INTERNATIONAL PERSPECTIVES

Work-Integrated Learning in Environmental Health: A Cross-Program Perspective of Higher Education Institutions in South Africa

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Abstract **Work-integrated learning (WIL) is a crucial component of graduate readiness. The exposure to real-world work experience that WIL offers increases the capabilities of graduates, thereby increasing employability. In environmental health, WIL is an understudied area in the higher education context. This article explores the WIL practices of environmental health programs and provides a comparison of WIL coordination and related components across academic institutions. Data were collected via a quantitative research approach using questionnaires on WIL coordination and challenges experienced by WIL coordinators. The findings demonstrate that there is a substantial difference in the coordination of WIL across participating programs, with disparities in the integration of WIL. The majority of participating programs incorporate WIL as an independent module, although some programs integrate WIL activities into academic modules or through WIL placements. The classification of WIL activities and documentation of WIL were varied. This study highlights the need for a guideline on standard practice for consistency of WIL across environmental health programs.**

Keywords: environmental health, work-integrated learning, WIL, standard practice, higher education institutes, South African universities, workforce development

Introduction

Work-integrated learning (WIL) can be described as curriculum design in which students are exposed to professional work or other field situations that are relevant to their field of study (Ferns et al., 2025). The South African Council on Higher Education (CHE) defines WIL as an umbrella term that describes curricular, pedagogy, and assessment practices of different disciplines that integrate formal learning and workplace exposure (Council on Higher Education [CHE], 2011).

The purpose of a WIL program is to provide students with the opportunity to apply and learn disciplinary knowledge and skills in real-world contexts, thereby improving employability and graduation rates (Aprile & Knight, 2020). Graduate employability is an integral objective of tertiary education (Billett, 2022). Students are trained and gain skills for the working world through knowledge and practice. WIL is a mechanism that enables students to improve their employability. Work placements provide students with the opportunity to work alongside an established practitioner in their area of study to gain exposure to real workplace practice (Ferns, 2014). Work placements provide authentic opportunities and environments for learners to draw on theoretical knowledge and build practical knowledge and skills in real-world or simulated work environments (Environmental Health Australia, 2014). Thus, WIL enables career-focused learning coupled with workplace exposure (Tamin et al., 2018). Ferns (2014) explains that work placements allow students the opportunity to engage with an "authentic workplace of practice," leading to career and academic benefits. South African students have described the WIL experience as "rewarding," "amazing," and say that "reality is better" (Taylor & Govender, 2017).

According to CHE (2011), WIL promotes academic performance by encouraging enhanced thinking and fostering student motivation to learn. Students develop communication, relationship, and leadership skills through facilitated teamwork at the WIL placement site. WIL also provides students with clarity on their career choices, enables employment opportunities, and instills positive work ethics. WIL exposure allows students the opportunity to develop their competency in technical knowledge and skills (CHE, 2011). In the environmental health field, however, WIL is understudied in South Africa. Research has been conducted in Australia (Dunn et al., 2018; Universities Australia, 2019) but not in Africa or South Africa.

This lack of research has led to a gap in the literature related to WIL in environmental health. There are a few policies and guidelines, however. Australia has developed a WIL policy for environmental health that

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regulates the activities that constitute WIL. Similarly, the South African CHE has developed a good-practices guide for WIL to aid universities in planning, implementing, and managing WIL (CHE, 2011). The guide is generalized to WIL across all disciplines.

There is a skills crisis in South Africa, which places greater responsibility on tertiary institutions to train graduates to fill the gaps in the labor market. These skills can be difficult to learn in a formal classroom but can be acquired through WIL (Orrell, 2011). Research on WIL has been conducted in South Africa related to town and regional planning (Lewis et al., 2010), engineering (Karim et al., 2019; Mutereko & Wedekind, 2016), and some health programs (du Plessis, 2019; Sibiya & Sibiya, 2014), although WIL remains an understudied area in the field of environmental health.

In South Africa, environmental health programs are offered by accredited universities in accordance with the guidelines provided by the Health Professions Council of South Africa (HPCSA), which is the professional body that governs the field of environmental health. HPCSA has mandated that environmental health degrees contain a WIL component, which is a requirement for professional accreditation by HPCSA. Students are approved for graduation if the 100-day WIL requirement has been met.

General WIL policies exist within universities (Cape Peninsula University of Technology, n.d.; Central University of Technology, 2022; Durban University of Technology, n.d.; Nelson Mandela University, 2007; Tshwane University of Technology, 2022; University of Johannesburg, 2014), but none is specific to environmental health WIL.

This research study aimed to provide an understanding of the status of WIL at all South African universities that offer an environmental health program. This study allowed for a glimpse into WIL activities as conducted by each participating university. The research findings provide a basis for comparison with international practice and South African CHE guidelines for the recommendation of a standardized guideline for good practice, which could be adopted across all environmental health programs. The limited research in the field and profession of environmental health makes this research relevant and enables an exploration of an academic aspect of environmental health that has previously not been researched in South Africa.

Methods

Research Design and Study Setting

A quantitative approach was employed using a descriptive, cross-sectional study design. Quantitative data collection was the most appropriate method based on the objectives of this study. The study setting included all South African universities that offered an environmental health degree. The aim of this study was to determine the WIL practices of environmental health programs at different universities in South Africa. Data collection involved an online questionnaire taken by WIL coordinators at participating universities. The questionnaire collected data on the main aspects involved in the coordination, integration, management, and administration of WIL within the environmental health academic program. A purposive sampling technique was used, as there was an identified cohort of participants relevant to the research study (Creswell, 2012). Prior to data collection, ethics approval was received from the research departments of all participating institutions, department heads, and the WIL coordinators.

Participants and Sampling Technique

There are five universities of technology (UoT) and two comprehensive universities that offer environmental health programs in South Africa. At one UoT, however, the researcher who conducted this study is the WIL coordinator; therefore, this university was not included. In total, six universities were invited to participate in this study.

Each environmental health program has one designated staff member who is the WIL coordinator and manages the WIL activities. Gatekeeper permission was received from all universities and respective department heads of the environmental health programs. All WIL coordinators were invited via an email from the department head's office. Out of the six invitations, five WIL coordinators responded, resulting in two male participants and three female participants being included in this study. WIL coordinators were all academics tasked with the coordination of WIL as an additional function to their academic responsibilities.

Data Collection and Data Analysis

After receiving completed consent forms from the WIL coordinators, participants were sent a link to an online questionnaire that used Microsoft Forms to collect data. Questions were grouped into categories to gather information on the general WIL processes used at the various universities, the type of WIL activities used, and the challenges experienced by each WIL coordinator. Data were recorded, screened, and sorted using Microsoft Excel; thereafter, statistical analysis was conducted using the Statistical Package for the Social Sciences (SPSS) software for quantitative data analysis. Due to the small sample size, the data allowed for basic analysis to generate chi-square tests of independence and to examine associations between variables. A statistically significant relationship was taken as $p < .05$. Graphic representation of responses was presented using tables and graphs. Open-ended questions were included to understand the unique challenges experienced by the WIL coordinators.

Results

WIL Practices of Environmental Health Programs

Data analysis illuminated WIL practices and challenges reported by WIL coordinators in the participating university environmental health programs. Most of the participants (4 out of 5 [80%]) of the WIL coordinators reported that their environmental health program had a policy, guideline, or standard operating procedure (SOP) in place for the WIL process. For participating universities that had a policy, guideline, or SOP, they explained that their universities provided detailed and specific guidelines related to the scope of work for implementing and maintaining WIL; the modalities of WIL; partner engagement; and the process for WIL requests, follow-ups, and logbooks. These guidelines, however, were not specific to environmental health but were based on general WIL, which consisted of WIL programs in other departments such as engineering, human resources, hospitality, and chemistry.

Integration of WIL Activities

How WIL was included in each environmental health program differed among the universities. Participants shared how WIL was inte-

grated into their academic program. Two of the five participants (40%) in this study mentioned that WIL was a separate credit-bearing module. This structure enables scheduling, finance, and credit allocation for WIL because it is part of the curriculum. In contrast, one university has all WIL activities embedded into core modules as an add-on activity that exposes students to the practical components of that module's content. The other two participants explained that WIL at their universities was accomplished predominantly through a) placement at external sites (e.g., local government) or b) a combination of placements and module activity integration (Table 1).

TABLE **1**

Work-Integrated Learning Methods Used in Environmental Health Programs

Method	# of Responses
Integrated into modules	1
Integrated into placements	1
Integrated into modules and placements	1
Allocated as a separate module	2

TABLE **2**

Frequency of Work-Integrated Learning (WIL) Activity Recordings in Environmental Health Programs

Recording Frequency	# of Responses
At the end of every month	2
After each WIL activity is completed	1
At the end of the year	1
At the end of each semester	1

WIL Record Management

Recordkeeping and management of WIL activities are an integral part of a WIL coordinator's role. HPCSA requires institutions to maintain a good recordkeeping system that enables real-time tracking of the progress of individual students toward the 100-day requirement. The majority of participants (80%) have an electronic system for recording WIL activities. Students are often allocated logbooks, which are used to document their WIL activities. Logbooks are the standardized method provided by HPCSA for students to manually record WIL. The university can tailor this system based on their needs. The frequency of recording activities and checking logbooks is at the discretion of the WIL coordinator and can influence the accuracy of WIL records. Participants shared their practices for how they managed the logbooks (Table 2).

The cooperative education department of an institution acts as the intermediary between the university and the employer (Durban University of Technology Cooperative Education, n.d.). This department plays a vital role in assisting with the management of WIL and sharing employment opportunities. External organizations often approach the cooperative education department when seeking interns or hiring new graduates. This department has strong relationships and networks that can assist with potential WIL placement sites.

Study findings showed that only two out of five (40%) of the participating universities work with their cooperative education department or any other department at their university for assistance in planning WIL or placing students in work settings. WIL placements can occur for 1–3 weeks based on the length of the vacation period in which the student is placed. Feedback from supervisors gives the universities valuable insights to improve the efficiency and effectiveness of the WIL process (Figure 1).

WIL Activities

Historically, environmental health WIL programs have relied on the acceptance of student placements by local government environmental health departments, but this approach is no longer sustainable. Placements are shared among different universities and often cannot accommodate every student who requires a placement in a particular office. In response, WIL coordinators have resorted to more resourceful and innovative approaches to ensure the WIL requirement is met regardless of the acceptance of students at work placement sites. This more flexible approach provides students with a plethora of WIL activities to contribute toward their 100-day WIL requirement. Table 3 summarizes the different activities that constitute WIL activities at the participating universities.

Challenges WIL Coordinators Report

One challenge WIL coordinators reported difficulty with was signing memorandums of understanding (MOUs) with placement sites to formalize the agreement about the WIL placement. Some placement sites will not engage with a university without the MOU being approved. This limitation curtails the options for student placement, even where the opportunity exists. Some universities are in a province that cannot accommodate the number of students requiring placement, which places a strain on the WIL coordinator to source alternate placement sites. The lack of response from industry is a contributing factor to the strain. And the lack of funding for WIL activities places a burden on departments and further restricts the options for WIL activities.

Another challenge mentioned by the participating WIL coordinators was the students' role in recordkeeping. They reported that students often forget to enter WIL activity information, which leads to a lack of documentation of WIL days. Additionally, students who have modules across two levels of study (e.g., 3rd and 4th year) often cannot attend or complete planned WIL activities due to scheduling conflicts. Addressing these challenges can cause further strain on the WIL coordinator, but issues can be avoided if there is sufficient and efficient communication on the part of the student.

FIGURE **1**

Placement Site Participant Feedback Regarding the Work-Integrated Learning Program

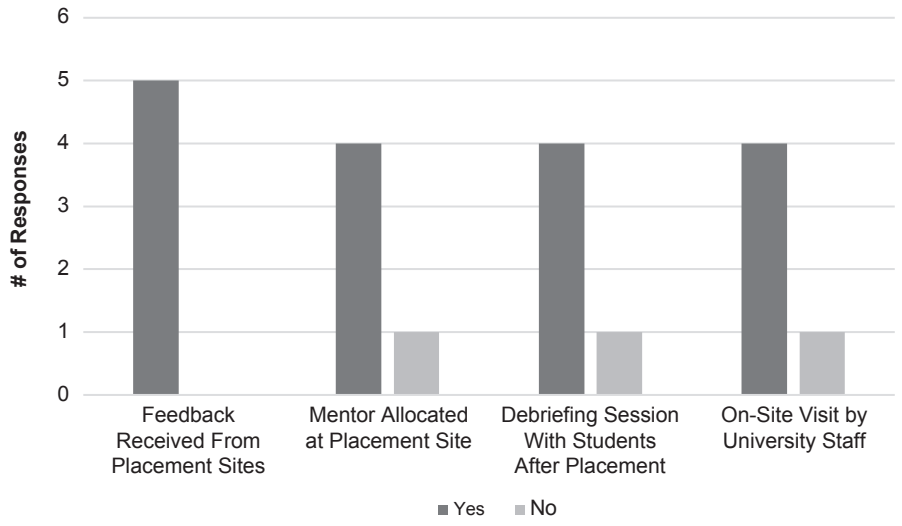

TABLE **3**

Reporting of Work-Integrated Learning (WIL) Activities in Environmental Health Programs

WIL Activity	Yes	No
Private sector used for WIL placement	4	1
Placement at industry or private sector for 1 week or more	5	0
Assessment linked to WIL activity	4	1
Nonplacement activities	# of Activities Recorded	
Guest lectures	3	
Community surveys or engagements	3	
On-campus inspections, activities, or events	1	
Site visits, field trips, or educational tours	3	
Practicals	1	
Assignments	3	
Presentations	3	
Seminars and webinars	2	

In most institutions, the WIL coordinator is an academic who is tasked with performing WIL functions as an administrative add-on role. This add-on was viewed by the participating WIL coordinators as an administrative load placed on the individual and was described as being overwhelming at times. As an academic, the WIL coordinator is required to lecture, conduct research, and engage in community projects. Additionally, the WIL coordinator manages the WIL program and also provides on-site supervision of visiting students during WIL placements.

The participating WIL coordinators described HPCSA as having "unrealistic expectations" regarding WIL and as having little or no clear guidelines for the logbooks. One participant mentioned that higher education institutions are using different WIL modalities but are evaluated by the same body, which raises concerns around inconsistencies and the need for standardization.

Standardization, however, might not be the best option in the environmental health field. Participants felt it could take away the "autonomy and competitive edge" of the respective higher education institutions and that free thinking should not be removed from the management of WIL. Regarding the 100-day WIL requirement, participants stated that the completed 100 days and evidentiary documents should not be used as the sole indicator of competence to practice. They expressed feeling a sense of disarray regarding the requirements for recordingkeeping of WIL and a lack of direction from HPCSA. They said that sharing of suggestions and best practices among WIL coordinators and institutions does not take place, leaving them feeling overwhelmed and frustrated—and that their academic responsibilities were exacerbated by the demands of WIL coordination.

CHE Guidelines for WIL Practices

CHE is an independent statutory body that was established by the Higher Education Act of 1997. CHE (2011) advises the Minister of Education and Training on all higher education issues and is responsible for quality assurance and promotion through the Higher Education Quality Committee.

CHE developed guidelines published in *Work-Integrated Learning: A Guide for Higher Education Institutions* to assist in program and curriculum development as well as to encourage academics to think about WIL as a tool for teaching and learning (CHE, 2011). The purpose of the CHE guidelines is to help university teachers plan, implement, and manage good WIL practices. The guide offers a definition of WIL and the activities that constitute WIL, and the guidance has been adopted and incorporated into the WIL policy of many institutions of higher learning. The universities involved in this study all draw from the CHE guidelines, which state that workplace practice or WIL policy must be aligned with academic and workplace practices to benefit students and industries. According to CHE (2011), WIL can be achieved in three ways:

1. Learning for work, which entails training and inducting new candidates for a profession or vocation.

2. Learning at work, which involves acquiring knowledge and competencies from working experiences.
3. Learning through work, which involves assigning work-related tasks as part of the learning curriculum.

The activities mentioned by participants can be categorized in these three ways:

1. Learning for work: Virtual seminars, training, and guest lectures by industry specialists.
2. Learning at work: Placement of students in the workplace, field trips, and site visits.
3. Learning through work: Community surveys, inspections, data collection, and research.

The CHE (2011) guidelines state that a WIL activity must undergo a systematic and thorough development process. The guidelines also state that WIL curricula or the WIL component within a program must ensure that students integrate theoretical knowledge and practice so as to allow them to make the connection between university and the workplace. The activities should require knowledge of the discipline and application of workplace-relevant knowledge and skills. Professional practice should be the core of WIL. The guidelines also advise that placements should be in an authentic professional context in which students can learn and engage in meaningful workplace activities. The findings of this study suggest, however, that participating institutions might not completely conform to CHE guidelines when designing WIL activities.

According to CHE (2011), "Encouraging students to interpret and reflect on the experience of professional practice and how knowledge is transferred from the academic to workplace context (and vice versa) should be at the heart of learning activities for students in WIL curricula." Reflections are a good practice for students, which can be facilitated through briefing sessions before and after the WIL activity. Feedback from students and placement sites offers valuable insights that can improve and refine WIL activities and the WIL process.

All participants (100%) conducted a briefing session with the student prior to the WIL placement; however, only 80% of participants conducted a debriefing session with the student and a feedback session with the placement site after the WIL placement concluded.

The CHE (2011) guideline offers WIL coordinators and academics other avenues through which WIL can be achieved, such as problem-based learning (PBL). PBL is an interesting option for a discipline such as environmental health, which is foundational to community health. PBL can be incorporated into community projects or simulations of real-world problems where students can be instrumental in bringing about change. In this context, the "problems" rather than an academic module define the WIL activity (CHE, 2011).

Similarly, students could also be involved in WIL through project-based learning (PJBL). The academic or WIL coordinator can develop a project that is developed from a real-world work setting (CHE, 2011). PJBL can be done via engagement with employers and external partners (e.g., placement sites), which allows for the building of partnerships and future WIL placement opportunities. CHE also provides guidance on the most appropriate level of study for a WIL activity. For example, PJBL is recommended for third- and fourth-year students enrolled in a 4-year degree. The CHE guideline is a good practice guide that can offer valuable direction to WIL coordinators and might offer some relief from the additional WIL management burden.

International Environmental Health WIL Practice

The limited research published on higher education in environmental health is predominantly by Australian researchers. Universities Australia (2019) published a report that states Australia is committed to the development of graduates that are "flexible, adaptive, and able to apply their technical skills to real-world situations." Their plan is to increase support for employers so they can involve students in their organization. In doing so, employers increase and strengthen their links with universities through work placements and project work. Work placement is the most common type of WIL activity; however, Australian universities are moving beyond this traditional approach into opportunities such as projects, simulations, and fieldwork (Universities Australia, 2019). The gap in research in South Africa is an area of opportunity for South African universities that offer environmental health programs to contribute to the literature to foster the sharing of best practices.

Dunn et al. (2018) is the only published research in the field from South Africa and produced the foundational research used to provide the comparison between environmental health in South Africa and international sites (mostly Australia). The study by Dunn et al. evaluated the different WIL approaches used among the universities that offer environmental health programs in Australia after a change in the environmental health program accreditation policy in Australia. They explored the range of WIL activities used by Australian universities and the authentication of WIL activities. Universities had similar WIL practices (e.g., placement of students for a set period, the total number of WIL hours required of a student, the use of work and nonwork placements, the activities considered as nonwork placements). The findings by Dunn et al. were similar to the findings from this study.

Work placements for students were a primary avenue of WIL until 2014, when the Environmental Health Australia (2014) accreditation policy shifted WIL toward nonwork placements. The policy change recommended that students complete a work practice exposure of 6 weeks, which can include work placement. Nonwork placement options include workplace visits, PBL/PJBL work, investigative assignments, and laboratory activities.

Independent of the WIL activity, the aim is to provide the student with an authentic environment in which to use theoretical knowledge to build their practical knowledge and develop skills in a real or simulated work environment (Environmental Health Australia, 2014). It was found that best practices among Australian universities included supervision at the workplace by both an employee and an academic supervisor to monitor student progress and student reflections on their experiences.

Examples of WIL activities used in Australian universities include investigation of incidents, routine compliance visits, public health planning activities and health education, immunization programs, and disaster management planning and research (Dunn et al., 2018). As with the South African universities, site visits and industry guest speakers were also used as WIL activities. The manner in which WIL is incorporated into environmental health programs in Australian uni-

versities is also similar to programs in South Africa, whereby some universities have WIL as a credit-bearing module, whereas other universities have WIL embedded in modules or as a separate unit without credits allocated.

Australian universities face similar challenges as do their South African counterparts, such as a lack of placements, lack of employment opportunities for environmental health graduates, lack of provision of well-managed placements, and poor participation of students in work placement (Dunn et al., 2018). Dunn et al. argue that emphasis should shift away from a set WIL time requirement (i.e., 100 days) and instead move toward the components of learning and education of the WIL activities. Admittedly, time spent in a workplace environment might not prepare students for professional practice. Additionally, the placement experience could differ in the opportunity students find to develop higher-order thinking skills, which is an important skill set to factor into professional practice development.

Discussion

The findings of this study highlight the variations among university environmental health programs. The data offer a glimpse into the practice of WIL within different WIL programs. Although there are similarities (e.g., the type of nonwork placement activities used by universities, recordkeeping procedures, supervision of students, conducting of briefing sessions), there are also major contrasting findings. WIL is incorporated into programs using different modalities. Some universities have WIL as a credit-bearing module, whereas some universities incorporate it into modules or depend solely on placements.

There are benefits to a WIL program that is formally integrated into the curriculum. WIL as a credit-bearing module allocates a "weight" to the activity that is otherwise not present, as in instances of WIL being integrated into one-off activities within academic content modules. Credit-bearing activities generally are allocated designated time in the academic schedule. This structure allows the WIL component to have designated student time and resources, which assists in the coordination process. Universities should consider revising programs to include WIL as a credit-bearing module to alleviate the challenges of time constraints.

A combination of work placement and nonwork placement WIL activities was noted by all participants. While all institutions have adopted nonwork placement activities, there is a lack of standardized criteria used to determine if the activity can be considered for WIL. A criterion that can be applied across all environmental health WIL programs would assist coordinators and academic staff to ensure that the activity fulfills the objectives of WIL.

One factor mentioned by Kaider et al. (2017) is that nonwork placement WIL activities should allow students the opportunity to apply their "disciplinary learning to work-based and professional scenarios." Assessment practice, however, is not common across participating institutions. Not all programs assess WIL activities or have predetermined objectives to which WIL activities should comply. Perhaps WIL coordinators should explore the nontraditional sense of assessment. Kaider et al. explain that placements are a "natural home for authentic assessments." Assessment methods can include class assessments linked to embedded WIL activities or assessments in the work placement.

Independent of the means of assessment, the CHE (2011) guidelines suggest that the curriculum should be aligned with WIL in a way that ensures outcomes, pedagogy, and aligned assessments. An environmental health-specific WIL policy or guideline would be especially beneficial to offer a framework for the development of assessments.

The accrediting professional organization plays a vital role in the WIL process. They are tasked with ensuring that the environmental health graduate has accumulated the required WIL hours to complete their degree; however, the quality of the WIL components is equally important as the quantity. To this point, participating WIL coordinators suggested that the WIL requirements need to be revised.

Because institutions experience unique challenges regarding placement options or access to specific industries for placement based on the university's geographical location, WIL coordinators suggested that institutions should be viewed individually. More importantly, they advised that the measure of competence for graduates via WIL activities should be reviewed. The 100-day requirement and proof of activities completed during a 4-year degree might not constitute a competent graduate who is employable and ready to work.

Drawing from Australian practice, the acceptability of the WIL activity should be determined by more than the number of hours of the WIL activity. Kaider et al. (2017) suggest that WIL activity should be considered according to the proximity and authenticity of the activity and not the mere classification of WIL types. This classification evaluates the degree to which the activity is proximal to the workplace or practitioner to be considered as an authentic activity that resembles professional practice.

Limitations

There are seven institutions that offer environmental health studies in South Africa that were therefore potential participants in this study. The responses from this study represent five out of seven universities. This number might still be a reasonable representation of the research focus area and can provide an understanding and generalized findings for the WIL coordination for environmental health programs in South Africa. Due to time and resource constraints, this study could not delve deeper into the SOPs or details of the WIL processes used by each university. These aspects represent an opportunity for future research.

Conclusion

A revised framework is needed to consider the outcomes of the WIL activity to deem it appropriate. Environmental health programs in South African universities lack such a framework or guideline, and it is important that WIL policies be aligned with academic and workplace practices that mutually benefit the student and industry (CHE, 2011). CHE also recommends that the South African higher education community consult with international partners in the development of curricula and innovative practices as well as engage with WIL specialists. Variations of WIL management included activities of best practice that can assist other WIL coordinators in the management of their programs.

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