Journal of Infrastructure Policy and Development 2026, 10(1), 11345.
https://doi.org/10.24294/jipd11345

Article

The need for professional skills, practices and attitude towards work-integrated learning in higher education

Ndukenhle Mathe[1], Strinivasan Soondrasan Pillay[1], Sizwe Vincent Mbona[2,*]

[1] Department of Economics, Faculty of Management Sciences, Durban University of Technology, Durban 4001, South Africa
[2] Department of Statistics, Faculty of Applied Sciences, Durban University of Technology, Durban 4001, South Africa
*** Corresponding author:** Sizwe Vincent Mbona, sizwem@dut.ac.za

CITATION

Mathe N, Pillay SS, Mbona SV. (2026). The need for professional skills, practices and attitude towards work-integrated learning in higher education. Journal of Infrastructure Policy and Development. 10(1): 11345. https://doi.org/10.24294/jipd11345

ARTICLE INFO

Received: 16 January 2025
Accepted: 11 February 2025
Available online: 7 February 2026

Abstract: Globally, Work-integrated learning (WIL) is considered a strategy for equipping students in higher education for the workplace by applying theoretical concepts to practice-based tasks, ultimately gaining the required employability skills. WIL fosters relationships between industries and universities by designing a curriculum that benefits both industry and the community. The implementation of WIL in universities calls for policy innovation in educational governance. Universities need to reform their curricular systems to better integrate WIL, which is in line with the broader trend of educational system reform. This study examined professional skills on WIL, practice on WIL and attitudes towards WIL using a dataset collected from students registered at the Durban University of Technology (DUT), South Africa. A quantitative method was applied to obtain results. This study used an online survey to allow enough time and honesty in responses. A total of 313 students responded to the questionnaire. Data analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 29.20. A p-value < 0.05 considered was considered statistically significant. The findings of this sample study showed that approximately 84.7% of students agreed that they are open, innovative, resilient and flexible, especially when things go sideways. About 58.1% of the respondents strongly agreed that WIL and related activities are fully practiced in the curricula from their academic departments. Moreover, 91% of participants agreed that WIL enhanced students' ability to understand more concepts; helped to understand limitations; helped students to communicate better with other professionals; and increased their ability to understand critical problems. Conclusions include WIL being incorporated into all courses offered in higher education, supported by pedagogical strategies that could enhance employability outcomes for graduates, which may have a positive impact on academic staff workload.

Keywords: employability; higher education; university graduates; WIL

1. Introduction

Work integrated learning (WIL) is an educational approach that connects classroom learning pwith related work hands-on experience in a relevant environment (Bowering et al., 2020). The primary objective of universities is to produce graduates with the necessary skills so that they can be employable. This can be achieved by extending classroom thoughts and exercise to work experience to meet diverse students and partner needs. Therefore, Robson (2023) states that university education is measured by its employability of their students. Belief in participating in WIL can be improved by familiarizing students with professional backgrounds and developing cultural capital. Reinhard et al. (2020) state that formal learning together with student exposure to hands-on work in their chosen career is the better method for preparing

undergraduates for entry into the work environment. The WIL component of the curriculum includes learning and practices by ensuring that students are being exposed to world-of-work. WIL is a strategy that can empower or support university students in their professional journey by developing professionalism, improving career clarity, building networks and aiding professional socialization (Jackson, 2017). Furthermore, according to Tertiary Education Quality and Standards Agency (TEQSA), WIL brings into line with quality standards relating to governance, as planning, advice and professional growth education (Campbell et al., 2019; TEQSA, 2022).

According to Reinhard et al. (2020), most graduates face similar challenges, including the ability to navigate and strive in a dynamic and rapidly changing workplace. These authors further stated that academic institutions sometimes lag in their curricula in relation to emergent technical and content needs, which will allow students to better exploit more transferable, employability relevant skills and knowledge. Burke et al. (2020) states that professional skills help graduates to be successful in their professional practice and become more employable. Jackson (2016) defined employability as possessing the right skill set to meet the needs of industry and is a prerequisite for graduates successfully entering the labor market on completion of their studies. The priority of preparing graduates to adapt to different work environments has converted into broad influential methods to graduate employability (Bridgstock, 2020; Jackson and Bridgstock, 2021).

The study by Agwa-Ejon and Pradhan (2017) concluded that WIL assists students to easily adjust to new situations and changing circumstances (adaptability). This involves being flexible, open-minded, willing to learn new things, and better equipped to handle challenges and uncertainties in the workplace. Previous authors (Jackson, 2015; Kay et al., 2018; Mandal et al., 2022; Pinto and Pereira, 2019) have shown that WIL is clearly related to face-to-face, online and global experiences to adapt students' capabilities. This was also confirmed by Olson et al. (2024) who stated that well thought graduates get easy access to work opportunities and resources. Work by Cturtle and Decision Lab (2019) concluded that many students are willing to learn and gain experience related to their career, specifically international students who frequently choose their country of education based on such opportunities. Universities of Australia (2015) indicated that WIL is one route for is improving graduates' employability and has gained recognition in Australia, driven by its national strategy. The Association of American Colleges and Universities (2018) states that most of the companies if not all appreciate hands-on learning experiences, especially internships. Furthermore, hands-on experience has gained a highly valued selection criterion amongst employers of graduates (NACE, 2018).

The authors of this study noted that many studies have been undertaken in checking the level of WIL amongst university students (Jackson and Cook, 2023; Lasen et al., 2018; Siddoo et al., 2018; Vu et al., 2022). However, very few, if none, had explored the level of WIL focusing on universities located in KwaZulu-Natal province, South Africa. Therefore, the purpose of this study is to explore professional skills in WIL, practice of WIL and attitude towards WIL using the dataset collected from students registered at the DUT, South Africa. The outcome of the study will provide practical information to higher institutions to initiate WIL in all programmes.

2. Materials and methods

2.1. Study setting, sampling procedure and data collection

This was a quantitative research study based in KwaZulu-Natal, South Africa. A cross-sectional study was conducted using online Google Forms. A structured questionnaire was designed and used to collect primary data from students. The study invited all students who have completed WIL as part of their qualifications to participate. The questionnaire was pre-tested electronically via email amongst potential participants across all six faculties within the DUT, inviting them to complete an online survey (convenience sampling method). A link was included in the email, and the respondents were requested to click on the link and complete the survey. The survey participation was voluntary and anonymous. Only one response was allowed per email, hence increasing the reliability of the data. A total of 313 students participated in the online survey. The questionnaire comprised closed and open-ended questions, which included demographic information and three sections to evaluate the perceptions of students of WIL. Each section asked participants to rate their feelings towards professional skills in WIL, practice of WIL and attitude towards WIL. A 5-point Likert Scale (1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree) was used to measure their responses.

2.2. Ethical considerations

This study received ethics approval from the Durban University of Technology Research Ethics Board. The complete questionnaire did not include any personal details about the individual participant. All data were kept confidential, and data protection was observed at all stages of the study. Approval from the participants for the web-based survey was obtained by telling them about the study purpose and the data collection intentions needed for completion.

2.3. Data analysis

Data was downloaded from Google Forms and saved to a Microsoft Office Excel document for pre-processing. The data were then imported into the Statistical Package for the Social Sciences (SPSS) version 29.20 for data analysis. A descriptive test was performed to describe participant characteristics. The Cronbach's alpha coefficient, a measure of reliability of the items and internal consistency of the constructs, was calculated. The chi-square test of independence was conducted to examine the relationship amongst faculties, level of qualification and whether or not a student had an opportunity to attend WIL training. Furthermore, the Spearman's rank order correlation coefficient was calculated to determine the relationship between two variables. Researchers stated the hypotheses before conducting the correlation analysis. The *p*-value less than 0.05 was considered as statistically significant.

2.4. Reliability statistics

Bell et al. (2022) describe reliability as the measurement instrument that produces the same outcome from the same inputs. It is calculated by taking several measurements on the same subjects. The Cronbach's alpha coefficient, a measure of

reliability of the items and internal consistency of the constructs and their stability (Nunnally and Bernstein, 1994), was calculated. Bagozzi and Yi (1998) advise that a reliability coefficient of 0.6, or one that exceeds Nunnally and Bernstein's (1994) threshold of 0.7, is considered as "acceptable", thus showing a degree of consistency and reliability for data analysis.

Table 1 shows Cronbach's alpha score for all the items that constituted the questionnaire. In all the sections, the Cronbach's alpha coefficient was more than the limit of 0.6, showing a degree of consistency and reliability for data analysis. The overall Cronbach's alpha was 0.988.

Table 1. Reliability statistics of the items in the questionnaire (n = 313).

Sections	Items	Cronbach's Alpha
B. Workplace learning	6	0.997
C. Practice on WIL	5	0.986
D. Attitude on WIL	11	0.991
Overall	**22**	**0.988**

3. Results

The demographic breakdown of the survey respondents in the current study shows that more than half (56.5%) of the participants were between 20–25 years old, followed by those who were above 25 years of age (41.2%) and 2.2% were below 20 years of age. There were more female (61.35%) than male (38.02%) participants in the study. The racial distribution amongst respondents highlights a predominantly Black African (77.6%), followed by Indian (13.1%), colored (5.8%) and White (3.5%) demographic (**Table 2**).

Table 2. Demographic characteristics of participants.

Demographics of participants	Students
	***n* = 313 (%)**
Age (years)	
Less than 20	7 (2.2)
20–25	177 (56.5)
More than 25	129 (41.2)
Gender	
Female	194 (62.0)
Male	119 (38.0)
Race	
Black African	243 (77.6)
Coloured	18 (5.8)
Indian	41 (13.1)
White	11 (3.5)

Table 3 below presents the percentage of respondents per faculty and the level of qualification they have achieved. The majority of the respondents were from the

Faculty of Management Sciences (26.5%) and Faculty of Health Sciences (25.6%). The researcher further observed that 56.9% of the respondents had a National Diploma, followed by those who had an Advanced Diploma (25.2%), Post-graduate Diploma (10.2%), master's degree (5.8%) and PhD (1.9%).

Table 3. Cross-tabulation and Chi-squared test (n = 313).

		Have you had opportunity to attend any WIL training course?		**TOTAL**	***p*-value**
		No	**Yes**		
Faculty	Accounting and Informatics	3 (1.0)	14 (4.5)	17 (5.4)	0.002*
	Applied Sciences	-	47 (15.0)	47 (15.0)	
	Arts and Design	1 (0.3)	26 (8.3)	27 (8.6)	
	Built Environment and Engineering	2 (0.6)	57 (18.2)	59 (18.8)	
	Health Sciences	1 (0.3)	79 (25.2)	80 (25.6)	
	Management Sciences	4 (1.3)	79 (25.2)	83 (26.5)	
Qualification level	National Diploma	4 (1.3)	174 (55.6)	178 (56.9)	0.303
	Advanced Diploma	3 (1.0)	76 (24.3)	79 (25.2)	
	Post-graduate Diploma	2 (0.6)	30 (9.6)	32 (10.2)	
	Master's Degree	2 (0.6)	16 (5.1)	18 (5.8)	
	PhD	-	6 (1.9)	6 (1.9)	

*p-value <0.05 was regarded as indicating statistical significance

Most of the students from all faculties indicated that they had an opportunity to attend WIL training courses, and these results were found to be statistically significant (p-value = 0.002) when testing them using a Chi-squared test. Furthermore, the results show that most students attended WIL training apart from the qualification they had achieved. However, these results were found to be not statistically significant (p-value = 0.303).

3.1. Respondents' perspectives on work integrated learning (WIL)

Table 4 presents the Likert Scale questions included in the questionnaire. The following sections (B, C and D) provide the descriptive statistics on the Likert Scale questions. The researchers used frequency tables to present data. Each section provides the results of the respondents' scoring patterns per variable. The sub-sections sought to establish whether students in general have related workplace learning skills; whether students are exposed to the practice of WIL in higher institutions; and whether students have a positive attitude towards WIL.

3.2. Workplace learning skills

Table 5 presents the descriptive statistics of responses to the questions relating to workplace learning skills. A higher number of students, 265 (84.7%) agreed/strongly agreed that they are open, innovative, resilient and flexible, particularly when things do not go as planned (Statement B1), while 84.6% agreed/strongly agreed/strongly agreed that they are proficient in using computers and technology efficiently (Statement B2). The results in **Table 5** also highlight that 85%

of the participants agreed/strongly agreed that they are capable to think creatively, solving problems effectively and making informed decisions (Statement B3); they have the skills of organizing and aligning tasks and objectives into a schedule (Statement B5); and they have skills that involve analyzing a problem, generating and implementing a solution, and assessing the success of the plan (Statement B6). Furthermore, the results in **Table 5** also show that most students (85.3%) agreed/strongly agreed that they do have the ability to work in groups to pursue common goals (Statement B4).

Table 4. Presentation of questions per section (n = 313).

Sections	Items	Questions
B. Workplace learning skills	B1	**Adaptability:** I am open, innovative, resilient and flexible, particularly when things do not go as planned.
	B2	**Computer literacy:** I am proficient in using computers and technology efficiently.
	B3	**Problem-solving:** I am capable to think creatively, solving problems effectively and making informed decisions.
	B4	**Team working:** I am capable of working in groups to pursue common goals.
	B5	**Time management:** I have the skill of organizing and aligning tasks and objectives into schedule. It involves planning time effectively so that the right time is allocated to the right activity.
	B6	**Critical thinking:** I have the skills that involve analyzing a problem, generating and implementing a solution, and assessing the success of the plan.
C. Practice of WIL	C1	WIL and related activities are fully practiced in the curriculum in my department.
	C2	The programme I am in provide assessment opportunities for WIL related activities.
	C3	Lecturers in my profession have good working relationship with individuals from industries.
	C4	There are resources within the faculty to promote/support WIL activities.
	C5	I would benefit in WIL from collaborative projects with peers.
D. Attitude towards WIL	D1	WIL will help me to think positively.
	D2	WIL in the undergraduate programme will help the graduates to become better team-workers.
	D3	Communication skills should be developed in integrated undergraduate classes.
	D4	Undergraduate students do not need to study together.
	D5	Learning with students in other professional could help to become more effective individual.
	D6	WIL will enhance learners to gain deeper knowledge.
	D7	WIL will help learners to recognize their own professional limitations.
	D8	WIL will help students to communicate in a professional manner.
	D9	WIL will foster students' ability to understand critical problems.
	D10	Teamwork skills are crucial for all students to develop.
	D11	Students in my discipline need to be trained and collaborate with other professionals.

3.3. Practice of WIL

In this section, the researchers investigated the practices of WIL. The result is presented in **Table 6**. More than half of the students (58.1%) who participated in the study strongly agreed that WIL and related activities are full practiced in the curriculum of their academic departments (Statement C1), while 58.8% strongly agreed that the programme provides assessment opportunities for WIL-related activities (Statement C2). The researcher also observed that 170 students, at 54.3%, strongly agreed that academic lectures have a good working relationship with individuals from industries (Statement C3), while 58.5% believed that resources

within the faculty are enough to promote and support WIL activities (Statement C4). Furthermore, 185 (59.1 %) students strongly agreed that they benefited from WIL by working on a small group project with other students (Statement C5).

Table 5. Scoring patterns relating to workplace learning skills (*n* = 313).

Items	Workplace learning skills	Responses	Response options				
			SD	D	NS	A	SA
B1	I am open, innovative, resilient and flexible, particularly when things do not go as planned.	Count	37	6	5	91	174
		Percentage	11.8	1.9	1.6	29.1	55.6
B2	I am proficient in using computers and technology efficiently.	Count	32	11	5	89	176
		Percentage	10.2	3.5	1.6	28.4	56.2
B3	I am capable to think creatively, solving problems effectively and making informed decisions.	Count	31	12	4	92	174
		Percentage	9.9	3.8	1.3	29.4	55.6
B4	I have the ability of working in groups to pursue common goals.	Count	31	11	4	91	176
		Percentage	9.9	3.5	1.3	29.1	56.2
B5	I have the skill of organizing and aligning tasks and objectives into schedule. It involves planning time effectively so that the right time is allocated to the right activity.	Count	35	9	3	88	178
		Percentage	11.2	2.9	1.0	28.1	56.9
B6	I have the skills that involves analysing a problem, generating and implementing a solution, and assessing the success of the plan.	Count	33	10	4	88	178
		Percentage	10.5	3.2	1.3	28.1	56.9

SD = Strongly disagree; D = Disagree; NS = Not sure; A = Agree; SA = Strongly agree.

Table 6. Scoring patterns relating to practice of WIL (n = 313).

Items	Practice of WIL	Responses	Response options				
			SD	D	NS	A	SA
C1	WIL and related activities are fully practiced in the curriculum in my department.	Count	19	4	11	97	182
		Percentage	6.1	1.3	3.5	31.0	58.1
C2	The programme I am in provide assessment opportunities for WIL related activities.	Count	16	6	11	96	184
		Percentage	5.1	1.9	3.5	30.7	58.8
C3	Lecturers in my profession have good working relationship with individuals from industries.	Count	22	3	15	103	170
		Percentage	7.0	1.0	4.8	32.9	54.3
C4	There are resources within the Faculty to promote/support WIL activities.	Count	19	6	8	97	183
		Percentage	6.1	1.9	2.6	31.0	58.5
C5	I would benefit in WIL from collaborative projects with peers.	Count	18	5	8	97	185
		Percentage	5.8	1.6	2.6	31.0	59.1

SD = Strongly disagree, D = Disagree, NS = Not sure, A = Agree, SA = Strongly agree.

3.4. Attitude towards WIL

This section presents the scoring patterns relating to attitude towards WIL. These results are presented in **Table 7**. The results showed that 189 (60.4%) of the students strongly agreed that WIL is helping students to think positively (Statement D1), while 187 (59.7%) strongly agreed that WIL in the undergraduate programme helps the graduates to become better team-workers. (Statement D2). A majority at 188 (60.1%) of the students felt that communication skills should thought within a combined class of undergraduate students (Statement D3). Moreover, more students (54.6%) strongly

agreed that it is not necessary for undergraduates to learn together (Statement D4), and 58.1% strongly agreed that studying with students who are doing other qualifications could assist in becoming an effective individual (Statement D5). Approximately 91% of the participants agreed/strongly agreed that WIL enhanced students' ability to understand more things (Statement D6); WIL helps to understand limitations (Statement D7); WIL help students to communicate effectively with other professionals (Statement D8); WIL increases the ability to understand critical problems (Statement D9); teamwork skills are crucial for all students to develop (Statement D10); and students from different disciplines need to be trained and collaborate with other professionals (Statement D11).

Table 7. Scoring patterns relating to attitude on WIL (n = 313).

Items	Attitude towards WIL	Responses	Response options				
			SD	D	NS	A	SA
D1	WIL will help me to think positively.	Count	20	1	6	97	189
		Percentage	6.4	0.3	1.9	31.0	60.4
D2	WIL in the undergraduate programme will help the graduates to become better team-workers.	Count	14	7	8	97	187
		Percentage	4.5	2.2	2.6	31.0	59.7
D3	Communication skills should be developed in integrated undergraduate classes.	Count	19	2	6	98	188
		Percentage	6.1	0.6	1.9	31.3	60.1
D4	Undergraduate students do not need to study together.	Count	17	9	21	95	171
		Percentage	5.4	2.9	6.7	30.4	54.6
D5	Learning with students in other professional could help to become more effective individual.	Count	18	3	7	103	182
		Percentage	5.8	1.0	2.2	32.9	58.1
D6	WIL among students will enhance their ability to understand more things.	Count	15	6	6	100	186
		Percentage	4.8	1.9	1.9	31.9	59.4
D7	WIL will help learners to recognize their own professional limitations.	Count	20	4	5	100	184
		Percentage	6.4	1.3	1.6	31.9	58.8
D8	WIL will help students to communicate in a professional manner.	Count	17	5	5	99	187
		Percentage	5.4	1.6	1.6	31.6	59.7
D9	WIL will foster students' ability to understand critical problems.	Count	18	3	6	97	189
		Percentage	5.8	1.0	1.9	31.0	60.4
D10	Teamwork skills are crucial for all students to develop.	Count	13	8	6	99	187
		Percentage	4.2	2.6	1.9	31.6	59.7
D11	Students in my discipline need to be trained and collaborate with other professionals.	Count	18	3	6	98	188
		Percentage	5.8	1.0	1.9	31.3	60.1

SD = Strongly disagree, D = Disagree, NS = Not sure, A = Agree, SA = Strongly agree.

3.5. Hypothesis testing

The researchers of this study used inferential statistics to test hypotheses. A hypothesis is defined as the claim of the researcher's expectation or prediction about the relationship amongst study variables (Picardi and Masick, 2013). The main aim of hypothesis testing is to try to understand statistically significant relationships that mean that the difference in results did not occur by chance but due to statistical reasons

(Anupama, 2018). Previous authors such as Cooper and Schindler (2014) and Johnson (2010) stated that a hypothesis is formulated in order to be tested using an empirical methodology before it can be rejected, revised or accepted.

The researchers in this study conducted the Spearman's Rank correlation coefficient to measure the relationship between two variables. The test was employed because the variables have categories with a natural order (Caruso and Cliff, 1997; Kutner et al., 2005). The correlation analysis assisted in the determination of the connection between the response variable and explanatory variable.

The results in **Table 8** present correlations between the measured sections. The researchers found that workplace learning skills and the practice of WIL are positively significantly correlated ($\square_{\square}$ = 0.695, *p*-value < 0.001). This suggests that WIL plays a significant role in preparing students for professional skills, fostering a comprehensive learning environment that combines theoretical knowledge with practical experience. The researchers further observed a positive significant relationship between the workplace learning skills and attitude towards WIL ($\square_{\square}$ = 0.681, *p*-value < 0.001). Lastly, the results indicate that positive attitude towards WIL is significantly related to an increase in the practice of WIL ($\square_{\square}$ = 0.828, *p*-value < 0.001).

Table 8. Spearman's correlation analysis (*n* = 313).

	Spearman's correlation (r_s)	**N**	***P*-value**
Workplace learning skills ↔ Practice on WIL	0.695	313	<0.001*
Workplace learning skills ↔ Attitude on WIL	0.681	313	<0.001*
Practice on WIL ↔ Attitude on WIL	0.828	313	<0.001*

**p*-value <0.05 was regarded as indicating statistical significance

3.5.1. Hypothesis 1

$\square_1$: Good relationships between lecturers and individuals from industries have a significant impact on students to have the ability of working in groups to pursue common goals.

Table 9 above shows that the Spearman's Rank Order Correlation Coefficient (r_s) was significant (r_s = 0.607; *p*-value < 0.001). This suggest that there is a significant association between the working together of lecturers and industries, and the impact they have on students having the ability to work in groups to pursue common goals. The hypothesis is therefore accepted.

Table 9. Relationship between lecturers and industries.

Statements B4 and C3			**C3**
Spearman's rho	B4	Correlation Coefficient	0.607
		p-value	<0.001*
		N	313

**p*-value <0.05 was regarded as indicating statistical significance

3.5.2. Hypothesis 2

H_2: There is association between learning with students in other professions and being capable to think creatively, solving problems effectively and making informed decisions.

The results in **Table 10** above indicate that there is a significant relationship between learning with students in other professions and thinking creatively, to make decisions, and to solve problems (r_s = 0.693; *p*-value <0.001). Therefore, the hypothesis is also accepted.

Table 10. Relationship between learning with students from other professions and be capable to think creatively, solving problems effectively and making informed decisions.

Statements B4 and C3			**D5**
Spearman's rho	B3	Correlation Coefficient	0.693
		p-value	<0.001*
		N	313

**p*-value <0.05 was regarded as indicating statistical significance

3.5.3. Hypothesis 3

H_3: Resources within the Faculty to promote/support WIL activities and being able to analyse a problem, generate and implement a solution, and assessing the success of the plan are significantly related.

Table 11 highlights a significant correlation between resources within the faculty to promote/support WIL activities and being able to analyze a problem, generate and implement a solution, and assessing the success of the plan, where H_3 = 0.686 and *p*-value <0.001. Hence, the hypothesis was accepted.

Table 11. Relationship between resources within the faculty to promote/support WIL activities and being able to analyze a problem, generate and implement a solution, and assessing the success of the plan.

Statements B6 and C4			**C4**
Spearman's rho	B6	Correlation Coefficient	0.686
		p-value	<0.001*
		N	313

**p*-value <0.05 was regarded as indicating statistical significance

4. Discussion

Evaluating student learning and skill development in WIL is a multifaceted task. Jackson (2013) mentions that WIL provides a means of making graduates "work ready" which in turn enhances their skills and employability. The objective of this study was to assess the effect of co-operative education programs on student learning and the acquisition of professional skills using data collected at the DUT. The research objectives focus on exploring the influence of co-operative education on students, particularly in terms of concrete experience, the development of professional skills, and active experimentation during work-integrated learning. The results of this study

show that a significant proportion of students acknowledged the integration of WIL in their academic programs.

Most students (84.7%) in this study agreed/strongly agreed that they are flexible, innovative, open, and resilient, showcasing adaptability and problem-solving skills. Two hundred and sixty-five (84.6%) students agreed/strongly agreed that they possess proficient in using computers and technology efficiently, highlighting technical proficiency. The vast majority of students (89.1%) agreed that WIL and related activities are fully practiced in the curriculum, indicating a strong presence of practical learning opportunities, while 89.5% agreed/strongly agreed that the program provides assessment opportunities for WIL-related activities, highlighting the structured evaluation of practical skills. These results indicated a significant improvement of the perspectives of university students towards WIL, as proposed by Roopnarain and Akoobhai (2014). These authors further stated that employers can influence the curriculum with new ideas and ever-changing technology. Previous findings indicated that students were generally not well-prepared for WIL, and they have poor attitudes towards the working industry, as well as a lack of professionalism (Govender, 2020; Sibiya and Sibiya, 2014; Zegwaard and Hoskyn, 2015). In this study, the researchers found that workplace learning skills were significantly related to the practice of WIL and attitudes towards WIL. The researchers further observed that there is a significant relationship between the practice of WIL and attitude towards WIL.

Study limitations and recommendations

The study was limited to students who have completed WIL. Academic staff were not included in the survey. Furthermore, the online survey was a cross-sectional survey. There is a need to consider longitudinal surveys when exploring graduate employability and employment. In addition, different datasets are required to get more evidence of the impact of WIL on employability and job outcomes. Government interventions to support higher education institutions with the inclusion of WIL across all programmes are likely to bring economic power and advantages to society by industries. Tomlinson and Jackson (2021) highlighted wider benefits of WIL that helps industry demands for graduates who are capability to contribute effectively, flexibly and innovatively in complex work environments.

5. Conclusion

While employability seems to gain more attention and scholarly discussion in literature, significant gaps remain in the evidence connecting the successful development of work-ready skills to their impact on graduate employability, employment outcomes and long-term career progression. Academics and professional developers need to support students from all disciplines and their professional partners to engage in designing and implementing assessment and reflective practices that foster the integration of students' learning between university and workplace settings while supporting the attainment of advanced learning outcomes.

Author contributions: Conceptualization, NM and SVM; methodology, NM; software, SVM; validation, NM, SVM and SSP; formal analysis, SVM; investigation,

NM; resources, SSP; data curation, NM; writing—original draft preparation, NM; writing—review and editing, SVM; visualization, SSP; supervision, SSP; project administration, NM. All authors have read and agreed to the published version of the manuscript.

Funding: The authors received no financial support.

Acknowledgements: We wish to thank all the respondents for their time during the survey. The authors would also like to thank the reviewers for providing comments in helping this manuscript to completion.

Conflicts of interest: The authors declare that they have no potential conflicts of interest.

Data availability statement: Data will be available on request from the corresponding author.

References

Agwa-Ejon, J. F., Pradhan, A. (2017). The impact of work integrated learning on engineering education. In: Proceedings of the 2017 IEEE Global Engineering Education Conference (EDUCON); 26–28 April 2017; Athens, Greece.

Anupama, K. (2018). Hypothesis types and research. International Journal of Nursing Science Practice and Research, 4(2), 78–80.

Association of American Colleges and Universities. (2018). Fulfilling the American dream: Liberal education and the future of work. Association of American Colleges and Universities.

Bagozzi, R. P., Yi, Y. (1988). On the evaluation of structural equation models. Journal of the Academy of Marketing Science, 16, 74–94.

Bell, E., Bryman, A., Harley, B. (2022). Business research methods. Oxford university press.

Bowering, E., Frigault, C., Yue, A. R. (2020). Preparing undergraduate students for tomorrow's workplace: Core competency development through experiential learning opportunities. Canadian Journal of Career Development, 19(1), 56–68.

Bridgstock, R. (2020). Graduate Employability 2.0: Enhancing the Connectedness of Learners, Programs and Higher Education Institutions. Australian Capital Territory, Department of Education, Skills and Employment.

Burke, C., Scurry, T., Blenkinsopp, J. (2020). Navigating the graduate labour market: the impact of social class on student understandings of graduate careers and the graduate labour market. Studies in Higher Education, 45(8), 1711–1722.

Campbell, M., Russell, L., McAllister, L., et al. (2019). A framework to support assurance of institution-wide quality in work-integrated learning. Australian Collaborative Education Network (ACEN).

Caruso, J. C., Cliff, N. (1997). Empirical size, coverage, and power of confidence intervals for Spearman's rho. Educational and Psychological Measurement, 57(4), 637–654.

Cooper, D. R., Schindler, P. (2014). Business Research Methods. McGraw-Hill Publishing.

Cturtle and Decision Lab. (2019). International Student Employment Outcomes and Satisfaction Report. Cturtle.

Govender, D. D. (2020). Student Preparedness for Work Integrated Learning (WIL) in Biomedical Technology [PhD thesis]. Durban University of Technology.

Jackson, D. (2013). The contribution of work-integrated learning to undergraduate employability skill outcomes. Asia-Pacific Journal of Cooperative Education, 14(2), 99–115.

Jackson, D. (2015). Employability skill development in work-integrated learning: Barriers and best practice. Studies in Higher Education, 40(2), 350–367.

Jackson, D. (2016). Re-conceptualising graduate employability: The importance of pre-professional identity. Higher Education Research & Development, 35(5), 925–939.

Jackson, D. (2017). Developing pre-professional identity in undergraduates through work-integrated learning. Higher Education, 74(5), 833–853.

Jackson, D., Bridgstock, R. (2021). What actually works to enhance graduate employability? The relative value of curricular, co-curricular, and extra-curricular learning and paid work. Higher Education, 81(4), 723–739.

Jackson, D., Cook, E. J. (2023). Benefits of work-integrated learning for students. In: The Routledge International Handbook of Work-Integrated Learning. Routledge Publishing. pp. 93–112.

Johnson, P. E. (2010). Darwin on Trial. InterVarsity Press.

Kay, J., Ferns, S., Russell, L., Smith, J. (2018). Expanding WIL possibilities: Enhancing student employability through innovative WIL models. Australian Technology Network of Universities.

Kutner, M. H., Nachtsheim, C. J., Neter, J., Li, W. (2005). Applied Linear Statistical Models. McGraw-Hill Publishing.

Lasen, M., Evans, S., Tsey, K., et al. (2018). Quality of WIL assessment design in higher education: A systematic literature review. Higher Education Research & Development, 37(4), 788–804.

Mandal, N. K., Edwards, F. R. (2022). Student work readiness in Australian engineering workplaces through work integrated learning. Higher Education, Skills and Work-Based Learning, 12(1), 145–161.

NACE. (2018). Job Outlook 2019. National Association of College Employers.

Nunnally, J. C., Bernstein, I. H. (1994). Psychometric Theory, 3rd ed. McGraw-Hill Publishing.

Olson, D. A., Jeske, D., Shultz, K. S. (2024). Developing, nurturing, and expanding personal and professional relationships through social media. In: Benson V (editior). Handbook of Social Media Use Online Relationships, Security, Privacy, and Society, Volume 2. Academic Press. pp. 195–215.

Picardi, C. A., Masick, K. D. (2013). Research methods: Designing and Conducting Research with a Real-World Focus. Sage Publications.

Pinto, L. H., Pereira, P. C. (2019). 'I wish to do an internship (abroad)': investigating the perceived employability of domestic and international business internships. Higher Education, 78, 443–461.

Reinhard, K., Wynder, M., Kim, W. S. (2020). Developing Best Practice for Cooperative and Work-Integrated Education: Lessons from Germany, Australia and South Korea. International Journal of Work-Integrated Learning, 21(2), 177–191.

Robson, J. (2023). Graduate employability and employment. In: Assessing the Contributions of Higher Education. Edward Elgar Publishing. pp. 177–196.

Roopnarain, S., Akoobhai, B. (2014). Workplace based experience (WBE)–preparing the student for the world of work. The African Journal for Work-based Learning, 2, 47–56.

Sibiya, N. E., Sibiya, M. N. (2014). Work integrated learning experiences of primary health care post-basic nursing students in clinical settings: A university of technology context. South African Journal of Higher Education, 28(6), 1943–1958.

Siddoo, V., Janchai, W., Sawattawee, J. (2018). A Systematic Review of Work-Integrated Learning for the Digital Economy. International Journal of Work-Integrated Learning, 19(4), 385–398.

TEQSA. (2022). Guidance Note: WI. Tertiary Education Quality and Standards.

Tomlinson, M., Jackson, D. (2021). Professional identity formation in contemporary higher education students. Studies in Higher Education, 46(4), 885–900.

Universities Australia. (2015). National strategy on work integrated learning in university education. Universities Australia.

Vu, T., Ferns, S., Ananthram, S. (2022). Challenges to international students in work-integrated learning: A scoping review. Higher Education Research & Development, 41(7), 2473–2489.

Zegwaard, K. E., Hoskyn, K. (2015). A review of trends in research methods in cooperative education. In: Proceedings of the 18th New Zealand Association for Cooperative Education Conference; 6–8 April 2018; Rotorua, New Zealand.