understand its peculiarities (Pickvance, 2001; Thomann and Maggetti, 2020). One researcher conducted the analysis and shared the findings with the other two researchers. The two researchers checked the coding and the resulting themes and made appropriate changes. A shared folder and document facilitated real-time collaborative work on these findings. The revisions were iterative until all the researchers were satisfied that the findings reflected the university contexts and their reflections.

3. Findings

This section presents the findings of the three cases that are the focus of this study. The findings outline and compare the universities' WIL placement practices, structure, assessment, environment and outcomes.

3.1 Case one: WIL placement at Cape Peninsula University of Technology

At CPUT, WIL is compulsory for the Diploma in Engineering (DipEng) programmes. Engineering Council of South Africa (ECSA), the accreditation body of engineering programmes in South Africa, also accepts project-based learning, problem-based learning, simulated WIL placement and work-directed theoretical learning as meeting its requirements for WIL (ECSA, 2020). CPUT prefers to implement WIL in the form of WIL placement, which currently accounts for 60 of the 360 credits of the DipEng (CPUT, 2022). ECSA requires WIL to account for 30 credits of the 360-credit DipEng (ECSA, 2020). In terms of duration, the DipEng students go for a six-month-long WIL placement during the second semester of the final year.

The university is responsible for placing students. To do this, CPUT has WIL Coordinators in each engineering department. The WIL coordinators look for hosting companies for the students. If a student finds their own hosting company, the WIL Coordinator reviews, which sometimes involves visiting the company, and if they consider it suitable, the student will be placed there. The process is the same if a company requests the placement of students. If students are not placed in an external company, there are sometimes placed in the department's workshops or community projects that the university runs. The WIL component is treated like any other compulsory module, so students must pass WIL placement to graduate.

In terms of assessment, there are a hosting company-based assessment and a university-based assessment. Each placement student is visited twice. The first visit is to check how the student has settled in. For the second visit, the student is required to make an oral presentation to the WIL Coordinators, his industry mentor and other hosting company employees. The coordinator and the industry mentor collaboratively grade this assessment. During the placement, the students are encouraged to complete the logbooks weekly. The industry mentors comment on what the student has entered in their logbooks. They then sign off on that entry if they agree on its correctness as a true reflection of the student's work. For their final assessment, the industry mentor grades the student using a standard rubric and submits the marked rubric to the WIL Coordinator. Finally, the student writes a report and presents it with their logbook to the WIL Coordinator for assessment. The WIL Coordinator then combines the three marks to get a student's final mark for the WIL placement component.

CPUT experiences several challenges relating to using WIL placement. First, government policy assigns the responsibility of placing students on universities that mandate WIL placement (CHE, 2011). This burden has substantially reduced the number of South African universities offering the DipEng. Some universities that used to provide engineering diplomas have stopped and are now offering the BEngTech, which does not have a WIL component. Others offer a 240-credit DipEngTech, which does not have a WIL component. In the long run, this will reduce the number of technicians that universities produce. For universities of technology, this represents academic offerings and mandate drifts because these universities were supposed to offer vocational degrees.

The second challenge relates to the scarcity of WIL placement opportunities. Fewer and fewer companies are willing to host engineering students. This is because some engineering companies have closed due to the prevailing economic conditions exacerbated by the COVID-19 pandemic.

The third challenge relates to international students. Most hosting companies are unwilling to host international students. This is because of the legal and policy environment that minimises the benefits accrue to those who host international students. First, most study permits do not allow international students to work a 40-h week. Second, The Sector Education and Training Authorities (SETAs) do not reimburse hosting companies for the

stipends they pay international students. However, SETAs refund the cost that hosting companies incur to host local students.

The most significant opportunity for those universities that offer WIL placement is that because others are no longer offering it, it will become easier to place students. Also, the students will find it easier to secure full-time employment as there will be less competition for technician-level jobs.

3.2 Case two: WIL placement at Malawi University of Science and Technology

WIL placement at MUST, being practised by the engineering department, is designed to complement the academic study work with real-life industry work life. The university developed a WIL policy that dictates how WIL placement is supposed to be handled (MUST, 2018). For the engineering department, in all five academic programmes (the sixth programme has just started, as such, there are students that have gone out to WIL placement), students are sent out for an entire semester (about 16–18 weeks) to acquire hands-on practical experience in the fourth year of their study. This activity is designed to take place in the second semester of the fourth year and happens once in their school life. After finishing their industrial work, they return to the institution to complete their last two semesters in their fifth and final year. The arrangement is that the industry will provide a mentor, and at the same time, there will be a supervisor from the university. During their stay, they are supposed to note the daily activities in the logbook, which are later submitted together with a report for grading.

The current practice is that all attachment places are negotiated by faculty members from all five sections who physically visit the industry to discuss placement-related issues. Each company is asked to indicate the number of students they are willing to take. Once this visit is done, consolidation takes place to allocate students to various companies. Under the current WIL placement policy, the university's part is to provide a monthly stipend to every student for their stay. The host companies are not obligated to provide students with monetary incentives. However, if they are willing to offer compensation to the student, they are free and encouraged to do so. During this period, the students also register with the university and pay the total tuition fees.

Nevertheless, students can also find their own places to attend this WIL placement activity, which is acceptable. Sometimes, the industry can also make arrangements that when the time comes for the students to attend WIL placement, they go straight to them based on their preference.

Once students have gone out, a visit is scheduled by the department to assess how the students are settling down and also to understand if there are any problems or challenges they are facing. Then a second visit gets arranged where students are assessed. They are given a chance to present what they have been doing to the visiting supervisors and the industry mentor, and they are graded on this.

The final assessment comes from the logbook, the individual WIL report, the industrial presentations and the industrial supervisor. The marks distribution is as follows: 30% comes from the industrial supervisor's report, 20% comes from the academic supervisor's assessment, 15% comes from the logbook and 35% comes from the WIL placement reports and the presentations. WIL placement is taken as a module, and the passing mark is pegged at 50%.

The major challenge during will placement is finding spaces for all students with the limited number of willing companies to take students on board. The progressive increase in enrolment is compounding this problem and will continue until the number of companies grows. To overcome the challenge of finding spaces for the students, the university has, over the years, struck some deals with companies to take the students when WIL placement times come.

The arrangements are cemented in the form of a signed memorandum of understanding so that the companies commit to how many students they can accommodate whenever the need arises.

The opportunities could be seen in terms of the possible industrial problems identifications and solution generation that can and are being done by the students. The spinoffs could be that there are possibilities for research collaborations from these arrangements.

3.3 Case three: WIL placement at Namibia University of Science and Technology

At NUST, WIL placement is compulsory for programmes in the Faculty of Engineering and Built Environment (NUST, 2021). It is a precondition for graduation. WIL allows students to get first-hand experience with industrial practice and enable them to apply their acquired knowledge in the industry. WIL placement is part of the teaching and learning strategies for the university.

The placement of students is a primary function of each department, although students can find their own placements. The university also has a cooperative education unit which helps coordinate WIL placement activities university-wide. Students who fail to get placements are usually accommodated in the various laboratories within the faculty where they perform WIL placement as project assistants to academic supervisor projects. Each department has a WIL coordinator who coordinates WIL placement activities, including student visitation, to check their progress. The students are required to record all activities carried out in industry in the form of a logbook which the industrial and academic supervisors oversee. The WIL placement component assessments are in the form of a technical report produced by the student at the end of the WIL placement period. The industrial and academic supervisor marks the technical report. The mark from the academic examiner contributes 90% to the final mark, whilst the remainder is from the mark allocated by the industrial examiner or to the projects the departments undertake.

The industry in Namibia fully supports the WIL placement, as many students get placements. However, international students face statutory and regulatory hurdles, which result in many sectors shunning taking them on board. The WIL placement component has no credit weight for the final degree classification and often does not appear in the timetable. Therefore, various departments have developed methods to assist students in WIL placement. For example, some departments provide block classes in the last semester to allow students to complete courses early and depart for WIL placement. In contrast, other departments encourage students to engage in WIL placement activities during vacations or at the end of the semester from December to March.

Though the WIL placement duration is at least six weeks for grading purposes, the fact that it can be done at the end of the last semester allows opportunities for the students to be employed by industries. WIL placement is essential for students to gain practical experience; therefore, obtaining practices allowed WIL placement within NUST should be strengthened. The industrial board, which links the various departments and respective industries, should develop placement modalities to help the students be easily placed. The international relations department should actively engage the government and enterprises to have a waiver for international students to get placement for WIL placement within the Namibian industry without much regulatory hassle. Finally, the WIL placement component should have credits that affect the final degree of classification.

3.4 Comparison of the three cases

Table 1 compares the three universities' WIL placement practices, structures, assessments, environments and outcomes. In the table, (1) indicates an attribute's presence at the

Table 1.
Comparison of WIL
placement in
engineering faculties at
MUST, NUST
and CPUT

	MUST	NUST	CPUT
• <i>WIL placement practices</i>			
University places students	1	1	1
Self or company-initiated placements allowed	1	1	1
Students can be placed within the university	1	1	1
University pays student stipend	1	0	0
Dedicated university WIL Coordinators	0	1	1
WIL placement progress monitored	1	1	1
• <i>WIL placement structure</i>			
WIL placement can be at various times	0	1	0
Compulsory WIL placement	1	1	1
Credit-bearing WIL placement	1	0	1
WIL placement in the final year	0	1	1
WIL placement needed for graduation	1	1	1
WIL placement sandwiched the final and penultimate	1	0	0
WIL placement is a semester-long	1	0	1
• <i>WIL placement assessment</i>			
Academic supervisor contributes more to the final mark	0	1	1
Final report submitted	1	1	1
Joint grading with industry partner	1	1	1
WIL Coordinator grades final report	1	0	1
Student completes logbooks	1	1	1
• <i>WIL placement environment</i>			
WIL placement unfriendly policies	0	0	1
International students face challenges with WIL	0	1	1
Limited WIL placement opportunities	1	0	1
Industry accommodating to WIL	0	1	0
• <i>WIL placement outcomes</i>			
Increases employment outcomes	1	1	1
Integration of theory and practice	1	1	1
Industry-relevant projects in the final year	1	0	0
Source(s): Table by authors			

university, whereas (0) indicates its absence. The table shows that most elements and outcomes of the WIL placement were similar for the three universities. Four of the six categories of WIL placement practices were done at all three institutions, whilst only two of the seven elements of WIL placement structure were similar for the three institutions. WIL placement assessment is generally similar with two exceptions, the industry supervisor contributes more to WIL evaluation at MUST than at the other two universities, and the WIL coordinator does not grade the report at NUST. In terms of WIL placement outcomes, Table 1 reflects the uncertainty on whether the WIL placement timing at MUST contributes to employment outcomes. However, it contributed to the university having more industry-relevant projects in the final year. Table 1 shows almost no similarity in the WIL placement environment at the three institutions. Finally, the table suggests that MUST is different in that it pays a stipend to its WIL placement students and does not have dedicated WIL Coordinators.

However, there are notable differences in how the WIL are structured at the three universities. For NUST, WIL placement can be taken during the end-of-year vacations or the final year. For MUST and CPUT, WIL placement is taken at fixed places-sandwiched between the final and penultimate for MUST and the final year for CPUT. WIL placement is semester-long for MUST and CPUT but shorter for NUST, translating to half a semester.

WIL placement practices for the three universities are similar, except that WIL placement is not credit-bearing at NUST. In all three universities, the critical assessments were the logbook and the final report. In addition, all universities involve industry supervisors in the assessment process, to varying degrees. The placement is flexible at three universities, industry and student-initiated placements are allowed. In addition, students are sometimes placed within the universities, at research centres, workshops and in the universities' community service programs. This flexibility is in response to the challenges of placing students in the industry.

The case studies suggest that the environment in Southern Africa is not conducive to WIL placement. A limited number of companies are willing to take WIL placement students. In an environment with increasing student numbers, this strains universities' WIL placement systems. NUST is better positioned in this regard as its industry is willing to accommodate WIL placement students. This situation is especially precarious for international students who face legal hurdles in securing WIL placements. In South Africa, student visa holders can only work 20 h a week, and companies are not refunded the stipends they pay them. There is a provision for the endorsement of the student to enable a longer working week, but the process is long and cumbersome. These restrictions are more stringent for Namibia and Malawi. For Namibia, a student visa holder is not allowed to work, except if they obtained a work permit. For Malawi, a student visa holder is not allowed to undertake paid work except during school holidays. The impact of these challenges is that most companies, particularly small companies, are unable to host international students.

Considering WIL placement outcomes, the case studies show that WIL placement integrates theory and practice regardless of how it is structured and assessed. All three cases demonstrated this integration. There were differences in other outcomes; NUST and CPUT showed that WIL placement increases employment outcomes. On the other hand, MUST showed that the benefits accruing to WIL placement students persist when they return to universities, translating to the students being involved in more industry-relevant projects.

4. Discussion

Engineering education has experienced a global trend towards mandatory WIL placement, largely driven by accreditation requirements. This trend is evident in our three case studies, all of which offer variations of compulsory WIL placements and is also observed in other regions of the world. For example, Engineering Australia mandates a 12-week work placement program, while the French engineering accreditation body requires a minimum of 20 weeks (Paull *et al.*, 2019; Rouvrais *et al.*, 2018). Although some argue that WIL placement should be voluntary rather than compulsory, as it is in the UK, this approach has its challenges. Earlier studies conducted in the UK have revealed a decline in the number of students opting for voluntary placements (Brooks and Youngson, 2016; Little and Harvey, 2007; Lock *et al.*, 2009). However, more recent studies from the UK indicate a reversal of this trend (Atfield *et al.*, 2021), although engineering and technology have experienced only a modest increase (HESA, 2020). Also, recently there has been a shift in the UK towards shorter work placements instead of the traditional year-long work placement opportunities (Atfield *et al.*, 2021). Year-long placements tended to discourage some students from participating. These recent developments in the UK and elsewhere support shorter mandatory WIL placement L programs as with the three Southern African universities.

One critical aspect highlighted in our case studies is the timing of WIL placement in the curriculum. Our cases offer three possibilities: in the final year, sandwiched between the final year and the penultimate year, or spread out throughout the curriculum. The CPUT case provides the first option, which yields tangible employment outcomes. However, students miss out on the opportunity to apply the gains they acquired during WIL placement in their studies.

The opposite is true for the MUST case, where WIL placement is positioned similar to the sandwich degrees offered by UK universities. Research from the UK suggests that WIL placement students achieve better academic outcomes when they return to university, particularly concerning their management of the final year project (Ceschin *et al.*, 2017). Similar advantages were reported for MUST students. The third option, demonstrated in the NUST case, can combine the benefits of the first two choices. If appropriately structured and integrated throughout the curriculum, the NUST version of WIL placement could produce the benefits of all three outcomes observed in this study, such as integrating theory with practice, positive employment outcomes and academic outcomes.

The WIL placement assessment practices at the three universities are consistent with those used in engineering education elsewhere, focusing on oral presentations, logbooks and final reports (Little, 2000; Redzuwan *et al.*, 2022). However, the WIL placement assessment at NUST is not typical, as it is not credit-bearing and the outcome is classified as “complete” or “not complete.” When comparing this method to MUST and CPUT, it seems that the WIL placement outcomes are unaffected. A significant portion of the assessment concentrates on evaluating student performance. Therefore, it is unsurprising that the industry supervisor participates in these aspects of student assessments. The industry supervisor’s involvement decreases for the final report. This could be because universities consider the industry supervisor’s role more suitable for evaluating student performance than grading academically-inclined reports. The final report is usually more academically focused. Some studies have reported that the industry supervisor’s involvement in assessments is problematic because they tend to be more lenient and give students high grades (Jackson, 2018).

There are severe economic, policy and legal barriers to WIL placement in Southern Africa. First, there is negative business environment that struggles to accommodate WIL placement students. Each year, the number of companies each year that can accommodate WIL placement students keeps decreasing. For instance, South Africa reported a year-on-year increase in business liquidations of 44.8% August 2022 (Stats SA, 2022). This number has significantly decreased since then to 1.3% in February 2023, still indicative of a struggling economy (Stats SA, 2023). This reduction in companies that would provide WIL placement opportunities is occurring while the number of students is increasing.

Second, the legal climate is not conducive, especially for international students. It is worth mentioning that the difficulty of placing international students is not restricted to Southern Africa (Barton and Hartwig, 2017; Goodwin and Mbah, 2019; Jackson, 2017). This is unsurprising because governments usually adopt protectionist policies during economic instability.

Lastly, there are policy challenges surrounding WIL placement. Namibia and Malawi do not have national policies related to WIL placement; each university defines how to implement WIL placement (Matsimbe, 2020; UNESCO, 2016). For example, the engineering faculties of MUST and Malawi University of Business and Applied Science (MUBAS) implement WIL placement differently. MUBAS students undergo a mandatory three-month placement before graduation. This differs from the MUST version of WIL placement, which occurs in the penultimate year.

On the other hand, South Africa has a national policy that promotes WIL (DHET, 2013, 2014). However, the challenge is that this policy places formal responsibility on universities to place all students in programs that mandate WIL placement. As a result, South African universities of technology have tended to shift towards qualifications that do not mandate WIL placement or towards other WIL modalities that are university-based. It remains to be seen whether this strategy effectively produces employable graduates. It is widely acknowledged that WIL placement enhances students’ employability.

5. Implications and recommendations

This study has several implications for WIL placement and policies in engineering education in Southern Africa and other developing regions. Efficacious WIL placement programs need government support by incentivising local companies to participate in WIL placement programs by reducing legal barriers that hinder WIL placements. This support includes establishing legal mechanisms that facilitate the participation of international students in WIL placement programs. If left unresolved, the challenges faced by international students would constrain the internationalisation effects of universities in Southern Africa. Second, the study suggests no timing for WIL placement in the curriculum that brings out all its outcomes. Thus, Southern African universities should consider offering students flexible options for WIL placement. To maximise the benefits of WIL placement, they would integrate it throughout the curriculum while retaining the last placement for the final year. Third, this study suggests that the involvement of industry supervisors in WIL assessments is limited. Universities must involve industry supervisors more closely in assessing WIL placement outcomes, particularly student performance. Finally, the study highlights the importance of WIL placement in enhancing students' employability. There is a growing tendency towards internal WIL placement within the universities' structures or to shift to other modalities of WIL to mitigate the problem of limited WIL placement opportunities in the industry. In that case, there is a need for further research on whether the internal WIL placements of the shift to other WIL modalities offer the same employability outcomes as external WIL placement in the industry.

6. Conclusion

A comparative analysis of WIL placement at the three institutions showed considerable overlap in their practices and challenges. WIL placement practices had the highest commonality (commonality here refers to a phenomenon occurring at all three universities.), followed by WIL placement assessment and environment. WIL placement is compulsory at all the three universities, and they all face challenges in placing a growing number of students. Although WIL placement is a noble practice, the respective countries' regulations may become hurdles in implementing WIL placement. The WIL outcomes were similar, suggesting that WIL integrates theory and practice regardless of how it is structured and assessed. All three cases demonstrated this integration. There were differences in employability outcomes; two cases showed that WIL placement increases employment outcomes. The other case showed that the educational benefits accruing to WIL placement students persist when they return to universities, translating to the students being involved in more industry-relevant projects. Close symbiotic engagement between industry and educational institutions may be a way to overcome some placement challenges.

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