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Examining a student perspective of utilizing a remote work-integrated learning approach for course delivery: A case study of the University of Guyana-Riipen Partnership

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Abstract

Globally, work-integrated learning (WIL) is becoming an increasingly popular educational approach. However, instructors, employers, and students face challenges when utilizing this strategy. This study aimed to explore students' perspectives on using a remote WIL approach during course delivery. The study was guided by a conceptual model implemented during the operationalization of the Applied Project course at the University of Guyana. A total of 48 students participated in the study. Data were collected through online surveys consisting of Likert-scale and open-ended response-style questions. In terms of benefits, the WIL approach was generally perceived by students as helpful in enhancing their confidence, course participation, and professional development. However, students also reported several challenges, including issues with project commitment and feedback from employers, group dynamics, and project scoping. The study concludes with recommendations for improving the WIL approach.

Keywords: Work-integrated learning, remote, challenges, benefits, students

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1. Introduction

Over the past two decades, global access to tertiary education has expanded significantly (Clicque, 2021). This growth has enabled a larger number of individuals, particularly those who historically faced barriers to education, to pursue higher levels of learning. In Latin America and the Caribbean, for instance, enrolment in tertiary-level programmes has doubled within the last decade (World Bank, 2021). This surge in tertiary education participation can be attributed to its compelling economic and non-economic advantages (Schendel et al., 2017). Graduates of tertiary institutions are not only more employable and productive (World Bank, 2021), but also enjoy higher earning potential (World Bank, 2021; Schendel et al., 2017) and greater resilience to economic shocks (World Bank, 2021). Beyond individual benefits, tertiary education plays a crucial role in fostering societal development by equipping graduates to actively contribute to their communities. Graduates often exhibit higher levels of civic engagement, adopt healthier lifestyles, and demonstrate greater environmental consciousness (World Bank, 2021; Schendel et al., 2017).

Despite the expanded access and proven benefits, many graduates still lack the locally relevant skills needed to seamlessly transition into the labour market (World Bank, 2021). This skills gap is exacerbated by differing perceptions among key stakeholders. While 96% of chief academic officers in United States (U.S.) tertiary institutions believe their programmes effectively prepare students for the workforce (Gallup-Strada, 2017), only 33% of business leaders agree (Gallup and Lumina Foundation, 2014). Similarly, just one-third of college and university students feel confident they will graduate with the knowledge and skills necessary for success in the workplace (Strada-Gallup, 2017). These divergent perspectives underscore the pressing need for stronger collaboration between academia and industry to bridge the gap in workforce readiness. Interestingly, although only 18% of American business leaders report a high level of engagement with academia, the majority express a willingness to form active partnerships (Gallup and Lumina Foundation, 2014).

A common strategy for fostering such partnerships is work-integrated learning (WIL), which provides students with opportunities to apply their academic knowledge in real-world settings. WIL immerses students in authentic work environments, enabling them to hone their skills and gain valuable experience (Jackson, 2015). Examples of WIL include internships (Gibson et al., 2002), job placements (Reeders, 2000), fieldwork (Allison & Turpin,

2004), sandwich year degrees (Bullock et al., 2009), job shadowing (Gibson et al., 2002), cooperative education (Reeders, 2000), and community service initiatives (Ide & Thomas, 2011). To ensure successful partnerships, Mirza et al. (2014) emphasize the importance of close coordination among stakeholders, effective management of internships, regular updates to industry-relevant curricula, and specialized training programmes to enhance workforce readiness. While WIL programmes have traditionally been conducted in face-to-face settings, the transition to remote modalities has introduced several advantages, including increased flexibility, creativity, mobility, and the ability to accommodate more placements without the constraints of physical office space (BEST Educational Committee, 2013). To maximize the effectiveness of remote WIL, Jeske (2019) recommends careful planning, consistent online communication, clear expectations, appropriate compensation for interns, alignment with institutional diversity initiatives, and the provision of meaningful learning experiences by employers.

Recognizing the importance of improving undergraduate workforce readiness, the Computer Science (CS) Department at the University of Guyana (UG) overhauled its curriculum in 2015/2016 to integrate more real-world projects and work-integrated learning (WIL) opportunities. A notable initiative is the 'Applied Project' course, where final-year Bachelor of Science students collaborate with peers and industry partners to tackle practical, real-world projects. Initially conducted in person and focused on local companies, the course shifted to a remote format during the COVID-19 pandemic to ensure the safety of all stakeholders. Additionally, the rapid increase in student enrolment necessitated the continuation of the course in a remote format to accommodate demand effectively. To enhance coordination and streamline collaboration, the department adopted the Riipen experiential learning platform, which has facilitated partnerships with primarily international companies. This platform has significantly expanded opportunities for students, providing them with access to diverse projects and a broader professional network. While a few other programmes at UG have introduced WIL components, there are no published studies exploring the experiences and outcomes of running WIL initiatives in Guyana.

This paper addresses this gap by presenting a model for implementing remote work-integrated learning in higher education and examining students' perspectives on its application for undergraduate course delivery. The primary research question driving this study is: '*What are the experiences of students collaborating with peers on remote work-integrated learning projects?*' The paper begins with a review of the existing literature on the benefits and best practices of work-integrated learning from a student-centric perspective. It then details the study's WIL model, data collection methods, and analysis approaches. Finally, the key findings from the study are presented and discussed, providing valuable insights into the implementation of remote WIL in higher education.

2. Literature Review

2.1 Overview of Work-Integrated Learning

Work-integrated learning (WIL) is an umbrella term for a range of approaches and strategies that facilitate the integration of theory and work practice within a purposefully designed curriculum (Govender & Wait, 2017; Prinsley & Baranyai, 2015; Patrick et al., 2008). Acknowledged and validated as a means of ensuring authentic learning scenarios, students have the opportunity to implement theoretical concepts in a practical setting (Ferns & Zegwaard, 2014; Billett & Choy, 2009).

Partnering students with non-profit, educational and civic entities requiring specialized deliverables and professional conduct, mimics real-world business scenarios that necessitate professionalism. Typically, industry projects encompass a wide array of skill sets - everything from time management and team collaboration to oral and presentation skills as well as the technology and processes utilized within the field (Jackson, 2015). By immersing students in real-world scenarios driven by real clients and projects through the WIL approach, a direct correlation is made between the theory and its application to industry. Moreover, it is increasingly understood that WIL opportunities are critical in providing students with employability skills that allow them to gain employment and effectively operate in work environments (Fassbender, Taylor, and Houtmeyers, 2012; Jackson, 2013)

Literature within the field shows that the value emanating from WIL can be examined through three general perspectives: student, university, employer. However, for the purpose of this paper, only the student perspective was considered.

2.2 The Value of Work-Integrated Learning for Students

One of the growing challenges for universities in the 21st century is producing industry-ready graduates. This

challenge is exacerbated by the way in which technology continues to affect the demand for jobs and skills within industry. Combining WIL with an academic course caters to this evolving change in demand by preparing students for industry work in several ways. These include, inter alia, enhancing students' confidence in work situations, enhancing their ability to function in teams and developing work experience and skills. As added incentives, students can gain feedback on their performance, effectively track their learning outcomes via e-portfolios and receive academic and/or non-academic rewards. Reddan (2016) demonstrated the role of WIL by integrating work placement opportunities within a university-level course. This proved to be instrumental in developing students' confidence and self-efficacy in working on real-world projects, which are of vital importance to long-term workplace performance in contemporary organizations. Abery et al. (2015) concurred that WIL enabled students to acquire confidence and attain the ability to self-reflect on whether they contributed to improved workplace productivity.

Confidence and self-efficacy can be attributed to how WIL programmes expose participants to greater academic and professional competencies. In such programmes, students apply their knowledge to professional settings, interpret relevant data for decision making and even oversee a business situation (Casado-Aranda et al., 2021). Therefore, it is recognized that the WIL approach not only supports the pedagogical foundation of a course but also promotes career development learning activities. In many cases, such activities redound to students' motivation to participate in a course. Both Casado-Aranda et al. (2021) and Khampirat (2019) show that the application of WIL and active learning techniques fostered the development of greater interest in and enjoyment of the course content among students. These benefits could extend to long-term academic, affective and knowledge application improvements to the professional world (Casado-Aranda et al., 2021).

In examining the processes that impact students' readiness for entrepreneurial careers, Winborg and Hägg (2008) established that WIL, in addition to enhancing motivation to participate, creates a context for students to collaborate with others and function as a team. Developing team skills implies that students must be open to accepting insights from others as well as sharing insights. Calvin and Kate (2015) attribute this ability of giving and accepting feedback to mature self-awareness which stems from the experiences of working closely with other individuals. Apart from developing team-based skills, students via the WIL experience are extensively exposed to situations in which skills development can occur. It is established in the literature that a university's knowledge-based agenda and the attributes employers look for in graduates are not always aligned. Therefore, authors such as Doolan et al. (2019) and Peach et al. (2014) argue that through WIL, this gap can be narrowed by allowing employers to be involved in both the design and delivery of higher education. Specifically focusing on the impact of WIL on employability skill development, Jackson (2015) posits that tangible improvements in employability skills such as professionalism, critical thinking, problem solving, technology usage and self-management are observed after students have participated in WIL opportunities. However, attention remains predominantly outcomes-focused with less attention to the process of what, how and from whom students acquire skills during placements (Coll et al. 2009; Hu et al.2009).

Nevertheless, Abery et al. (2015) argues that highly motivated students who are exposed to work placements and the internal operations of organisations ultimately feel more prepared for industry and can adapt to different workplace environments. This work experience factor which includes inter alia interfacing with the management of an organisation, provides invaluable industry context to the students, which in turn shapes their attitudes and mindsets (Khampirat et al., 2019). Therefore, the utility of a WIL is high given the students' exposure to work realities, which can impact their future employability prospects. This justifies the need for academic practitioners to ensure that their WIL programmes incorporate authentic workplace learning activities aligned with academic learning objectives (Jackson, 2015).

WIL experiences also allow students to work closely with supervisors (e.g., in the workplace and academia) as they complete project tasks. The feedback offered by supervisors can prove to be critical in assessing students' performance and validating their skills (Khampirat et al., 2019; Peach et al., 2014). Feedback is especially valuable to the learning process since students can become more aware of their strengths as well as the areas that they need to improve. Furthermore, quality feedback that offers clear direction can encourage increased effort on the part of the student (Shute, 2008). With respect to feedback in the workplace and the role of supervisors, Peach et al. (2014) recommend that WIL experience can be enhanced by ensuring the participation of workplace supervisors, improving feedback processes and tools (e.g., including realistic measures), increasing the frequency of supervisory feedback, and improving work and learning plans.

To effectively track learning outcomes during WIL programmes, students may be required to maintain an e-portfolio (e.g., project artifacts, CVs, multimedia, etc.) (Koch, 2010; Hodgson, 2007). These serve as an enabler for WIL initiatives by supporting the process of maintaining, accessing and assessing students' deliverables

(Koch, 2010). According to Montgomery and Wiley (2008, p.8), "A quality portfolio demonstrates complex thinking and problem-solving and invokes authentic applications that represent significant learning". Moreover, e-portfolios can capture students' professional experience during and even after work placement, which in turn can be accessed by various individuals (e.g., academic staff, workplace supervisors, students, employers) for learning, assessment and employment purposes (Koch, 2010). Furthermore, students view the maintenance of an e-portfolio positively and felt that it simplifies the process of completing and submitting their records and facilitates immediate access to WIL-related assessment results.

Academic and non-academic rewards are common incentives that are afforded to students via WIL placements. For instance, students appreciate rewards such as course credits (García-Peñalvo et al., 2015), and digital badges which could further be posted on professional networks such as LinkedIn or referenced on their résumé (Piedra, 2021). They also believe that the prominence of the company or foundation they are attached to can be a launching pad in their professional career (García-Peñalvo et al., 2015). Moreover, a powerful motivational aspect is the potential to be hired by the company where they are located. As an added incentive, some WIL placements offer monetary compensation to students, which varies according to the cost of living at the location (e.g., housing, amenities, computer devices and electricity for remote modalities, etc.) (Pittenger, 2021). Although no guidance was uncovered in the literature on whether remote placements should offer the same or higher compensation than the face-to-face modality (Pittenger, 2021), researchers argue that monetary payment is an essential component (Eaton, 2018) and the value must be fair (Pittenger, 2018). Regardless of the type of reward, the WIL experience should provide interesting returns for students' time and effort, with an advantage on their specific academic programme (e.g. diploma, degree, masters).

Building on past literature, this research seeks to examine the experiences of students collaborating on remote work-integrated learning projects. More specifically, the research aims to ascertain how benefits and challenges faced by the students under the paradigm of a work-integrated learning approach to the learning environment. This direction will provide valuable insight into the implementation of remote WIL in the higher education space.

3. Research Model

This study was centered on a proposed model that was implemented during the operationalization of the Applied Project course at the University of Guyana. The model consisted of four key stakeholders which occupy roles in the course: 1) Students, 2) Department, 3) Employers and 3) Riipen.

The "department" role represented the instructors that facilitated the course's execution. The "students" were the stakeholders that undertake real-world systems development projects that were designed by the "employer" stakeholders. The final stakeholder named "Riipen" which is a third-party experiential learning service provider, occupied the roles of the operating ecosystem and interlocutor among the department instructors, students and employers.

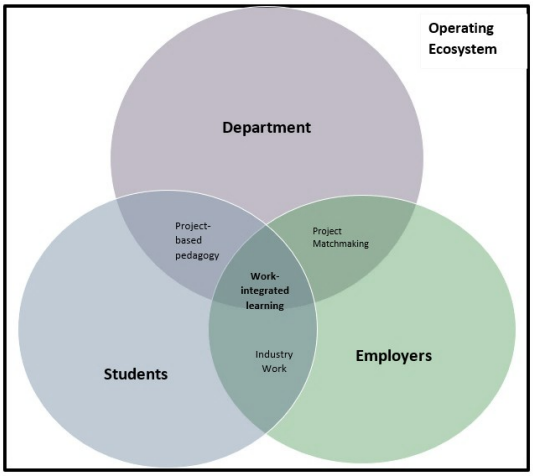

Figure 1. Work integrated learning model of stakeholders and interactions among same

These outcomes are described below and find support in literature within the field of work-integrated learning:

- Work-integrated learning: an outcome which originated based on the interactions among the department, students and employers. This interaction aimed to expose graduands to the world of work and assess their experiential learning through a combination of academic and work-related activities
- Project-based pedagogy: an outcome resulting from the interaction between departmental instructors and students taking the course. The end goal involved the establishment of a dynamic classroom environment where students acquired deeper knowledge through active inquiry into a real-world challenge with the end goal of deriving a tangible solution that addressed the challenge
- Project Matchmaking: an outcome created by interactions between the department and employers. This entailed aligning employment opportunities of employers with course-based assessments of educators of courses of the University
- Industry Work: an outcome based on the interactions between students and employers. The end goal entailed connecting students undertaking the course with the real-world employers' projects met company goals
- Operating Ecosystem: indicative of Riipen's technological platform connects students with industry partners through in-course assignments designed by instructors

The proposed conceptual model was evaluated to determine the views of each stakeholders' perspectives towards the utility and use of the work-integrated learning approach in the delivery of the Applied Project course at the University of Guyana. However, for this leg of the academic research, this study focused primarily on the student stakeholders undertaking the Applied Project course at the University of Guyana.

4. Methodology

4.1 Research Design

This research adopted a pragmatist philosophical approach to allow the researchers to have a pluralistic stance of gathering multiple datasets to best address the research objective (Creswell & Clark, 2011). A pragmatist employs a mixed-methods design which consists of qualitative and quantitative components. The qualitative part helps to understand subjective circumstances through exploratory tools like participant interviews, whereas the quantitative one derives objective findings using tools like a survey (Maxwell, 2016).

4.2 Case Study: The University of Guyana – Applied Project Course and Riipen

This research employed a case study approach focused on investigating a work-integrated learning approach that was used during the execution of the Applied Project course at the University of Guyana. The case-study approach was chosen because it allowed for detailed exploration of the dynamics of a situation in its naturalistic context (Yin, 2014; Huberman and Miles, 2002). In this case, the context under examination was the work-integrated learning approach deployed for the course in partnership with Riipen.

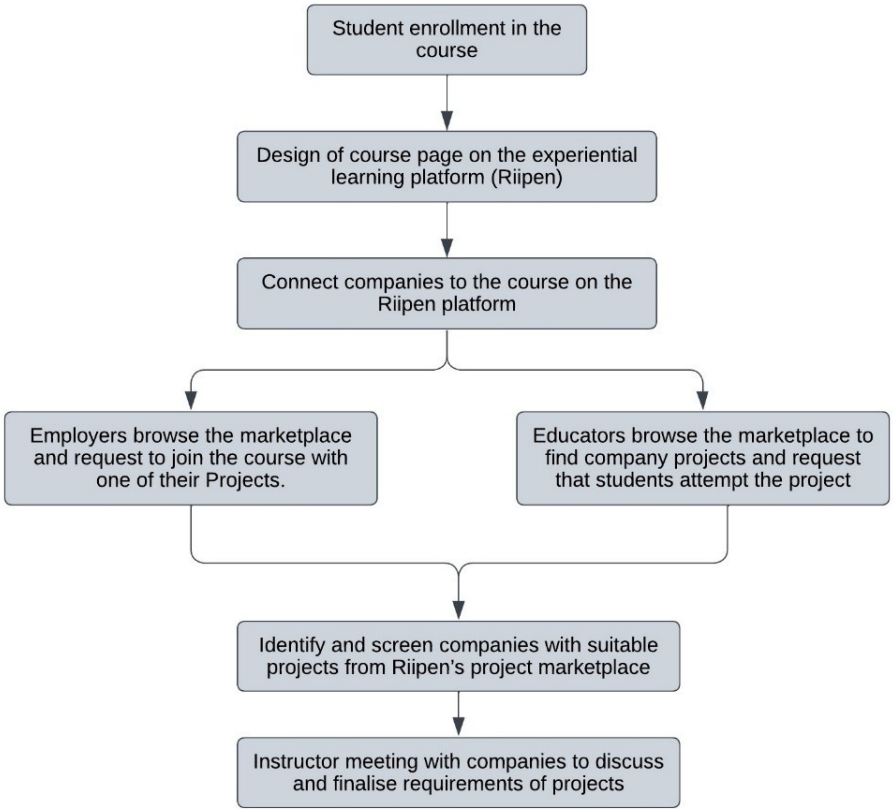

Figure 2. Pre-course commencement activities for the Applied Project Course

The Applied Project course requires students to use their hard and soft skills to devise and execute a systems development plan which will entail requirements in engineering, software development and project management towards the development and implementation of a functional software system for an organization. The execution of the course can be summarized into the two general phases: Pre-course commencement (see Figure 2) and post-course commencement (see Figure 3). The pre-course commencement phase encompasses the activities that instructors undertake prior to the operationalization of the course. These activities occur approximately two to three weeks before the commencement of the semester. Figure 2 illustrates the sequence of activities in pre-course commencement phase. The post-course commencement phase covers the activities from the point where a student team is formed to the point where all project deliverables are submitted to the clients and the project is deemed closed. Figure 3 illustrates the sequence of activities in the post-course commencement phase.

Riipen is an online platform that connects students with real-world project experiences by partnering with educational institutions and organizations. It facilitates experiential learning by allowing students to work on industry-relevant projects, thereby gaining practical skills and knowledge. The platform allows universities to integrate real-world projects into coursework. Given that it focuses on bridging the gap between academic learning and real-world application, Riipen was found to be a suitable partner to achieve the learning outcomes of the Applied Project course.

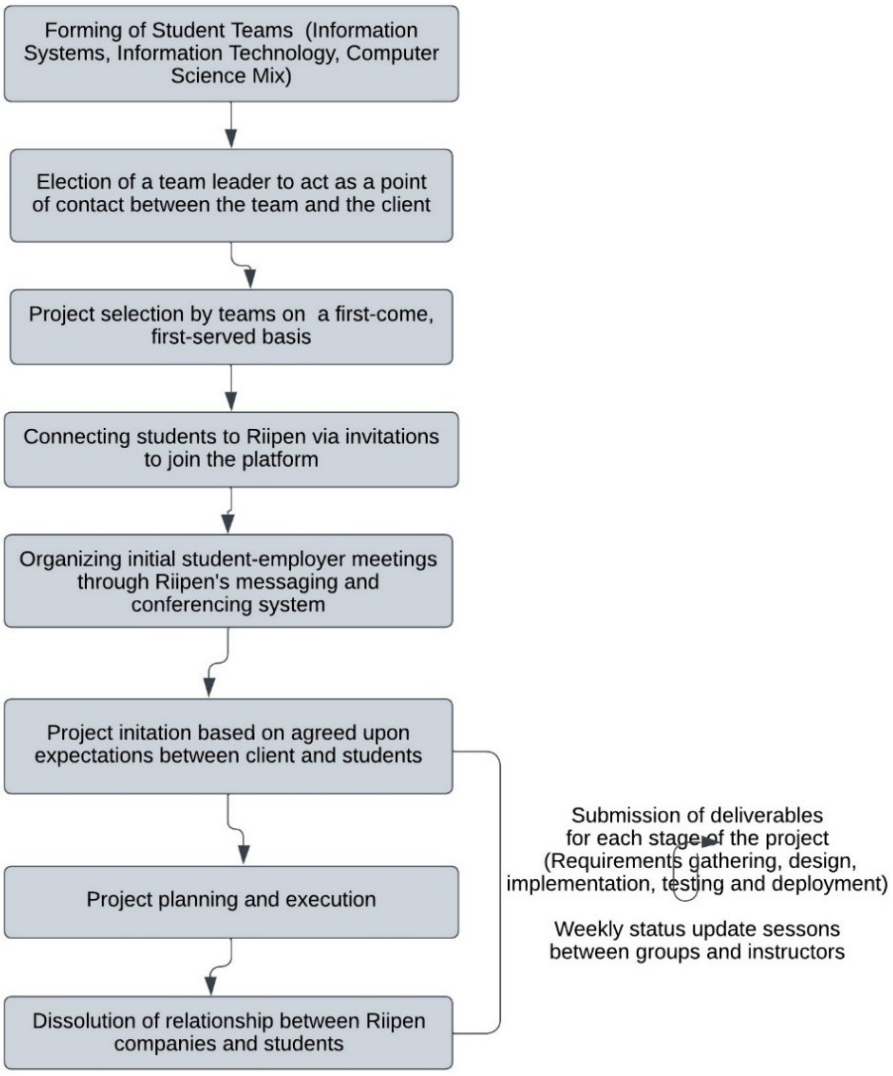

Figure 3. Post-course commencement activities for the Applied Project Course

4.3 Data Collection

This study aimed to determine a student perspective of utilizing a remote WIL approach for course delivery. The convenience sampling method was utilized because the participants provided voluntary consent to participate in this research. The identity of the participants was also kept confidential to protect their privacy.

Out of a class of 80 students, 48 students participated in the study. Eighteen (18) of the participants were females, and 30 were males. Furthermore, 27 of the participants were Computer Science majors, whereas 14 and 7 were Information Technology and Information Systems majors respectively. All students were enrolled in the Applied Project course at the University of Guyana. Data collection was conducted via an online survey. The survey instrument was designed to capture data on the students' perspectives of remote WIL, with specific emphasis on benefits, challenges and recommendations. The survey questions were derived and validated from previous

studies on successes and failures of WIL approaches employed by other tertiary-level institutions. The survey included a mixture of 5-point Likert scale ratings ('Strongly Disagree', 'Disagree', 'Neither Agree nor Disagree', 'Agree', 'Strongly Agree') and open-ended questions. It was broken down into the following broad sections: 'Background information', 'General rating questions', 'Reward systems', and 'Overall perspective'.

A pilot test was performed among 21 students to ensure no typographical errors were present and that the measurement instrument was easy to comprehend. Minor changes were made to the survey questions based on the feedback from the pilot test.

4.4 Data Analysis

The study utilized two forms of data analysis based on the data collected. Firstly, quantitative analysis was done for the general rating questions. In particular, descriptive analyses of the 5-point Likert Scale datasets obtained from the student stakeholders to determine the benefits of the WIL approach. Secondly, qualitative data analysis was gathered from the open-ended response style questions and was categorized and analyzed using Braun and Clarke's (2006) principles of thematic analysis. The thematic analysis focused predominantly on determining the challenges and recommendations of the WIL approach for the students. Since this research attempts to fill a knowledge gap that has not been previously attempted in a Guyanese context, the thematic analysis approach through its theoretical freedom, provided a flexible and useful way to provide a rich and detailed account for the data (Marks & Yardley, 2004).

4.5 Ethical Considerations

Ethical considerations were made before, during and after data collection in this research. This research was exempted from ethics approval by the University of Guyana's ethics review board since it posed minimal risk to participants and did not involve the collection of any sensitive or private information. Participation in this research was entirely voluntary. Participants who indicated their willingness to participate were assured that their data and feedback would be kept confidential and anonymized for data analysis and reporting. Regarding data handling, the data collected was placed in secure storage and made accessible to only the researchers on the project.

5. Findings and Discussion

The findings from this student are presented and discussed in following three sub-sections:

- Descriptive Analysis of Benefits of WIL Approach
- Thematic Analysis of Challenges to WIL Approach
- Thematic Analysis of Recommendations to WIL Approach

5.1 Descriptive Analysis of Benefits of WIL Approach

The data revealed that approximately 75% of the participants agreed that the WIL approach enhanced their confidence in working on real-world projects (see Figure 4). This finding aligns with those of Reddan (2016) and Abery et al. (2015), who claimed that work-integrated learning aids in developing students' self-confidence and work self-efficacy by working on real-world projects. These benefits redound to long-term workplace performance in contemporary organizations. That data further showed that 72% of the participants agreed that WIL improved their participation in the course (see Figure 4). This finding is consistent with the works of Casado-Aranda et al. (2021) and Khampirat (2019) who showed that work-integrated learning fosters the development of greater interest in and enjoyment of the course content among students since it promotes career development learning activities.

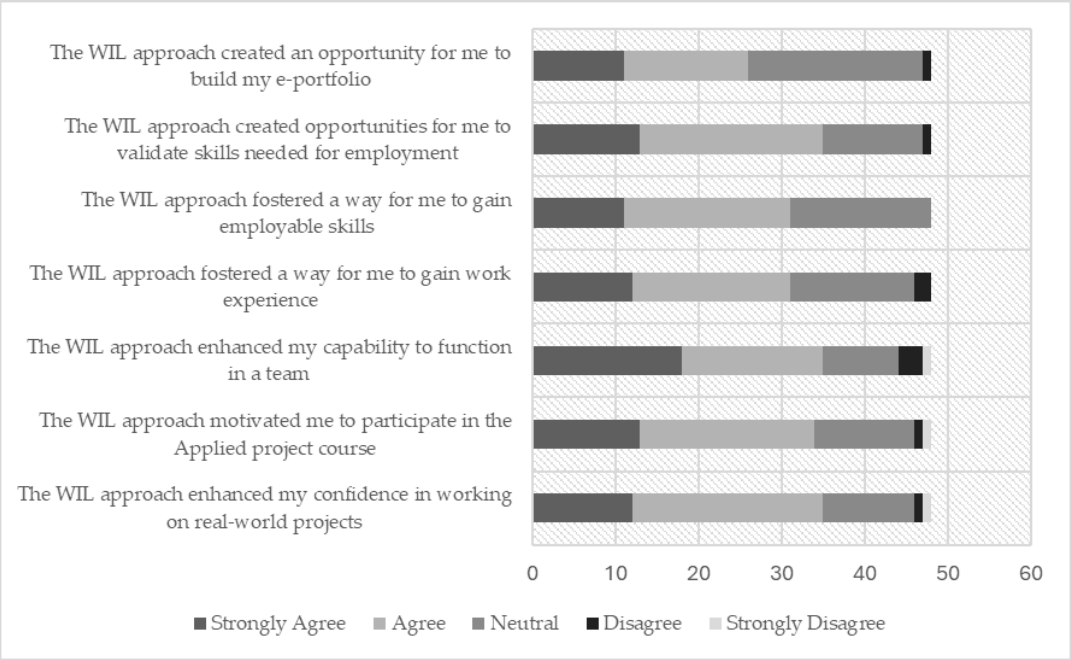

Figure 4. Course Column graph showing the benefits of WIL from the Students' Perspective

Approximately 75% of the participants indicated that the WIL approach improved their capability to function as a team (see Figure 4). Winborg and Hägg (2022) explain this by positing that work-integrated learning creates a context for students to collaborate with others and function as a team. Calvin and Kate (2015) further highlight that the experiences of working closely with other individuals warrant the need for students to accept feedback and insights from others. The data showed that 65% of the participants claimed that the WIL approach provided a way for them to gain work experience and employable skills (see Figure 4.0). This finding connects with those of Fassbender, Taylor, and Houtmeyers (2012) and Jackson (2013) who found that WIL opportunities provide scope for students to improve skills in the areas of professionalism, critical thinking, problem-solving, technology usage and self-management. This justifies the need for academic practitioners to ensure that their WIL programmes incorporate authentic workplace learning activities aligned to learning objectives (Jackson, 2015). The findings presented by Patrick et al. (2008) show that workplace experience can also result in the development of non–field-specific individual skills and knowledge among students. Patrick et al. (2008) further argue that generic non-field skills include team, communication, problem-solving, and networking skills.

The data revealed that 72% of the students indicated that the WIL approach created opportunities to validate skills needed for employment and avenues to learn from employers in industry (see Figure 4). These findings are consistent with those of Khampirat et al. (2019) and Peach et al. (2014), who explain that WIL experiences provide students the opportunity to work closely with supervisors (e.g., in the workplace and academia) as they complete project tasks. The feedback offered by supervisors can prove to be critical in assessing students' performance and validating their skills. Peach et al. (2014) recommended that WIL experiences can be enhanced by ensuring the participation of workplace supervisors, improving feedback processes and tools (e.g., realistic measures), increasing the frequency of supervisory feedback, and improving work and learning plans. Similar to those of Patrick et al. (2008), the findings in this study show that through participation in the project, students gain experience and knowledge about the working environment and how established companies operate.

Lastly, more than half of the participants believe that the WIL approach contributed to the development of their e-portfolio (see Figure 3.0). Koch (2010) explains that WIL programmes serve as an enabler for work-integrated learning initiatives by supporting the process of maintaining, accessing and assessing students' artifacts. Students view the maintenance of an e-portfolio positively and felt that it simplified the process of completing and submitting their records and gaining the buy-in of prospective employers (Koch, 2010).

5.2 Thematic Analysis of the Challenges to WIL Approach

Thematic analysis was performed on the data related to the students' challenges faced in the WIL approach. Five

(5) major themes were derived namely poor project commitment, limited project feedback, volatile project scoping, group preparedness and dynamics and work-life balance and motivation.

5.2.1 Theme 1: Poor Project Commitment

This theme highlights a major challenge when interacting with employers on the Riipen platform. More specifically, the theme captures the employers' poor commitment towards the oversight and completion of student projects. It is one of the most commented-on areas by the student participants in the research. The data demonstrated employers' ignorance of their obligations to students for the duration of the course. Participant P08 reported, "*Once some employers learned that students would not be able to produce a working prototype they left, forcing them to seek another employer just to get a project to work on just to pass this course.*" This finding aligns with the work of Smith et al. (2006) who posited that often there are significant differences in expectations of the work-integrated learning approach between university instructors and employers. Smith et al. (2006) showed that the differences exist in terms of the level of commitment of employers to WIL activities, their understanding of what WIL involves and their capacity to undertake their roles effectively.

Several participants revealed that employers had multiple student groups from different universities working on their local company project. This meant that numerous student groups from global Universities were simultaneously, but independently working on same project. Consequently, when one of those groups met the requirements of the employer, then there was an intentional walk out of the employer before the course ended for another group of students. A participant mentioned, *"…coming down to the end the client simply disappeared I presume due to them achieving what they sought from somewhere else*" (Participant, P25). This finding was found to be indigenous to this study.

5.2.2 Theme 2: Limited project feedback

This theme represents the issue of limited and sometimes inadequate feedback that student groups received as they worked with employers on their respective company projects. It was another frequently commented-on area by the participants in the study. Venville et al. (2021) explains this finding by positing that while institutions may have internal mechanisms to gather feedback from external partners, the feedback process often tends to be ad hoc. Comments from students included, "*Communication with the CEO of the company wasn't consistent and the changes/updates they wanted varied*" (Participant, P19). Therefore, stringent methods of providing feedback by employers have to be put in place to alleviate this issue. It was found that the issue of poor feedback was compounded by the difference in time zones between employers and students. The difference in time zones resulted in challenges in establishing mutually agreeable meeting times. One participant yielded, "*Communicating with the client was somewhat difficult especially when you are living in a different country that doesn't have the same time zone*" (Participant, P15). Morrison-Smith and Ruiz (2020) posit that the differences in time zones and temporal discontinuities result in collaborators developing different perceptions of time.

5.2.3 Theme 3: Volatile project scoping

This theme captures the issues of magnitude and complexity of projects on the Riipen platform. Firstly, student respondents indicated that they experienced scope creep due to changing requirements of projects by employers. This aligns with the findings of Awais et al., (2017), who stated that initially elicited requirements change as projects proceed because clients do not realise what they require. In such cases, clients may also request requirements that their organisations do not necessarily need. The data in this study revealed three frequently occurring issues: 1) Employers being unsure of their requirements, 2) Changing requirements of employers and 3) Employers going beyond the expectations initially agreed upon. Participant P24 mentioned, "*There were some issues when interacting with the clients particularly in cases where they were not sure on what they want*." Awais et al. (2017) corroborates these findings by positing that requirements gathering is not deterministic. A client is not always clear on the requirements needed to fulfill a business need; consequently, the elicited requirements change as projects proceed. Therefore, it is clear why the recommendation of stricter stipulations for clients emerged from the data. Participant P16 mentioned, "*Have stricter stipulations for client detailing what is allowed and what is not allowed. Some clients expand the project*".

Secondly, it was revealed that some students perceived their projects to be overly complex and unattainable within the duration of the course. This can be attributed to an inadequate negotiation process of requirements during requirements solicitation between students and employers. One participant mentioned, "*Some of the projects being undertaken can't be done to the best of the students' abilities within the set timeline*" (Participant, P20). Awais et al. (2017) posits that if limited time is spent on requirements elicitation, then systems

development planning and execution goals can become obfuscated.

5.2.4 Theme 4: Group Preparedness and Dynamics

This theme highlights challenges related to the preparedness and behaviour of student groups. A significant concern was the lack of technical programming skills among some group members. Participant P12 reported, "*As a student you need great knowledge of the technology before building the project since you can fail the course without any prior programming knowledge or if your members of the group are not technically skilled you can fail*." Given that the nature of the work was related to software development, there was a possibility that students adopted technologies preferred by the employers. This could have resulted in a lack of necessary technical skills among students and a significant amount of time needed for them to become acquainted with the technology. This finding contrasts with the work of Winborg & Hägg (2022), who assert that students placed in work positions typically develop the confidence to handle uncertainty and unfamiliar situations.

To a lesser extent, some student groups also faced issues related to recalcitrant behaviour, which emerged from poor team participation. Participants highlighted the reluctance of certain members to engage and contribute to group activities, which negatively impacted the completion of their projects. Participant P12 mentioned, "*One of the major issues I faced was an unwillingness [of members] to learn and participate in group activities that were required for the completion of this applied project."*

This lack of engagement from team members posed significant challenges to the overall success and collaborative nature of the projects, undermining the effectiveness of group work and the learning experience. To address these issues, it is recommended that the course incorporate strategies such as strategic team-building exercises, peer evaluations, and clearer expectations for participation to foster better team dynamics and accountability. Additionally, workshops on effective teamwork and conflict resolution could equip students with the necessary skills to manage and mitigate these challenges, enhancing the overall success and collaborative nature of their projects.

5.2.5 Theme 5: Work-life Balance and Motivation

This theme captures challenges faced by the students in two key areas: personal affairs and student motivators. Regarding personal affairs, respondents highlighted difficulties in managing conflicting work schedules and achieving a work-school balance, particularly for those with jobs. Participant P36 reported, *"One of the main challenges for us as a group was, all of us meeting together to discuss topics that need to be addressed. This can certainly be attributed to our varying work schedule."*

To address these challenges, it is recommended to provide early advisement prior to the start of the course regarding the commitments required. This will ensure that students are fully aware of their responsibilities and can plan accordingly. In addition, offering additional support through workshops or mentorship can help students better manage their work and school commitments, thereby enhancing group collaboration and participation.

Regarding student motivators, it became evident that some students felt insufficiently incentivized to engage in Riipen projects. Apart from course credits and future career benefits, respondents suggested that the course should offer a variety of incentives to motivate student participation. For example, one participant recommended, "*Ensure a list of incentives are available to students"* (Participant, P09), while another advised, "*...help to incentivize and motivate persons to work on the project*" (Participant, P27). Addressing these issues could significantly enhance both participation and engagement in project-based learning activities. To incentivize student involvement, a diverse range of rewards could be offered, including tangible incentives like gift cards, vouchers, or modest monetary stipends, alongside intangible benefits such as recognition, certificates, or networking opportunities. Clear communication about the available incentives and their eligibility criteria is essential to maximize student engagement and ensure transparency in the incentive program.

5.3 Thematic Analysis of the Recommendations to WIL Approach

Thematic analysis was performed based on the data pertaining to the students' recommendations for improving the work-integrated learning approach. Five (5) major themes were derived namely inclusion of local employers, enhanced project screening, stricter stipulations for clients, attractive reward systems and technical support.

5.3.1 Theme 1: Inclusion of Local Employers

This theme highlights a commonly reported recommendation among the student respondents regarding the inclusion of projects from both the Guyanese public and private sectors in the work-integrated learning approach.

Participants emphasized that involving local employers would facilitate more in-person interactions, foster local networking opportunities, and potentially lead to job opportunities post-graduation. This emphasis on career opportunities aligns with findings from similar studies (García-Peñalvo et al., 2015), which highlight the benefits of WIL initiatives in enhancing employment prospects.

Moreover, the respondents believed that this inclusion would contribute significantly to the development of both the public and private sectors within Guyana. Participant P10 expressed:

> *"It would be interesting for the WIL approach to focus more on local businesses in Guyana where students can contribute to the development of technology in their country and have face to face meetings with clients to get a more realistic feeling of what it is like working in the industry."*

This finding is unique to the study, as the students primarily engaged in remote work with overseas-based companies. Notably, advocating for the integration of local projects into the curriculum can enhance students' connections to their community, support economic growth, and align educational efforts with the needs of the local job market.

5.3.2 Theme 2: Enhanced Project Screening

This theme underscores the importance of enhanced scrutiny and screening of employers' projects and their requirements, stemming from the challenges faced by some student groups in executing complex projects. The recommendation emerged as a response to the difficulties encountered by these groups, which hindered their ability to complete projects successfully. Respondents mentioned that the WIL coordinating team should "*Better assess the projects that employers presented and determine if it's workload is capable of being handled by students*" (Participant, P14).

This finding aligns with research by Ha (2022) and Jackson et al. (2016) highlighting the significant barrier posed by the identification of suitable projects by employers in the successful implementation of work-integrated learning. It is therefore necessary for instructors to work alongside employers in identifying and scoping projects for students to undertake. By improving the screening process for projects, educational institutions like the University of Guyana can ensure that students are matched with projects that align with their skill levels and capabilities, thereby enhancing the effectiveness and outcomes of WIL initiatives.

5.3.3 Theme 3: More Attractive Reward Systems

This theme highlights student recommendations for incentivization and remuneration for their work done with employers. The data indicates a strong preference among respondents for cash incentives or monetary rewards in addition to receiving a grade for the course. Students feel that financial compensation would not only acknowledge their efforts and contributions, but also provide additional motivation and reflect the value of their work in a real-world context. For instance, comments such the following suggested that WIL coordinating team should negotiate for better student rewards:

> "*Ensure a list of incentives are available to students before they negotiate with the clients. Some of us worked under the impression that we would gain nothing, but a grade from the course. Our client expressed that there were just talks of students undertaking their projects so clients would think that it will be done for free or as a trial for the students' course"* (Participant, P09).

This finding aligns with studies suggesting that some WIL opportunities support compensation measures (Pittenger, 2021). Additionally, Eaton (2018) argues that monetary payment is important, and Pittenger (2018) emphasizes that this compensation must be fair. Such incentives could enhance engagement, commitment, and the overall quality of their work-integrated learning experience.

5.3.4 Theme 4: Stricter Stipulations for Clients

This theme captures student recommendations regarding stricter stipulations for employers, focusing on two main aspects: adherence to a fixed set of project requirements and availability to provide feedback. Overall, it was found that students believe clearer expectations and consistent communication from clients are essential for successful project completion. Participant P16 recommended, "*Have stricter stipulations for client detailing what is allowed and what is not allowed. Some clients expand the project*." This finding aligns with research by Ha (2022) and Smith et al. (2006) who highlight the challenges posed by the commitment of host employers to WIL activities and their understanding of WIL processes. As such, to significantly improve the educational experience for students, the WIL coordinating team within the Computer Science Department at the University

should ensure that clients are fully engaged and understand their roles.

5.3.5 Theme 5: Technical Support

This theme captures ways in which students can be supported prior to the start of their WIL course. Some respondents suggested that more in depth exposure to online collaboration tools for project management, as well as source code development and management is needed, especially since their groups primarily worked in a remote setting. They claim that comprehensive experience with these tools would have been useful in bolstering their performance as a team in the course. For example, Participant P22 reported:

> *"I think the WIL approach can be improved tremendously if students are taught how to work in remote environments effectively. I believe more exposure to collaborative tools directly in prior courses, leading up to this one, would be beneficial overall. For example, tools like Trello for team and project management, more in depth usage of GitHub and Git for source code management, or code collaboration via extensions on editors like Atom and VS Code live share for the remote environment."*

The researchers acknowledge that using these tools can mimic real-world industry practices, thus better preparing students for their future careers. In addition, familiarity with online collaboration and code management tools can make students more attractive to potential employers and ease the transition from academic projects to professional environments. Interestingly, although the students had some prior exposure to these tools, the researchers found this experience to be insufficient. As such, applying these tools during their work-integrated learning (WIL) aimed to fill these gaps and enhance their skillsets. However, as a recommendation, the Computer Science department should provide earlier and more frequent exposure to these tools across multiple courses to build students' confidence and proficiency.

6. Conclusion

To conclude, the research examined how a work-integrated learning approach is perceived by students in a course at the University level. The study was guided by a conceptual model of a work-integrated learning approach to understand whether its techniques are introducing benefits or challenges to the delivery of the Applied Project course at the University of Guyana. The study's findings echo the benefits and challenges of WIL literature among the various stakeholder groups. From the students' perspective, the WIL approach is perceived to be generally helpful in enhancing confidence in working on real work projects, course participation and professional development along with gaining and validating work experience and employable skills.

However, there are challenges faced by students in the areas of project commitment by employers, project feedback from employers, volatile project scoping, group preparedness and dynamics and work-life balance and motivation. It is recommended that the approach be modified to include more local employers and local projects, enhance the screening of its projects, institute more attractive reward system for its students, institute stricter stipulations for client regarding communication with students and increase the technical support for the course.

6.1 Future Work

Given the focus of this study, it would be useful to carry out further investigation of the perspectives of instructors and employers that are also part of the work integrated learning approach. Such an investigation can yield data that can provide a better understanding of the challenges faced by instructors during the administration of the course. Further, it can highlight the issues that employers encounter in connecting, communicating, and working with students undertaking their projects.

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