Integrated work study program: Students' growth mindset and perception of change in work-related skills

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The purpose of this study is to evaluate students' perception of growth in the area of work-related skills through their participation in an integrated work study program (IWSP). In Singapore Institute of Technology (SIT), 368 students across a range of six programs took part in an IWSP lasting six to twelve months. Students reported self-perceived improvements after IWSP in their work-related skills, encompassed by six domains – learning & work integration; professionalism; communication; problem solving and decision-making; teamwork; and adaptability. Their mindset was additionally analyzed against ratings by their work supervisors to determine if having a fixed or growth mindset would have any implications on how their work-related skills were perceived. This paper thus investigates the impact of the IWSP on students' self-perceived growth in comparison to their work supervisors' perception of them, and whether mindset contributes to this.

Keywords: Work-based learning, work-integrated learning, growth mindset, work-based assessment, learning outcomes, graduate outcomes

INTRODUCTION

Work-based learning (WBL) is a feature that is integral to higher education programs around the world. In the context of Singapore Institute of Technology (SIT), a program called Integrated Work Study Program (IWSP) exists as a unique amalgamation between the concept of WBL as a vocational education model, and the more academically rigorous concept of work-integrated learning (WIL). IWSP is a distinctive feature of the university's degree programs as it is compulsory for all students and has its foundational roots in the participation of authentic work. Accordingly, this drives an emphasis of learning through practice in tandem with an integration of theory at the workplace.

In this paper, a review of the literature is first considered in order to provide context of WBL and WIL as approaches to raise students' acquisition of work-related skills for future employment outcomes. Collectively, the literature expounds definitive concepts and vast amounts of benefits as well as challenges when utilizing WBL and WIL at the higher education level. In addition, the emergence of mindset theory (Dweck, 2006) in the educational context is discussed, since it posits that mindsets have an effect on students' academic achievement and subsequent real-world outcomes. Lastly, students' development from the IWSP is presented, along with how mindset affected their IWSP outcomes.

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Work-Based Learning and Work-Integrated Learning

Since the 1980s, universities have engaged in WBL to match the significant growth in the need for a workforce with skills largely associated with higher education (Lester & Costley, 2010). WBL refers to learning through the gathering of work experience where the learner's role is implied to be more proactive. Dalrymple, Kemp, and Smith (2014) emphasize the importance of a so-called triadic approach – that no meaningful practical or theoretical knowledge is synthesized until a harmonization among the three parties (i.e., university, industry, and students) occurs. Although WBL includes apprenticeships and internships, there is still a distinction between merely garnering work experience compared to WIL, which focuses on integrating discipline-specific learning and skills with workplace practice and application (Smith, 2012). As an educational approach, WIL utilizes relevant work-based experiences to allow students to integrate theory with the meaningful practice of work as an intentional component of the curriculum. In particular, WIL draws upon a number of prominent learning theories and student-centered pedagogies such as experiential-based learning, immersive learning, and transformative learning (Mezirow, 1997).

Accordingly, this creates an opportunity for universities to design, refine, and teach curricula that is responsive to current and future needs of the industry. Further, universities are able to equip students with the knowledge and capability beyond mere acquisition of discipline knowledge and can actively engage students with industry and community partners to enhance work readiness (Smith, 2012). WIL has thus become a catch-all term that refers to curriculum strategies which allow students the chance to experience and apply disciplinary or generic skills in the real world of work (Smith, Ferns, Russell, & Cretchley, 2014). Despite the several iterations of WBL and WIL programs that exist around the world, they are all ultimately consistent in their goal of preparing students for the labor market through the development of transferable skills as well as discipline-specific skills that are in demand by the industry. It is therefore no surprise that in some disciplines, WIL-based experience is required for professional accreditation.

Research purports substantial positive effects in confidence, motivation, and initial job opportunities for students who engage with employers during their program of study when the curriculum is appropriately aligned with real-world needs. By utilizing the workplace as a learning resource, students are provided with the opportunity to develop work-related skills whilst remaining as engaged learners who can apply foundational and theoretical knowledge in an authentic environment. Importantly, the benefits of WIL extend beyond enabling authentic experiences for students to augment their graduate employability with work-related skills. Aside from host organizations being able to harness the disciplinary expertise that students possess, they also have the chance to shape curriculum towards relevant industry needs. Through this maintenance of networks with professional practitioners, higher education providers are in turn informed of ever-changing workplace practices and expected skills standards for new graduates (Jackson, 2013). In this manner, WIL acts as a key strategy for not only developing work-related employability skills in students, but also boosts their future employment rate whilst consistently enhancing the curriculum and learning outcomes of higher education (Rowe & Zegwaard, 2017).

Mindset

Aside from WBL and WIL experiences, the mindset theory has also been used to account for individual differences in student outcomes. Based on implicit theories of intelligence, the belief that human attributes are malleable and can be developed (incremental theories or growth mindset) contrasting to

believing that these attributes are invariant (entity theories or fixed mindset), is said to be what underpins an individual's self-regulation, resilience, and challenge-seeking tendencies (Dweck & Leggett, 1988; Dweck, 2006). More specifically, beliefs would manifest as differences in goal-setting tendencies, where those with a growth mindset will tend to set learning goals and strive for mastery as they believe intelligence can be improved and developed. On the other hand, those with a fixed mindset view intelligence as fixed and unchangeable, and thus focus on setting performance goals or avoid challenges in order to validate their ability (Dweck & Yeager, 2019).

In an academic context, this social-cognitive model of achievement motivation has manifested as policy changes encouraging the adoption of a growth mindset as an intervention to improve academic achievement (Rattan, Savani, Chugh, & Dweck, 2015), given that implicit theories of intelligence are related to achievement (Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013). Typically, having a growth mindset would predict an upward trajectory in grades that is absent for those with a fixed mindset (e.g., Aronson, Fried, & Good, 2002). It is further implied that the differences in performance between those with fixed or growth mindsets only appear when faced with challenging situations, rather than due to a difference in baseline abilities (Blackwell, Trzesniewski, & Dweck, 2007). Thus, mindset is of interest in the context of students' participation in the IWSP, since it is a challenging first exposure of authentic work experience for most of them.

CONTEXT OF THE RESEARCH

The Integrated Work Study Program (IWSP) is a new approach in the Singapore higher education pedagogical landscape. It is an enhancement to the traditional models of internship or industrial attachment. This is due to its longer duration of attachment, which allows for more authentic work experiences. Its main principle rests on the production of graduates who are effectively equipped with strong theoretical foundations whilst possessing a keen understanding of its real-world work applications as a result of the applied degree pathways and close nexus to the industry. The design of our university's applied learning framework lies in the over-arching allowance towards developing in-depth domain-specific skills and transferable skills, as well as the provision of industrial readiness in our students.

Hence, the goal of an IWSP is the assimilation of WBL and WIL between students, the industry and community, and the university, so that students are aided in their journey towards becoming established professionals with a mastery of deep specialist skills and employability skills. Students are thus able to gain a deeper understanding and appreciation for lifelong learning, whilst simultaneously harnessing their talents and passion for the benefit of the larger community. This builds upon the emerging trend of universities incorporating some form of WIL experience in their curriculum for students to acquire work-related skills appropriate for their discipline, in order to enhance graduate employability (Artess, Hooley, & Mellors-Boune, 2017).

Nevertheless, studies into the impact of work placements for graduate outcomes tends to be mixed. For example, when business students from 38 UK higher education institutions were tracked four years into their early careers, those who had completed a year of work placement during their studies did not consistently report more positive skills development or graduate employability outcomes (Wilton, 2012). Similarly, in Australia, having a paid work experience in their final year did not have a significant effect on the likelihood of students attaining a full-time job four to six months after graduation (Jackson, 2014). Yet, there are also studies that suggest that prior academic performance and WIL participation contributes positively towards career outcomes (e.g., Moores & Reddy, 2012),

which aligns with the underlying assumption that successful completion of the WIL experience is a proxy indicator for a certain level of competence. This suggests that the impact of work placements on graduate outcomes is likely dependent on the context or industry.

At the level of the individual, employability skills that have been deemed important by employers include teamwork, problem solving skills, and communication, amongst many others (Lowden, Hall, Elliot, & Lewin, 2011). Other attributes like adaptability, flexibility, and initiative have also been associated with graduate employability as indicators that drive the ability to cope with work challenges (Palmer, Young, & Campbell, 2018). As such, it is vital to consider the development of employability skills of each individual because WIL participation alone does not guarantee employment outcomes nor heightened work-readiness (Smith, Ferns, & Russell, 2019). Furthermore, since enhanced employability and work-related skills cannot be assumed simply by including WIL experiences, there is a need to evaluate students' progress from the perspective of a student, staff, and industrial institution (Smith et al., 2014).

In the Singapore Institute of Technology (SIT), a substantive curriculum component is devoted to integrated work-study, as the university strives for IWSP to meet high standards of academic rigor to fulfil professional accreditation requirements (Ng, Yeo, & Foo, 2020). This involves close collaborations with relevant industry partners who provide real work experience for students in their respective fields of specialization. IWSP is mandatory for all students in SIT and typically begins towards the end of their penultimate year of studies. Instead of placing students in the workplace, students have to apply and undergo interviews for positions offered by companies in their relevant industries. Industry partners would then, in collaboration with SIT faculty, train students in performing work similar to equivalently qualified employees for a span of six to twelve months. This allows students to integrate classroom learning with the real world, and vice versa. In addition to a work supervisor at the company, each student is assigned an IWSP university supervisor who can either be a faculty member with industry experience or a professional officer who is typically a mid-career professional. The role of the IWSP university supervisor is to mentor and coach the students during their IWSP, as well as to help students draw links between workplace problems and what is taught in the university. Concurrently, the IWSP university supervisors facilitate the immersion of academic learning through students' submissions of reflection reports or innovation reports. This ensures academic vigor is coupled with an authentic industry experience.

STUDY OBJECTIVE

The aim of the study was to ascertain how useful the IWSP was for students to acquire work-related skills appropriate for their discipline, with the hope that this will in turn increase their future graduate employability outcomes. These skills reflect the university's applied learning framework in facilitating the development of in-depth domain-specific skills, industry readiness, and transferable skills in IWSP students. Specifically, the skills of particular interest are learning and work integration, professionalism, communication, problem solving & decision-making, teamwork, and adaptability.

Formally, students were assessed by their work supervisors at the end of their IWSP on these six domains. With the intention of holistically assessing learning outcomes and acquisition of work-related skills, students also reported their self-perceived skill levels before and after the IWSP. In addition, students completed a mindset questionnaire prior to the IWSP to give an indication of their mindset, as this was considered an element that could influence their IWSP performance.

The research three questions were:

1. Do students perceive significant changes in their work-related skills after their IWSP?
2. How different are the ratings by work supervisors compared to students' self-perceived ratings of their work-related skills?
3. Does having a fixed or growth mindset accrue any implications in terms of how work supervisors rate students on their work-related skills?

METHODS

Participants

A total of 368 students from six undergraduate programs at Singapore Institute of Technology (SIT) were included in this study. Namely, the programs were Accountancy, Food Technology, Pharmaceutical Engineering, Systems Engineering (ElectroMechanical Systems), Sustainable Infrastructure Engineering (Building Services), and Sustainable Infrastructure Engineering (Land). Ethical clearance for this research was granted by SIT's Institutional Review Board (#20170053).

After removing incomplete responses, there were 258 cases where students who completed the pre-IWSP survey also received work supervisor assessment ratings after the IWSP (see Table 1 for distributions). However, as a subset of students did not complete the post-IWSP survey, the analysis of ratings between pre- and post-IWSP were reduced to a sample size of 240. Quantitative data analysis was conducted using SPSS version 25 (IBM Corp, 2017).

TABLE 1: Distribution of students per program (n = 258)

Program	Sex		Respondents	
	Male	*Female*	*n*	*%*
Accountancy	26	34	60	23.3
Food Technology	4	44	48	18.6
Pharmaceutical Engineering	6	54	60	23.3
Systems Engineering (ElectroMechanical Systems)	15	6	21	8.1
Sustainable Infrastructure Engineering (Building Services)	17	32	49	19.0
Sustainable Infrastructure Engineering (Land)	16	4	20	7.8

Measures

Work-related skills

A questionnaire consisting of 19 questions was developed for the purpose of evaluating students' work-related skills. The work-related skills that were considered essential for later success was based on the work by Smith and others (Smith et al., 2014), with some changes to the naming of the constructs to match terms that employers and students in Singapore are more familiar with. This was encompassed by six domains that are considered vital for graduates' future success in the 21st Century – namely, learning & work integration, professionalism, communication, problem solving & decision-making, teamwork, and adaptability (Table 2).

Both before and after the Integrated Work Study Program (IWSP), students were given up to two weeks to complete the self-assessment survey via an in-house developed online portal. Respectively, the survey opened one month before their IWSP commenced, and on the last day of their IWSP. Students

rated their work-related skills on a 10-point scale which ranged from unsatisfactory (1) to excellent (10). Calculating Cronbach's alpha to evaluate internal reliability, the coefficient was above 0.9 for each of the six work-related skill domains, indicating good internal consistency. An open-ended question was also included in the survey to capture any comments students might have on what they found particularly useful, or how their IWSP experience could have been improved.

TABLE 2: List of items constitutive of each work-related skill domain

Domain	Work-Related Skill
Learning & Work Integration	1. Learns new materials quickly
	2. Apply learning from university to real world
	3. Has in-depth knowledge of field of study
Professionalism	4. Is proactive and motivated
	5. Takes ownership of work and learning
	6. Produces quality work
Communication	7. Speaks clearly and effectively
	8. Writes clearly and effectively
	9. Listens to differing views
	10. Puts across opinions respectfully
Problem Solving & Decision-Making	11. Evaluates situations and data
	12. Suggests options to resolve issues
	13. Demonstrates sound judgement and takes ownership of decisions made
Teamwork	14. Works effectively in teams
	15. Contributes positively to achieve common goals
	16. Build relationships with team members
Adaptability	17. Adapts to new culture and environment
	18. Remains effective through change and ambiguity
	19. Works effectively with people from diverse backgrounds

Similarly, students' work supervisors completed a shortened version of the questionnaire through the online portal once IWSP was over. These work supervisor assessments involved work supervisors rating the student on each of the six domains, ranging from unsatisfactory (1) to excellent (5). In order to make the comparison out of 10 for each domain of work-related skills when comparing ratings between students and work supervisors, the average of each domain rated by students was contrasted with ratings by work supervisors after multiplying the work supervisor's rating by two. Respective program directors and the university's Centre for Career Readiness also maintained close communication with the work organization to ensure that supervisors had clear expectations towards IWSP and its assessments.

Mindset

Before the start of IWSP, the Mindset Assessment Profile tool (Mindset Works, 2012) was also administered to students as part of the pre-IWSP survey. Based on a six-point scale, students indicated their level of agreement from strongly disagree (1) to strongly agree (6) on eight statements, with four of these items reverse-scored. The statements reflected their mindset and beliefs towards the ability to grow and improve one's intelligence as well as their perspective on working hard and making mistakes.

Students were then classified into fixed or growth mindset groups based on their total mindset scores, with higher scores corresponding with more growth mindset. Mindset profiles ranged 10 levels as a continuum, from a strong fixed mindset (F5), to weak/unsure fixed mindset (F1), weak/unsure growth mindset (G1), and strong growth mindset (G5). Most students clustered around the unsure categories (F1 and G1 respectively; see Table 3).

TABLE 3: Breakdown of students' ($n = 258$) mindset groups according to the Mindset Assessment Profile tool by Mindset Works (2012).

Mindset Group (Score range)	Description	Respondents	
		n	%
F5 (8-12)	You strongly believe that your intelligence is fixed – It doesn't	0	0
F4 (13-16)	change much. If you can't perform perfectly you would rather not do something. You think smart kids don't have to work hard.	0	0
F3 (17-20)	You lean towards thinking that your intelligence doesn't	1	0.4
F2 (21-24)	change much. You prefer not to make mistakes if you can help it and you also don't really like to put in a lot of work. You may think that learning should be easy.	8	3.1
F1 (25-28)	You are unsure about whether you can change your	105	40.7
G1 (29-32)	intelligence. You care about your performance and you also want to learn, but you don't really want to have to work too hard for it.	97	37.6
G2 (33-36)	You believe that your intelligence is something that you can	37	14.3
G3 (37-40)	increase. You care about learning and you're willing to work hard. You do want to do well, but you think it's more important to learn than to always perform well.	8	3.1
G4 (41-44)	You really feel sure that you can increase your intelligence by	1	0.4
G5 (45-48)	learning and you like a challenge. You believe that the best way to learn is to work hard, and you don't mind making mistakes while you do it.	1	0.4

RESULTS

Comparing students' pre- versus post-IWSP ratings, students reported a self-perceived change on all six domains of work-related skills after IWSP, with higher self-ratings at post-IWSP on average ($p < 0.001$; Table 4). The most improved work-related skills were related to learning & work integration, followed by adaptability.

Further, when comparing work supervisor assessment ratings with how students rated themselves at post-IWSP, work supervisors rated students higher on average across all domains, except for problem solving & decision-making ($p < 0.05$; Table 5).

TABLE 4: Paired samples t-test of pre- and post-IWSP ratings by students (n = 240) on the six domains of work-related skills.

Work-related Skill	Pre-IWSP Mean (SD)	Post-IWSP Mean (SD)	Paired samples t-test			
			t	df	p	d
Learning & Work Integration	6.67 (1.31)	8.17 (1.34)	14.99	239	.00	.97
Professionalism	7.38 (1.36)	8.53 (1.20)	12.68	239	.00	.82
Communication	7.33 (1.28)	8.35 (1.25)	11.24	239	.00	.73
Problem Solving & Decision-Making	6.92 (1.30)	8.25 (1.29)	13.75	239	.00	.89
Teamwork	7.40 (1.28)	8.64 (1.17)	14.12	239	.00	.91
Adaptability	7.26 (1.32)	8.67 (1.19)	15.25	239	.00	.98

TABLE 5: Independent samples t-test of students' post-IWSP self-ratings versus work supervisor assessment ratings across the six domains of work-related skills (n = 240).

Work-related Skill	Post-IWSP Mean (SD)	Supervisor Mean (SD)	Independent samples t-test		
			t	df	p
Learning & Work Integration	8.17 (1.34)	9.08 (1.21)	7.75	478	.00
Professionalism	8.53 (1.20)	8.82 (1.32)	2.50	473.59	.01
Communication	8.35 (1.25)	8.64 (1.30)	2.50	477.48	.01
Problem Solving & Decision-Making	8.25 (1.29)	8.37 (1.34)	1.00	478	.32
Teamwork	8.64 (1.17)	9.22 (1.17)	5.45	478	.00
Adaptability	8.67 (1.19)	8.99 (1.27)	2.89	476.22	.00

In sum, students' self-ratings at post-IWSP was significantly higher than their self-rating at pre-IWSP for all work-related skills, and work supervisors rated students higher than how students rated themselves after IWSP on all work-related skills with an exception of similar ratings for problem solving & decision-making (Figure 1.).
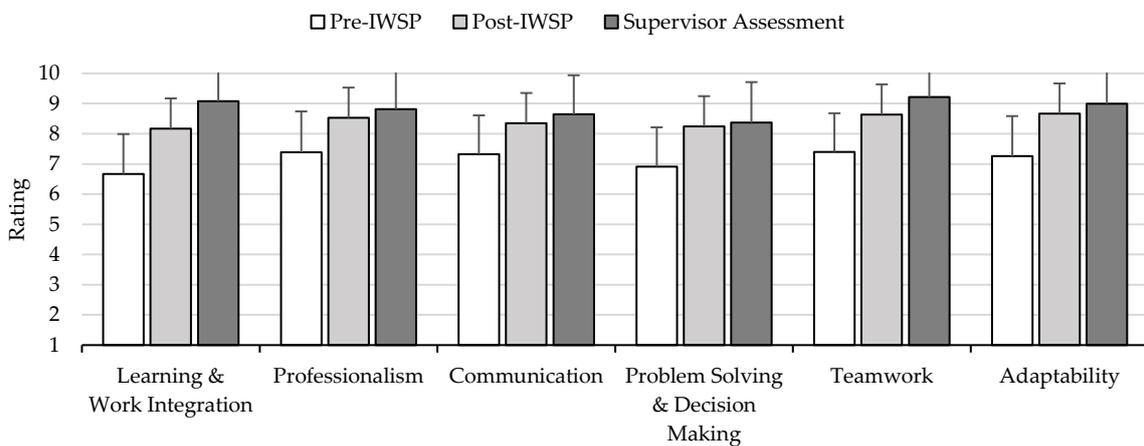
FIGURE 1: Comparison of means of students' self-ratings at pre-IWSP and post-IWSP against ratings by their work supervisor, across the six work-related skill domains (n = 240). Error bars indicate standard deviation.

For the purpose of analyzing the effect of mindset, we contrasted students who had a fixed or unsure mindset (F5 to G1; $n = 211$) against those with a growth mindset (G2 to G5; $n = 47$). When testing if ratings by work supervisors were different between the two mindset groups, students with a growth mindset were rated significantly higher than those with a fixed or unsure mindset on average for problem solving & decision-making, $U = 4078.0$, $p = 0.033$, $r = 0.133$. There was no statistical difference in ratings between the two mindset groups for any of the other five work-related skills ($p > 0.05$).

DISCUSSION

As methodologies that were used to measure student learning each had their own limitations and biases, the best practice in educational research dictates triangulating data from different sources to limit errors (Breslow, 2007). The reliance on both direct and indirect measures then strengthens the validity of the assessment. To understand students' learning in this study, the direct measure of ratings of students' performance by their work supervisors was paired with the indirect measure of students' self-perceived change in their work-related skills.

The study sought to investigate whether students would perceive any change in their work-related skills after they completed their Integrated Work Study Program (IWSP). This represented the main indicator of whether IWSP benefitted students in acquiring work-related skills, in with the expectation that developing these skills would enhance their future employability outcomes. Specifically, the skills targeted consisted of learning & work integration, professionalism, communication, problem solving & decision-making, teamwork, and adaptability. This was achieved by comparing their self-assessed ratings at pre- and post-IWSP, which revealed encouraging results that students perceived a significant improvement in all six domains of work-related skills. Further, in order to holistically assess the learning outcomes of the IWSP, students' ratings were compared to how their work supervisors rated them after the IWSP. In comparison to students' Post-IWSP self-assessed ratings, work supervisors rated students even more positively on all work-related skill domains, with an exception for ratings in problem solving & decision-making being similar to how students rated themselves after the Integrated Work Study Program (IWSP).

An additional aim of the study was to determine if students' mindset before their IWSP commenced would influence how work supervisors rated them. It was observed that students with a growth mindset received better ratings by their work supervisors in problem solving & decision-making. This coincides with the definition of having a growth mindset, such that these individuals are more open to challenges and experimentation in their pursuit of mastery goals. However, mindset did not have any effect on supervisors' ratings for any other work-related skill. The inconsistency of whether mindset influences objective academic outcomes is reiterated in the literature. For example, having a growth mindset could have no effect at all (e.g., Bahník & Vranka, 2017; Kaijanaho & Tirronen, 2018), or may only be relevant in improving academic achievement for high-risk students (Paunesku, Walton, Romero, Smith, Yeager, & Dweck, 2015). It is thus imperative to note that a recent meta-analysis has suggested that although mindset is indeed related to academic achievement, this effect tends to be weak and should be interpreted with caution (Sisk, Burgoyne, Sun, Butler, & Macnamara, 2018). Ultimately, this would suggest that although having a growth mindset could be beneficial for students' employability outcomes, there are other potential mediators and moderators to consider.

To make WIL placements effective, it is crucial to incorporate authenticity, appropriate preparations and debrief, supervision, and the integration of theory and practice via assessments and practical application (Smith et al., 2019). Smith and colleagues also note that more so than the duration or type

of placement (i.e., full- versus part-time work), what is vital is the quality and authenticity of the WIL placement. Qualitative feedback from our students in the questionnaire suggest that these themes were met, in particular for authentic work ("the IWSP duration put myself in a greater advantage as I was tasked with projects like a full-time employee"), value beyond the classroom ("a fruitful experience as I managed to learn a lot of technical hand-on knowledge which are not taught in class"), and gaining clarity towards future goals ("IWSP is effective in allowing students to experience how it is like working in the industry. It also gives us the opportunity to find out about the different areas in the company so that we can path our career choice").

Of note is the fact that students reported highest self-perceived improvements in their learning and work integration skills. This was also the second highest skill that work supervisors rated students on at the end of the IWSP. As mentioned earlier, mere WIL participation does not guarantee employment outcomes nor heightened work-readiness (Smith et al., 2019). Instead, Singapore Institute of Technology (SIT) makes substantial efforts in the curriculum to integrate work and study during the IWSP. Beyond learning at the workplace, students are assessed on academic work which includes reflective reports and innovation projects where theories and techniques must be applied to solve a problem that was identified at the workplace. Having both a work supervisor and an IWSP university supervisor working together to support the students' learning, in addition to assessments of work performance and academic work, may have contributed to students' learning & work integration skills being rated so highly.

Beyond the effort towards integrating work and study, there were three distinct features of the IWSP that could have promoted positive learning experiences for students. First, students were not placed into their jobs. Rather, each student applied for a position and was interviewed and selected by the work organization. This helped to increase job fit and a sense of autonomy for both students and supervisors. According to self-determination theory, autonomy is one of the key elements that contributes to motivation (Deci & Ryan, 2000). This potentially enhances the learning experience as students are less likely to view the IWSP as simply another module that fulfils university credits. Second, the duration of the IWSP should be highlighted. With the exception of one program having an IWSP of six months, all remaining programs had an IWSP lasting between eight to twelve months. For authentic assessment to take place, it should involve connecting and applying different perspectives, an allowance for competing solutions, and provision of opportunities to collaborate and reflect (Lim, Foo, Loh & Deng, 2020; Mueller, 2018). In line with this, the extended duration of the IWSP provided ample opportunities for authentic work to be given and assessed, such that with the involvement of university supervisors, companies were able to train students in performing work similar to other equivalently qualified employees (Ng et al., 2020).

Third, there was an emphasis that university supervisors supported work supervisors by coaching and mentoring the students when they struggle, instead of providing direct solutions. As a consequence, learners could discover their own capabilities and judge their own ability to engage in the task at hand (Law, 2013), thus improving their self-efficacy or belief in their own capacity to achieve a given goal (Bandura, 1977). This method of supervision could have contributed to students' perception of improvement across the six work-related skill domains over time. Given that students have learnt foundational knowledge before starting their IWSP, the role of the university supervisor was not to teach direct knowledge, but rather to coach students in applying what they had learnt to the workplace. Although coaching and mentoring may take longer than direct provision of solutions, it can reap more benefits for learners in the long run. In summary, the salient features worth highlighting for practitioners in WIL include incorporating an interview process instead of relying solely on student

placements, having an extended duration to allow for authentic work and assessment to occur, and facilitating application of what is learnt in university at the workplace through coaching and mentoring students.

Although this study contributes to the literature on the value of WIL, there are several limitations. As with any self-assessment survey, social desirability and self-presentation could have motivated a skew in students' responses, even if self-assessment is a crucial tool to enhance students' awareness of their performance (Lew, Alwis, & Schmidt, 2010). This skew is potentially mitigated by the comparison of students' Post-IWSP self-ratings against their work supervisors' ratings, as well as ensuring that students did not get to see how they initially responded in the Pre-IWSP questionnaire. To encourage honest reflection, students were also made aware that their self-ratings were not visible to their supervisors. However, so as to not overburden the work supervisors, they completed a shortened version of the questionnaire when rating students' skills.

Consistent with trends in the literature, work supervisors generally rated students highly on all skills (e.g., Milne & Caldicott, 2016). Arguably, high ratings by supervisors could reflect a leniency bias, where students were rated more favorably than is warranted by their performance because of low or unclear expectations (Vinton & Wilke, 2011). Another explanation for inflated ratings is the halo bias, where supervisors rate students based on their potential and enthusiasm rather than actual performance (Wolf, 2015; Jackson, 2018). Nevertheless, the fact that ratings by supervisors and students were similar for problem solving & decision-making after the IWSP could suggest that the influence of these biases in supervisor ratings was minimal. If the difference in ratings by students and their work supervisors are taken at face-value, it could be suggested that SIT students are modest and have a careful view of their skills.

The IWSP is nevertheless a unique WIL platform since it is mandatory. This isolates the impact of the placement by decreasing the likelihood that its value is confounded by the prior motivations of students. For example, in other universities where students are selected for work placements based on certain criterion, personality or attitude factors that predisposed them to undertake a placement in the first place could account for subsequent differences in academic achievement between those who went on work placements versus those who did not (Palmer et al., 2018). Accordingly, future work will continue to build upon this by investigating whether work supervisor ratings from the IWSP would translate to differences in concrete graduate employment outcomes, as one should not simply assume that employment outcomes will be enhanced simply by including WIL experiences for students (Rowe & Zegwaard, 2017). Future studies could also investigate potential mediators and moderators of growth mindset in relation to the outcomes of WIL, as students with a growth mindset were rated more positively in problem solving & decision-making by their work supervisors. One potential implication could thus be for supervisors to consider emphasizing some principles of having a growth mindset when training students in problem solving. This could include praising effort and processes especially when things are difficult, or mentoring students towards appreciating constructive feedback and learning from mistakes.

CONCLUSION

To facilitate the acquisition of work-related skills in graduates and improve their graduate employability, universities are increasingly embedding work-based and work-integrated learning in their curriculum. Another emerging trend in education is the use of growth mindset interventions to further improve academic achievement of students, which operates under the assumption that those

with a growth mindset will accrue better performance. In the current sample, this was demonstrated when work supervisors rated problem solving & decision-making skills of students, such that students with a growth mindset prior to starting their IWSP tended to be rated more positively. However, although mindset might contribute to performance, it is certainly not the sole contributor since there was no difference in supervisor ratings between those with and without a growth mindset for other work-related skills.

In conclusion, the results indicate that across all six degree programs in the present study, the IWSP is a successful applied learning opportunity for students to develop and hone their work-related skills. The IWSP enabled more authentic work experiences due to its longer duration and efforts to integrate between academic study and work in the industry, such that students were given ample opportunities to develop in-depth domain-specific skills as well as transferable skills. Indeed, it appears that the assimilation of WIL between students, the industry, and the university, is imperative to augment the development of work-related skills in students. This further adds to the view advocating how valuable WIL is towards enhancing students' confidence in their abilities and performance at the workplace.

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