The nature of students' learning outcomes during and following participation in a simulation remediation program

NICOLE NG[1]
The University of Sydney, Sydney, Australia
BELINDA KENNY
Western Sydney University, Sydney, Australia
MERROLEE PENMAN
Curtain University, Perth, Australia
JACKY PEILE
Early Links OT, Sydney, Australia
DOMINIQUE SCHOLL
JENNIE BRENTNALL
The University of Sydney, Sydney, Australia

Simulation for success (SIM-S) was designed by work-integrated learning (WIL) academics and external clinical educators as an interprofessional, intensive remediation program for underperforming allied health students. Students engaged in authentic work-focused experiences in preparation for future clinical placements. A design-based research approach with mixed-methods was adopted to explore learning outcomes from perspectives of simulation facilitators and students. Learning outcomes were measured through descriptive analysis of students' goal attainment scaling, readiness for placement evaluation, and standardized national clinical assessment tools for subsequent placements. Framework Analysis was used to deductively code student learning goals. Students (n=23) built on their learner behavior, communication skills and information gathering skills. After participating in the SIM-S program, 19 students achieved a satisfactory outcome in their subsequent placement. Findings from this study may inform the design of future remediation programs that engage students in translating theory to practice, developing complex skills, and achieving professional competence.

Keywords: Simulation training, clinical remediation, allied health students, clinical readiness, design-based research

Clinical placements in work-integrated learning (WIL) are purposeful work-focused experiences integrated into allied health students' professional preparation programs (L. McAllister & Nagarajan, 2015). These placements facilitate students to apply theoretical knowledge during authentic, and relevant work tasks within their health discipline in clinical settings, hospitals, homes, and the community (Zegwaard et al., 2023). Development of clinical competence through placements is an essential component of students' readiness to practice, involving students, their educational institutions, and external stakeholders.

The transition from academia to placements is a significant, exciting, and often stressful experience for students, as they move beyond their familiar university environment (Alzayyat & Al-Gamal, 2014; Gribble et al., 2019). During placements, students are required to adapt to new work interactions, apply theoretical knowledge to practical situations and navigate nuanced assessment criteria in a complex professional context (Twomey & Pretti, 2023). Most students develop effective practice skills with support from workplace educators. However, some students experience learning challenges and are perceived as underperforming in workplace settings.

'Underperforming' students are students identified as struggling to acquire necessary skills or failing

[1] Corresponding author: Nicole Ng, ning3327@uni.sydney.edu.au

to meet clinical competency (Bearman et al., 2013; Cleland et al., 2008). The identification of underperforming students has been associated with negative impacts on clinicians' stress levels, as they must manage the student's learning with their professional roles and responsibilities (Bearman et al., 2013; Bourne et al., 2020). The implications of underperforming in placements are significant, leading to negative emotional, financial, and social impacts on the student, educational institution, and clinical educator (Bearman et al., 2013; Davenport et al., 2018; Evans & Harder, 2013; Gribble et al., 2019). Students may begin to question their career goals. However, with effective support, including remediation, these students may succeed in future placements and progress to become competent allied health professionals.

Remediation in an educational context includes diverse approaches to support students to achieve expected competencies (Culleiton, 2009). Typical placement remediation processes include establishing a learning contract with specific learning goals, additional assignments, one-on-one student and clinical educator remediation, discipline-specific remediation by university academics, or tutoring (Davenport et al., 2018). Though remediation has benefits, this process may increase students' stress (Haskvitz & Koop, 2004) and place strain on clinical educators (Davenport et al., 2018). Clearly, it is important for remediation programs to provide learning outcomes that facilitate students' capacity for placement competency. Yet, there are limited investigations into underperforming students' learning in allied health clinical contexts (Al-Sheikhly et al., 2020; Camp & Legge, 2018; Davenport et al., 2018; Makhani et al., 2012). Hence, existing remediation procedures are typically not well defined, and protocols vary according to discipline and university course (Camp & Legge, 2018; Davenport et al., 2018; Evans & Harder, 2013; Makhani et al., 2012; Park et al., 2022; Vacha-Haase et al., 2019). Further research is needed to investigate effective and efficient approaches to providing support, opportunities for active student engagement in purposeful work tasks, and the outcomes of remediation programs (Davenport et al., 2018; Harmon et al., 2021; Immonen et al., 2023). Simulation is proposed as an effective remediation approach for students identified as underperforming in placements.

Simulation and Remediation

Simulation as a mechanism for WIL involves creating a situation that replicates real-world placement experiences (O'Connor, 2014). Simulation is widely used as a teaching and learning strategy for improving clinical competency and has a sound research evidence base (Camp & Legge, 2018). It provides a safe environment for students to practice professional skills (Haskvitz & Koop, 2004) while ensuring patient safety (Berragan, 2011). Moreover, simulation provides a clinical framework for learning where the students are actively engaged in planning their learning, reflecting, and evaluating their learning outcomes (Chernikova et al., 2020). There is emerging research showing simulation may facilitate students' transition from academic to placement learning. A survey of occupational therapy students indicated that simulated learning significantly enhances self-perceived confidence and most fundamental skills across WIL-related areas (Richmond et al., 2015). Randomized control trials in occupational therapy, physiotherapy and speech pathology provided evidence for simulation as an alternative and supportive placement model (Hill et al., 2021; Imms et al., 2018; Watson et al., 2012). In keeping with these findings, a scoping review by Squires et al., (2022) noted increasing focus on simulation in allied health programs, either within or just before professional practice placements.

However, while evidence suggests promising short term learning outcomes from simulation experiences, long-term sustainability of skill enhancement remains uncertain (Heuer et al., 2022). Despite a robust theoretical foundation for simulation as an effective teaching and learning approach in allied health, research on simulation for remediation purposes mainly exists in nursing and medical

disciplines (Camp & Legge, 2018). Camp and Legge's (2018) integrative review revealed a need for more focus on simulation remediation in allied health disciplines to address evidence-based approaches that best support underperforming students. Concerningly, there is limited outcome data to show how students' acquisition of knowledge and skills during remediation transfers to real-life application in placements (Squires et al., 2022). In response, a simulation remediation program was developed and evaluated to specifically meet the needs of allied health students identified as underperforming on clinical placements. The program was developed for a specific health sciences context. However, learning approaches and outcome measures utilized in this program may have broader application in simulation remediation programs.

An Innovative Simulation Remediation Program

Simulation for Success (SIM-S) was iteratively developed and implemented by WIL academics and external simulation facilitators as a one-week (five-day) intensive program at an Australian university. In this study, there were 24 places available for allied health students identified as underperforming during previous placement experiences in occupational therapy, physiotherapy, and speech pathology degrees. Access to program places was prioritized according to the immediacy of placement needs and the WIL academic's evaluation of prospective students' readiness to benefit from an intensive, interactive, and interprofessional program. Students who accepted the invitation attended the SIM-S program as part of educational remedial intervention. It was offered at no charge during an inter-semester break.

SIM-S was specifically designed to support underperforming students in developing clinical skills required for achieving placement readiness and clinical competency. Before the program, students actively shaped their learning goals with help from WIL academics, considering prior experience, clinical assessment outcome and clinical educator feedback. Based on their learning needs, students were then assigned to one of four groups. The program was delivered in a purpose-built simulation center with a mock hospital ward and rehabilitation gym.

Each day, students attended from 8:30 am to 4:30 pm to reflect clinical working hours. The week started with orientation and discussion of students' learning goals with their simulation facilitators. From day one to five, students engaged in diverse learning experiences with opportunities to manage two patients per day and four different patients across the week in interprofessional groups of five to eight students. Patients (trained medical actors) were managed from assessment through treatment as a sequential roleplay. For students to demonstrate knowledge dynamically, they had time dedicated to case preparation, attending to patients, documentation, peer and interprofessional observation, debriefing for each patient session, and an interprofessional case conference. Learning experiences gradually increased in complexity as the week progressed and students were given time to reflect on goals and learning outcomes, with additional practice time provided each day. The five-day week concluded with individual student feedback from simulation facilitators, facilitator-evaluation and self-evaluation of learning outcomes, and students' written reflections on their learning experience.

The program was designed to provide opportunities for peer learning (Topping, 2005), interprofessional learning (Parsell, 1998), and support a process of cultural and psychological adjustment to the expectations of clinical placements (Attrill et al., 2016). The use of problem-centered tasks enabled students to immediately apply their learning (Knowles, 1973) while simulation facilitators shaped goal-focused practice opportunities. Cognitive load was set to an achievable level of challenge to foster interest and to provide practice toward mastery (Sweller, 1988).

Since there are gaps in empirical evidence for simulation as a remediation strategy, investigating the learning needs of underperforming students and the efficacy of such programs may enhance clinical remediation processes. Hence, this study investigated the research question, what was the nature of students' learning outcomes on completion of and following participation in a simulation remediation program?

METHODS

The study employed a convergent parallel mixed-methods approach (Creswell & Plano Clark, 2017) with qualitative and quantitative data. The iterative cycle of Design-Based Research (Barab & Squire, 2004) triangulated the SIM-S participants' learning goals, SIM-S outcome, and subsequent placement outcomes to evaluate and facilitate future re-design of the program. Ethical approval was granted by the host university's Human Research Ethics Committee (Ref: 2018/135).

Participant Recruitment

Participants were recruited from the SIM-S program cohort, which comprised 24 students from entry-level (undergraduate or masters) occupational therapy, physiotherapy, and speech pathology degrees. Students were from novice to advanced stages of professional preparation with a pre-requisite of underperformance in a previous placement experience.

Recruitment commenced one week after students' SIM-S completion, with an administrator, uninvolved in delivering SIM-S, inviting students who attended a minimum of four days of the program. Students were informed their decision did not affect future clinical placement allocation or assessment. Consent allowed the use of deidentified program and post-program data to examine their learning outcomes. All students who met attendance requirements and provided consent were eligible to participate in this study even if the artefacts of their involvement in SIM-S (program or post-program data) were incomplete.

Data Collection

For student participants, artefacts and outcomes from the SIM-S program were collated for those students who consented to participate in the study. Data included students' learning goals, Goal Attainment Scaling (GAS) ratings (Kiresuk & Sherman, 1968), Readiness for Placement Evaluation (RPE) ratings (Judd et al., 2023), and subsequent placement outcomes.

Allied health students in clinical education routinely form learning plans to identify individual placement goals. SIM-S students initially formed their learning goals in consultation with WIL academics to address specific learning needs based upon areas of concern identified from their previous placement. The simulation facilitators then reviewed individual student's goals and used them to support students' development through the program activities. The content of these learning goals summarized the priority remedial needs of each student.

At the end of the program, students reflected on and rated their perceived progress towards achievement of their goals. Likewise, simulation facilitators rated their observations of students' progress. These ratings formed a GAS based on the process developed by Kiresuk and Sherman (1968). GAS can provide a reliable and sensitive tool for documenting changes in student performance (Koski & Richards, 2015).

The 5-point Likert scale (-2 to +2) that described different levels of outcomes for proposed goals (Chapleau & Harrison, 2015) was adapted for the SIM-S context:

- -2 = performance decreased or lapsed
- -1 = performance remained unchanged
- 0 = achieved expected level
- +1 = achieved somewhat better than expected level
- +2 = achieved far above expected level.

For this study, GAS provided a standardized post-SIM-S measure of individual goal attainment of whether students' remedial needs had been met, as well as comparison between students' and facilitators' perspectives. GAS ratings enabled analysis of the nature of individual remediation goals achieved and not achieved to evaluate the SIM-S program.

The RPE was completed at the end of the program to determine whether students demonstrated a skill set consistent with placement preparation (Judd et al., 2023). The RPE was designed as a standardized measure to evaluate clinical skills and readiness for future clinical placements for students during simulation programs. For SIM-S, facilitators used the RPE to evaluate students' overall skills-based outcomes in four domains (each with five subskills):

1. Professional behavior
2. Learner behavior
3. Communication
4. Information gathering.

Facilitators also gave each student an overall rating of 'is not ready for clinical placement' 'requires remediation prior to clinical placement,' 'is ready for clinical placement,' or 'is ready for clinical placement and exceeds expectation' (Judd et al., 2023).

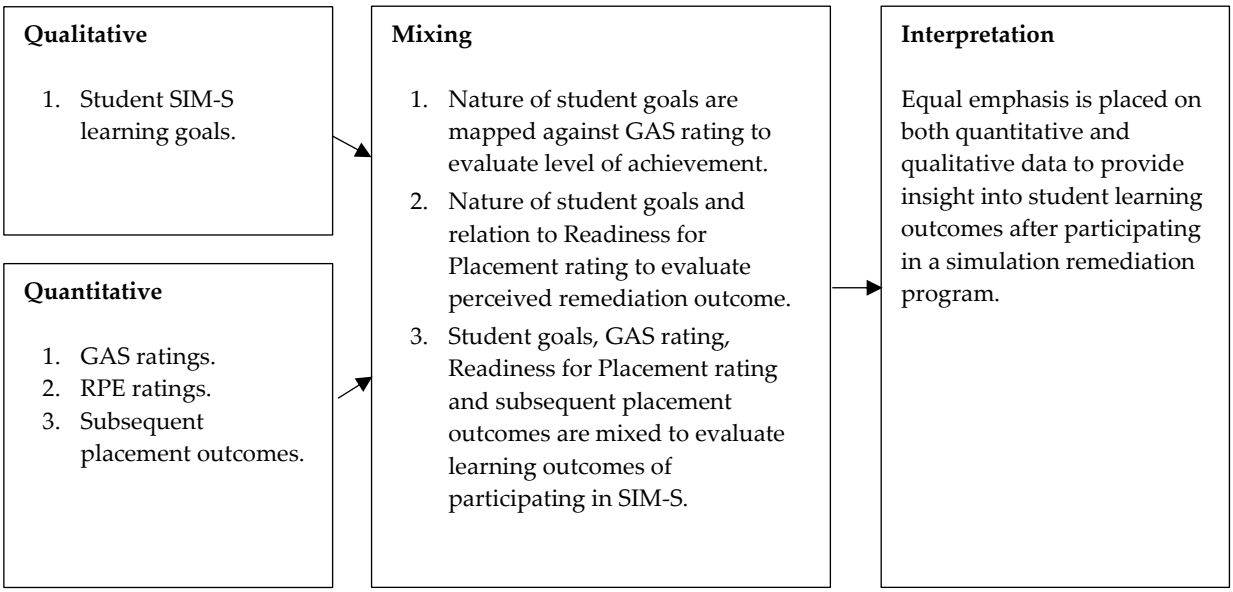
Students' subsequent placement outcomes were tracked to determine whether they met expected competency requirements. The students were assessed using discipline-specific standardized national clinical assessment tools. Quantitative ratings were required, and qualitative comments were encouraged. Subsequent placement clinical educators were not informed of students' participation in the SIM-S remediation program and students were evaluated as per usual practice.

Occupational therapy students were generally assessed using the Student Practice Evaluation Form-Revised (SPEF-R) (Division of Occupational Therapy, 2008). For one novice occupational therapy student, their next placement was assessed using the unpublished university-based assessment typical for that placement. Physiotherapy students were assessed using the Assessment of Physiotherapy Practice (APP) (Dalton et al., 2009). Speech pathology students were assessed using Competency Assessment in Speech Pathology (COMPASS®) (S. McAllister et al., 2013). For this study, clinical educators' ratings on these assessments were analyzed to explore a relationship between skills developed in SIM-S and students' achievement in their subsequent placement. This included their overall assessment outcome (i.e., 'satisfied requirements' or 'failed requirements'), and component clinical skills. The component clinical skills assessed within each discipline were categorized into the four RPE domains to enable comparison across disciplines and against SIM-S outcomes.

Data Analysis

In keeping with the convergent parallel study design, the qualitative and quantitative data were analyzed independently and sequentially (Creswell & Plano Clark, 2017). Figure 1 presents the process for data comparison, integration, and interpretation. By interrelating students' goal content, GAS ratings, RPE ratings, and subsequent placement outcomes, this analysis provided an enriched understanding of how the program supported students' remediation and subsequent placement success (Wisdom & Creswell, 2013).

FIGURE 1: SIM-S data analysis process.



Qualitative data from students' goals underwent framework analysis (Gale et al., 2013), employing a systematic deductive approach to map goals to assessment outcomes (Gale et al., 2013; Linneberg & Korsgaard, 2019). The four RPE domains informed the coding framework. Goals were mapped to a corresponding RPE domain and item, referencing specific examples from the RPE. Rigor in coding student goals included cross-checking and consensus discussions among three researchers, supported by an audit trail. When goals bordered more than one domain, a consensus decision prioritized the stronger focus of the goal.

Quantitative data analyses incorporated GAS ratings, RPE evaluation ratings and subsequent placement results. Given the small sample size, descriptive analyses were most appropriate to use alongside qualitative analyses to present patterns identified from the data (Neutens & Rubinson, 2002). Students were stratified by RPE ratings, and the 5-point Likert GAS ratings were re-coded into three zones (below). Notably, GAS rating -2 was not used by students or facilitators.

- "unchanged": GAS rating -1
- "expected": GAS rating 0
- "above": GAS ratings +1 to +2.

WIL academics in each discipline reviewed clinical educators' qualitative comments and quantitative ratings on the clinical assessment tool. They assigned categorical ratings of "strength(s)" or "concern(s)" for each RPE skill domain. If clinical educators did not comment on a skill domain or gave a neutral comment, it was recorded as "no comment(s)/ no concerns." Students' SIM-S goals were then matched with subsequent placement outcomes by skill domain to identify the application of skills learnt in SIM-S to real-life environments.

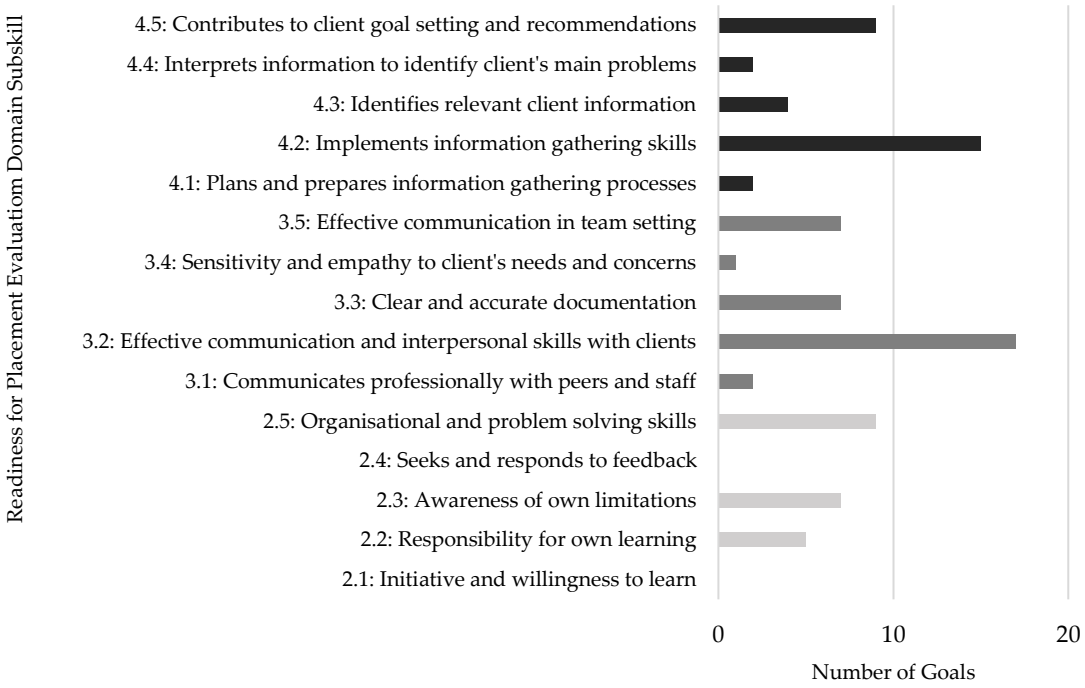
FINDINGS

Of the 24 students who participated in the SIM-S program, 23 students (10 occupational therapy students, 7 physiotherapy students and 6 speech pathology students) met the attendance criterion and consented to participate in this study. The study explored the nature of students' learning outcomes on completion of the SIM-S simulation remediation program. Findings provided insights into the nature of students' remediation goals and the type of goals attained on completion of the program.

Student Learning Goals

Each participant provided three to seven learning goals, with a program total of 87. Overall, 24% of goals focused on learner behavior (n=21), 39% on communication (n=34) and 37% on information gathering (n=32). No students planned professional behavior goals, so this domain is not represented in goal analyses. Figure 2 shows the distribution of students' goals by RPE domain subskills (n=87).

FIGURE 2: Distribution of goals across RPE domain subskills for all learning goal data available (n=87) using domain subskill descriptions summarized from the detailed descriptors in the form.



Note. Subskill descriptions adapted from "Evaluating Allied Health Students' Readiness For Placement Learning" by B. Judd, J. Brentnall, J. N. Scanlan, K. Thomson, F. Blackstock, A. Mandrusiak, L. Chipchase, A. Phillips, & S. McAllister, 2023, *BMC Medical Education, 23*, Article 70. (https://doi.org/10.1186/s12909-023-04005-w). CC BY.

The following Table 1 exemplifies how framework analysis was applied using selected example goals from different RPE domains and subskills.

TABLE 1: Examples of framework analysis applied with goals coded under RPE domains.

RPE Domain	Example of Goals
Learner behavior, domain subskill 2.5	By the end of simulation placement, I will be able to articulate my reasoning of the case to my supervisor in both verbal and written form independently. - O8
Communication, domain subskill 3.2	By the end of the week I will have increased confidence in clearly articulating instructions & cues when conducting an assessment or therapy. - S1
Communication, domain subskill 3.3	By the end of the week, I will be able to complete documentation using SOAP [Subjective, Objective, Assessment, Plan] format in under 10 minutes whilst including all important points for a follow up patient and 20 minutes for an initial patient. - P4
Information gathering, domain subskill 4.2	By the end of 1 week of intensive sim[ulation], I will have implemented appropriate interviewing strategies to ensure that I have collected relevant information about a client, while taking into account their level of comfort. - O1

Note. Each participant is identified by a code representing their discipline and a unique number, where O = occupational therapy, P = physiotherapy, and S = speech pathology.

Student Goal Attainment

Goal attainment scores were compared from the perspectives of the student and facilitator. To compare perspectives of goal attainment, 43 goals with complete data comprised of both student and facilitator GAS ratings were analyzed. Complete data included goals from eight occupational therapy students (23 goals) and five physiotherapy students (20 goals). Within the available data of 87 goals, missing student ratings were from all speech pathology students (28 goals) and one occupational therapy student (4 goals), plus the rating for just one goal of one physiotherapy student (1 goal). The missing facilitator ratings were for all the goals for one student in each discipline (13 goals), plus individual goals for three students (3 goals). Additionally, a "not applicable" rating was used for individual goals for documentation and assessment skills by two occupational therapy and one physiotherapy student (3 goals) and facilitators' rating for two occupational therapy students (2 goals). The relative frequency of learner behavior, communication and information gathering skills were similar between all learning goals (87 goals) and the subset with complete data (43 goals).

Table 2 presents students' goal attainment according to the three RPE skill domains: learner behavior, communication and information gathering. Findings are presented by discipline to summarize individual and group achievement for each goal domain, overall RPE rating, and subsequent placement outcome. The goal outcomes (columns) are grouped by the three GAS Scaling zones and then sorted by goal domain. Facilitator ratings are used where available and unless otherwise noted. Between four students, 10 goals were omitted from Table 2 because neither student nor facilitator ratings were

available, and 2 goals were omitted due to O7 and O8 each having one facilitator rating missing (i.e., 75 goals are presented).

TABLE 2: Summary of students' goal attainment, overall RPE rating and subsequent placement outcome.

Student	Goal Domain and GAS Ratings									Overall RPE Rating	Subsequent Placement Outcome
	Unchanged (GAS = -1)			Expected (GAS = 0)			Above (GAS ≥ 1)				
	LB	C	IG	LB	C	IG	LB	C	IG		
O1								3		Ready	SR
O5								1	2	Ready	SR
O6							3		1	Ready	SR
O8				1	1					Ready	SR
O4			1		2					Remediation prior	SR
O9			1		2					Remediation prior	SR
O10[a]		1			1	1				Remediation prior	SR
O2				2	1				1	Remediation prior	FR
O7	1	1	1							Remediation prior	FR
O3		2	1							Not ready	FR
Subtotal		9			11			11		Discipline's total goals = 31	
P2			2		2					Ready	SR
P3			1		1				1	Ready	SR
P4					1	1	1	1	2	Ready	SR
P5				1		2		1		Ready	SR
P6[a]				1	1	1				Ready	SR
P1	1				1	2				Remediation prior	SR
Subtotal		4			14			6		Discipline's total goals = 24	
S2[c]										Ready	SR
S1[b]				1	1			1	1	Ready	SR
S4[b]				1	1		1			Ready	SR
S6[b]					1		1		2	Ready	SR
S5[b]				1		1	1			Remediation prior	SR
S7[b]			1	1	1					Remediation prior	SR
S3[b]	1	1		1						Remediation prior	FR
Subtotal		3			10			7		Discipline's total goals = 20	
Outcome Total		16			35			24		75	

Note. O = Occupation therapy student, P = Physiotherapy student, S = Speech pathology student, LB = Learner behavior, C = Communication, IG = Information gathering, SR = Satisfied requirements, FR = Failed requirements Facilitators' ratings of goal achievement were used unless specified.

[a] Students' self-ratings were used because these students did not have facilitator ratings.

[b] Student GAS ratings were missing.

[c] Student and facilitator GAS ratings were both missing.

Students presented with diverse goals, but the most frequent goal categories varied by discipline: information gathering in physiotherapy, communication in occupational therapy, and learner behavior in speech pathology.

No students or facilitators evaluated a goal performance to decrease or lapse (GAS = -2). Goals in all domains were most frequently rated with at least expected level of achievement (GAS ≥ 0) by both students and facilitators: learner behavior, 71% by both students and facilitators; communication, 80% and 90% respectively; and information gathering, 69% and 63% respectively.

Table 3 compares student ratings against facilitator ratings using the three zones (unchanged, expected, and above). Findings show students' perceptions of goal attainment often concurred with facilitators' ratings and that differences were balanced except that students' ratings were lower than facilitators' ratings in 40% of communication goals.

TABLE 3: GAS ratings by students in relation to facilitators.

Goal category	Student rating lower than facilitator rating	Student rating equivalent to facilitator rating	Student rating higher than facilitator rating
Learner behavior	29%	42%	29%
Communication	40%	50%	10%
Information gathering	25%	50%	25%

Readiness for Placement Evaluation Ratings

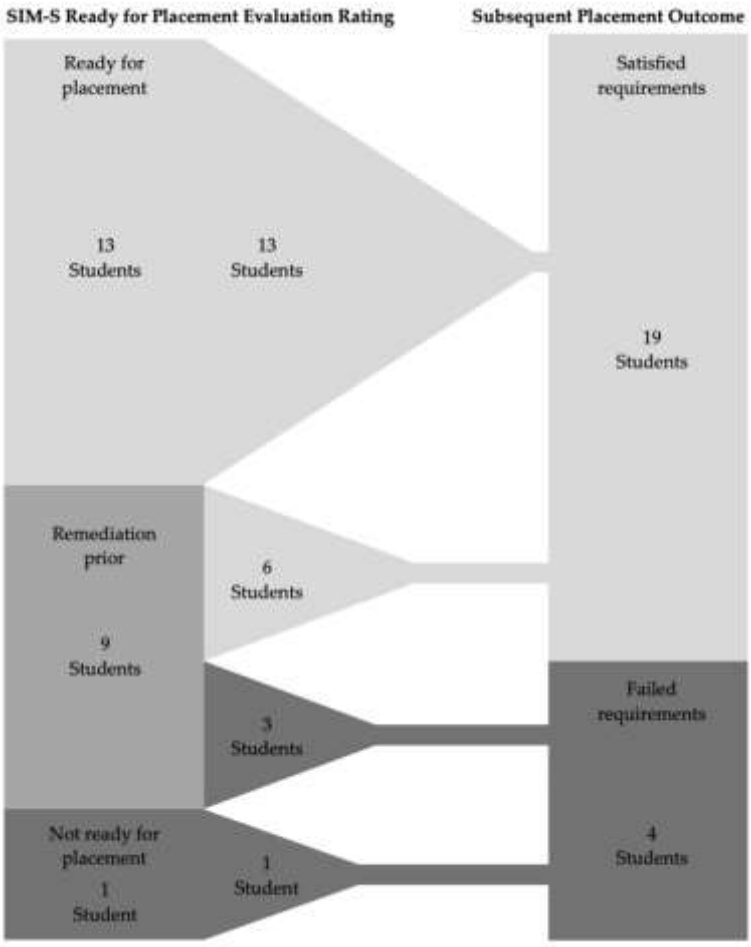
Following SIM-S, facilitators reported 13 students (57%) were ready for placement, nine students (39%) required further remediation, and one student (4%) was not ready for placement.

Ratings of readiness for placement provided further understanding of the impact of the program on students' learning. Comparing the facilitators' GAS ratings and overall RPE rating, if a student had one or more unchanged goals, facilitators were more likely to recommend further remediation than evaluating the student to be ready for placement. Moreover, Table 2 shows that when students' unchanged goals included communication, facilitators recommended further remediation or perceived the student as "not ready for placement."

Subsequent Placement Outcomes

The study also explored students' learning outcomes following participation in the remediation program through the students' next placement outcomes. Placement outcome data included the discipline-specific standardized and national clinical assessment tool used, overall outcome ("satisfied requirements" or "failed requirements"), clinical educator comments (if available) mapped against RPE domain ratings (0: concern(s); 1: no comment(s); 2: strength(s)). After participating in SIM-S, 19 students satisfied placement requirements while four students failed placement requirements. All students rated "ready for placement" in the RPE (n=13), achieved satisfactory outcomes in their subsequent placement. Six of nine students who were recommended remediation post-SIM-S also achieved satisfactory outcomes in their subsequent placement. The one student rated "not ready for placement" at the end of SIM-S failed requirements for their subsequent placement. Figure 3 illustrates the proportion of students who satisfied requirements and failed requirements in their subsequent placement in relation to their SIM-S RPE rating.

FIGURE 3: Proportion of students who satisfied requirements and failed requirements in their subsequent placement in relation to their post-SIM-S RPE rating.



The 19 students who satisfied the requirements of their subsequent placement had a range of goals across all three RPE domains during SIM-S. Thirteen of these students were rated "ready for placement" while six students were recommended "remediation prior." Student O4 had an overall result of "satisfied requirements" included in the data, however, their specific placement assessment did not readily identify strengths and concerns, hence their data was omitted from further analysis in this section. Of the 18 students with data available, clinical educators either perceived students' skills in the three RPE domain areas as a strength or expressed no concern. Clinical educators commented that students demonstrated diverse communication skills, including verbal, non-verbal and written communication. Within SIM-S, simulation facilitators evaluated fifteen of these students either achieving or reaching above expected level in their communication remediation goals, leaving only three students with goals unchanged in areas of information gathering and learner behavior.

The four students who failed to meet the requirements of their subsequent placement also had a range of goals across all RPE domains during SIM-S. Three of these students were recommended further remediation, while one was rated "not ready for placement" in the RPE. At the end of their mediation program, three of the four students had their communication goals rated unchanged by their facilitator,

while one student reached the expected level. Within this failed requirements student group, O2 is an outlier as they had reached expected or above expected levels in all their goals (see Table 2). In subsequent placements, these four students demonstrated strengths in other goal-related areas, such as learner behavior, despite their overall unsatisfactory performance (for example, Occupational Therapy B in Table 4). Table 4 includes examples of clinical educator comments for each skill domain, contrasting the comments received by students achieving or failing requirements in their subsequent placement.

TABLE 4: Examples of clinical educators' assessment comments for students in their subsequent placement following participation in SIM-S.

Rating in RPE Domain	Comment	Student's subsequent placement outcome
Rated learner behavior as a strength	Flourished in area, needs little supervision…able to prioritize and juggle conflicting demands, seeks and applies feedback, but attempts first to problem solve before seeking input – Occupational therapy A	Satisfied requirements
Rated learner behavior as a strength	Consistently punctual, extremely hardworking, diligently completed all extra learning as requested, identifies knowledge/skill gaps and asks for assistance Occupational therapy B	Failed requirements
Rated communication as a strength	Demonstrated at end of placement that she could work holistically with all team members and give accurate and comprehensive verbal and written feedback…[student] cleverly documented and clearly articulated her project to several professionals – Speech pathology	Satisfied requirements
Rated communication with concerns	Not clearly communicating with colleagues, not clarifying his interpretation of others' actions, not actively listening, not communicating challenges in meeting deadlines, inappropriate use of language with clients – Occupational therapy C	Failed requirements
Rated information gathering with no concerns	Able to apply theory to practice, ability to think through problems and asking questions appropriately [sic]– Physiotherapy	Satisfied requirements
Rated information gathering with concerns	Not preparing for session, not researching assessment, needed prompting with reasoning, around tools, questioning and interpretation – Occupational therapy D	Failed requirements

Note. Participant (clinical educators) disciplines rather than identifiers are used to protect anonymity.

DISCUSSION

The simulation remediation program, Simulation for Success (SIM-S), provided an innovative, interprofessional, and authentically active, placement simulation to address areas of concern for students identified as underperforming in clinical placements. Analysis of a suite of outcome measures, including students' learning goals, GAS ratings, RPE ratings and subsequent placement outcomes, indicated a simulation remediation program's ability to address common placement issues, namely, communication skills and student agency (Chernikova et al., 2020; Chipchase et al., 2012; Davenport et

al., 2018; Miller-Rosser et al., 2022). Identification of the nature of students' learning outcomes on completion of SIM-S and following participation in this program will support clinical remediation processes and future implementation of simulation remediation programs.

A Goal-Focused Program

This goal-focused simulation remediation program promoted student agency where they developed and worked on individually prioritized areas within the scope of the program. An expectation for active engagement was clear from the program's outset when students planned and then evaluated their learning (Knowles, 1973) in a program that set them up for success, encouraging self-direction (Clapper, 2010) and fostering students' confidence (Heuer et al., 2022). Simulations tailored to students' individual goals provided this cohort of underperforming allied health students with opportunities to develop a range of skills to achieve learning goals, and practice active workplace-based learning.

Grouping students by learning needs, rather than year group or level of experience, enabled the program to be goal focused. Students presented with diverse goals, but it was notable that the focus of goals varied according to discipline. This pattern may be due to the level of experience of the cohorts most suited to the program (including timing) rather than disciplinary differences per se. Nonetheless, SIM-S also offered interprofessional (Parsell, 1998) and peer learning (Topping, 2005) opportunities. Such opportunities can foster a supportive environment that empowers students to learn with and from peers (Topping, 2005). Interprofessional programs provide students with opportunities for leadership roles, to gain confidence in their own skills, and to assist each other with discipline-specific skills (Boud et al., 2001). As this study included a small group of students, it may be helpful to explore discipline-specific remediation needs in future studies. It is possible the more generic skills of developing student agency (as opposed to more specific profession related skills) can facilitate transferability of knowledge to different contexts.

Skills Developed Through Simulation Remediation

Self-identified goals for remediation based on prior clinical educator feedback to this underperforming, interprofessional student group indicated shortcomings in learner behavior, communication, and information gathering skills. An analysis of the simulation remediation program revealed students achieved over 63% of their goals, providing insights into its short-term outcomes and effectiveness on student learning (Evans & Harder, 2013; Squires et al., 2022). The study's findings underscore the critical role of communication as a threshold skill for achieving success in placements. Students who attained their communication goals demonstrated readiness and higher chances of succeeding in subsequent placements. This finding aligns with prior research, which emphasizes effective communication, alongside knowledge, professionalism, personal attributes, and skills, as a key prerequisite for placement preparedness and overall competency in allied health professions (Chipchase et al., 2012). Additionally, students with communication challenges are perceived as vulnerable clinical learners (Davenport et al., 2018). The findings of this study are consistent with a systematic review (Al-Sheikhly et al., 2020) that demonstrated how effective remediation of communication skills involves early identification, individualized planning, and ongoing assessment with feedback to the student.

Unexpectedly, many students rated their communication goal attainment lower than their facilitators' ratings, particularly when compared to learner behavior and information gathering skills. This disparity highlights the possibility that students may be less confident in their communication. Further research is suggested to explore students' and educators' perceptions of communication skills in allied

health education. In relation to documentation (i.e., written communication), concerns were voiced by both students and facilitators regarding the lack of adequate opportunities for skill development in this domain. Notably, a recent, interprofessional allied health, mixed-methods study (Rossiter et al., 2023) revealed that while simulation provided enhanced occasions for students to apply their knowledge and practice patient communication, online programs showed greater efficacy in improving documentation proficiency. Considering these insights, simulation remedial programs may benefit from integrating online learning opportunities to help develop documentation skills. This integrated approach may enhance the overall effectiveness of the remediation program and foster essential competencies for the allied health professions.

Interestingly, when students' information gathering goals were not achieved this did not impact clinical educator perceptions of students' readiness for placement. Although information gathering involves communication skills, this finding may reflect clinical educators' perceptions that students consolidate discipline-specific knowledge and skills during placement (Chipchase et al., 2012). Across this group, no students chose to focus on goals related to professional behaviors. Perhaps students who volunteered to participate in SIM-S as an extra-curricular learning experience had already achieved a degree of competence and confidence in this area. Nonetheless, during SIM-S professional behaviors were indirectly addressed through modelled and practiced interactions with facilitators, peers, and patients. Simulation remediation with different participants may need to consider how to address professional behavior more directly if this is identified as an area for improvement.

Evaluation of Readiness After Simulation Remediation

Analysis of the subsequent placement outcomes of students indicates that the RPE rating (Judd et al., 2023) was predictive of successful completion of their subsequent placements, thus setting students up for success. The data reveals 82% of students who participated in SIM-S satisfied the requirements of their subsequent placement assessments. Clinical educators reported strengths or no concerns in areas of professional behavior, learner behavior, communication, and information gathering for students who satisfied requirements in their subsequent placement assessments. The findings, supported by Camp and Legge's (2018) research, demonstrate that simulation is an effective strategy for developing clinical competency and the knowledge and skills acquired during remedial simulation can be successfully applied in clinical placements (Heuer et al., 2022; Squires et al., 2022).

On the other hand, clinical educators collectively reported concerns about students' communication skills for those who failed the requirements in their subsequent placement assessments. Three of these four students also showed limited progress during the simulation program, with 66% to 100% of their individual goals, including communication goals, rated as 'unchanged'. This shows the RPE (Judd et al., 2023) to be a relevant measure of outcomes that can complement goal attainment in determining short-term learning outcomes (Evans & Harder, 2013). The RPE tool can also assist clinical educators in guiding students who may require additional support before starting their clinical placements.

Post-Simulation Remediation

When students were recommended to engage in further post-SIM-S remediation, 66% of students achieved a satisfactory outcome in their next placement. It is unclear to what extent these students engaged in self-directed learning or received additional support from their WIL academic or university services, and how this may have contributed to their overall achievement in their subsequent placement. Perhaps simulation facilitators have adopted a conservative approach, and recommended students receive further support to ensure placement readiness. Perhaps SIM-S, as a tailored and authentic

remediation program, may have provided students with insights and learning tools enabling them to continue to develop competence. In future programs, offering individualized and structured post-simulation remediation recommendations to practice before future placements may be beneficial to sustain and further improve these outcomes.

Evaluation of a Simulation Remediation Program's Overall Effectiveness

To objectively assess the effectiveness of remediation through simulation, this study adopted a suite of complementary outcome measures to examine students' learning outcomes. GAS was responsive to small changes and captured student and facilitator perspectives (Kiresuk & Sherman, 1968). Moreover, the collaborative goal setting process ensured goals were meaningful and balanced in complexity and achievability (Sweller, 1988). The RPE was applicable across disciplines and consistent with the aims of SIM-S (Judd et al., 2023). Discipline-specific standardized national clinical assessment tools addressed students' generalization of learning. Findings supported the use of a range of measures to capture student outcomes following remediation. The findings are consistent with Kirkpatrick's model which recommends a sequential approach to comprehensively evaluating a training program's effectiveness, encompassing participants' immediate reactions, and learning outcomes as well as real-world application and broader organizational results (Kirkpatrick, 1996). This study also highlighted the significance of educators' and academics' ongoing reflection and analysis of remediation outcomes from distinct perspectives (Bates, 2004).

Transferability of Skills to Real-Life Application in Clinical Placements

The process of identifying specific learning goals was designed to be reflective and collaborative, with students revisiting previous clinical experiences to inform goals and then receiving feedback from the simulation facilitators. Consistent with adult learning principles, students developed meaningful goals they perceived would support future placement success (Clapper, 2010; Knowles, 1973). Working on their goals, receiving feedback throughout the program, and evaluating their own performance alongside their facilitators enabled students to recognize their strengths (Heuer et al., 2022; Knowles, 1973). Subsequent placement satisfactory outcomes indicate a five-day intensive, interprofessional program provided an effective learning experience for most participants. However, students with significant communication needs may benefit from further support (Chipchase et al., 2012; Davenport et al., 2018).

Considerations in Future Remediation Program Design

There are factors to consider that may have influenced learning success. Students participated in SIM-S during their inter-semester break. Their commitment indicates a high level of motivation to engage in remediation and this may have been an important factor in their successful goal attainment. Another factor is the interprofessional facilitators of the program were clinical educators experienced in managing peer learning and students experiencing challenges in clinical placements. The knowledge and skills of simulation facilitators in building students' competence and confidence along with student motivation cannot be underestimated in simulation remediation programs (Wood et al., 2020).

Remediation is not a one size fits all approach, but this group program benefited most participants. A simulation remediation program focused on developing learner behavior, communication and information gathering skills can assist underperforming students with readiness for clinical practice. Nonetheless, competence is developed on a continuum and some students may not have progressed far enough along the continuum to be ready to succeed in their next placement (L. McAllister &

Nagarajan, 2015). For future implementation of a simulation remediation program, students may need opportunities to develop written communication as it was frequently identified as an area for development by the students and WIL academics (Rossiter et al., 2023). A separate paper in preparation focuses on design and implementation of SIM-S.

LIMITATIONS

Due to small numbers, SIM-S students' outcomes were not analyzed by their level of experience or discipline, rather SIM-S focused on achieving learning goals that were developed according to individual needs. The data analyzed in this study were secondary, as the artifacts and outcomes of the SIM-S program originated from participation in the program or placement (the primary purpose). Their utilization in this study served a secondary purpose, and inevitably limited design choices, data collection methods, interpretive possibilities, and control over missing data. However, the collection of secondary data in this way aimed to alleviate participant burden and minimize power imbalances. The absence of a control, comparison group hinders the establishment of a reference point, making it challenging to distinguish the effects of the intervention conditions from other potential influencing factors. There was missing data in some ratings, but with the multiple data sources, findings still provided important insights into learning outcomes. The suite of outcome measures was selected to provide complementary perspectives, minimize the burden on participants and clinical educators, and maximize the completeness of data (by not introducing additional requirements beyond the program). GAS rating reliability may be improved through specific descriptions for each outcome level, providing training, and using multiple raters.

CONCLUSION

The consequences of underperformance are substantial, resulting in adverse emotional, financial, and social effects for students, educational institutions, and clinical educators (Bearman et al., 2013; Davenport et al., 2018; Evans & Harder, 2013; Gribble et al., 2019). This study supports the overall effectiveness of a simulation remediation program, the importance of communication as a threshold skill, and a remediation program providing the opportunity to build student agency. This remediation strategy can empower students to succeed in upcoming placements and advance as competent allied health professionals, ultimately alleviating negative impacts on all stakeholders.

Future Research

Future research should explore ways to enhance support for specific student subgroups with goals of improving professional behavior. This investigation should extend beyond the current program's scope, addressing documentation and assessment goals not currently covered. Additionally, the research should incorporate comprehensive follow-up data, emphasizing consistent evaluations and feedback from subsequent clinical educators, rather than relying on secondary analyses of discipline-specific clinical assessments. Finally, attention should be given to students' active participation in ongoing learning and self-directed remediation activities between program completion and their subsequent placements, especially those requiring additional remediation beyond the program's provisions. Suggested guiding questions that may facilitate future design and implementation of simulation remediation programs follow in Box 1.

> BOX 1: Practical guiding questions based upon this study's findings that may facilitate future design and implementation of simulation remediation programs.

- What remediation practices do I currently use to support my underperforming students in work-integrated learning?
- How will I support students in bridging the perceived gap between academic learning and clinical learning?
- Do I have a safe environment for students to have an active role in planning, developing, reflecting, and evaluating their skills?
- How can I engage my students to take on an active role in their remedial process?
- What strategies will my underperforming students use to prepare for their next clinical placement?
- Have I considered opportunities for students to practice their communication with peers, supervisors, and patients in a clinical setting?
- How will I provide opportunities for peer learning and interprofessional practice?
- Have I thought holistically about the outcomes of a simulation remediation program and how students will transfer their skills to future placements?
- What suite of measures will I use to evaluate the short term and long-term outcomes of my simulation remediation program?

ACKNOWLEDGEMENTS

The authors appreciate the students who provided consent to participate in this study. We thank the host University for funding the Simulation for Success (SIM-S) remediation program.

REFERENCES

Al-Sheikhly, D., Östlundh, L., & Arayssi, T. (2020). Remediation of learners struggling with communication skills: A systematic review. *BMC Medical Education, 20,* Article 215.https://doi.org/10.1186/s12909-020-02074-9

Alzayyat, A., & Al-Gamal, E. (2014). A review of the literature regarding stress among nursing students during their clinical education. *International Nursing Review, 61*(3), 406–415. https://doi.org/10.1111/inr.12114

Attrill, S., McAllister, S., & Lincoln, M. (2016). Predictors of professional placement outcome: Cultural background, English speaking and international student status. *Perspectives on Medical Education, 5*(4), 222–230. https://doi.org/10.1007/s40037-016-0289-x

Barab, S., & Squire, K. (2004). Design-based research: Putting a stake in the ground. *Journal of the Learning Sciences, 13*(1), 1–14. https://doi.org/10.1207/s15327809jls1301_1

Bates, R. (2004). A critical analysis of evaluation practice: The Kirkpatrick model and the principle of beneficence. *Evaluation and Program Planning, 27*(3), 341–347. https://doi.org/10.1016/j.evalprogplan.2004.04.011

Bearman, M., Molloy, E., Ajjawi, R., & Keating, J. (2013). "Is there a plan B?": Clinical educators supporting underperforming students in practice settings. *Teaching in Higher Education, 18*(5), 531–544. https://doi.org/10.1080/13562517.2012.752732

Berragan, L. (2011). Simulation: An effective pedagogical approach for nursing? *Nurse Education Today, 31*(7), 660–663. https://doi.org/10.1016/j.nedt.2011.01.019

Boud, D., Cohen, R., & Sampson, J. (2001). *Peer learning in higher education: Learning from and with each other.* Taylor and Francis. https://doi.org/10.4324/9781315042565

Bourne, E., McAllister, L., Kenny, B., & Short, K. (2020). Speech pathologists' perceptions of the impact of student supervision. *International Journal of Practice-Based Learning in Health and Social Care, 8*(2), 1–15. https://doi.org/https://doi.org/10.18552/ijpblhsc.v8i2.549

Camp, S., & Legge, T. (2018). Simulation as a tool for clinical remediation: An integrative review. *Clinical Simulation in Nursing, 16*, 48–61. https://doi.org/10.1016/j.ecns.2017.11.003

Chapleau, A., & Harrison, J. (2015). Fieldwork I program evaluation of student learning using goal attainment scaling. *American Journal of Occupational Therapy, 69*(Suppl. 2), 6912185060p1-6912185060p8. https://doi.org/10.5014/ajot.2015.018325

Chernikova, O., Heitzmann, N., Stadler, M., Holzberger, D., Seidel, T., & Fischer, F. (2020). Simulation-based learning in higher education: A meta-analysis. *Review of Educational Research, 90*(4). https://doi.org/10.3102/0034654320933544

Chipchase, L. S., Buttrum, P. J., Dunwoodie, R., Hill, A. E., Mandrusiak, A., & Moran, M. (2012). Characteristics of student preparedness for clinical learning: Clinical educator perspectives using the Delphi approach. *BMC Medical Education, 12,* Article 112. https://doi.org/10.1186/1472-6920-12-112

Clapper, T. C. (2010). Beyond Knowles: What those conducting simulation need to know about adult learning theory. *Clinical Simulation in Nursing, 6*(1), e7–e14. https://doi.org/10.1016/j.ecns.2009.07.003

Cleland, J. A., Knight, L. V., Rees, C. E., Tracey, S., & Bond, C. M. (2008). Is it me or is it them? Factors that influence the passing of underperforming students. *Medical Education, 42*(8), 800–809. https://doi.org/10.1111/j.1365-2923.2008.03113.x

Creswell, J. W., & Plano Clark, V. L. (2017). Analyzing and interpreting data in mixed methods research. In J.W. Creswell & V. L. Plano Clark (Eds.), *Designing and conducting mixed methods research* (3rd ed., pp. 203-250). Sage Publications.

Culleiton, A. L. (2009). Remediation: A closer look in an educational context. *Teaching and Learning in Nursing, 4*(1), 22–27. https://doi.org/10.1016/j.teln.2008.07.001

Dalton, M., Keating, J., Davidson, M., & Alexander, H. (2009). *Development of the APP (Assessment of Physiotherapy Practice) instrument: A standardised and valid approach to assessment of clinical competence in physiotherapy*. Australian Learning and Teaching Council.

Davenport, R., Hewat, S., Ferguson, A., McAllister, S., & Lincoln, M. (2018). Struggle and failure on clinical placement: A critical narrative review. *International Journal of Language and Communication Disorders, 53*(2), 218–227. https://doi.org/10.1111/1460-6984.12356

Division of Occupational Therapy. (2008). *Student practice evaluation form-Revised edition (SPEF-R).* University of Queensland.

Evans, C. J., & Harder, N. (2013). A formative approach to student remediation. *Nurse Educator, 38*(4), 147–151.

Gale, N. K., Heath, G., Cameron, E., Rashid, S., & Redwood, S. (2013). Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Medical Research Methodology, 13,* Article 117. . https://doi.org/10.1186/1471-2288-13-117

Gribble, N., Ladyshewsky, R. K., & Parsons, R. (2019). The impact of clinical placements on the emotional intelligence of occupational therapy, physiotherapy, speech pathology, and business students: A longitudinal study. *BMC Medical Education, 19*, Article 90. https://doi.org/10.1186/s12909-019-1520-3

Harmon, K. S., Gonzales, A. D., & Fenn, N. E. (2021). Remediation and reassessment methods in pharmacy education: A systematic review. *Currents in Pharmacy Teaching and Learning 13*(1), 81-90. https://doi.org/10.1016/j.cptl.2020.07.005

Haskvitz, L. M., & Koop, E. C. (2004). Students struggling in clinical? A new role for the patient simulator. *Journal of Nursing Education, 43*(4), 181–184. https://doi.org/10.3928/01484834-20040401-06

Heuer, A., Bienstock, J., & Zhang, Y. (2022). Simulation-based training within selected allied health professions: An evidence-based systematic review. *Journal of Allied Health, 51*(1), 59–71.

Hill, A. E., Ward, E., Heard, R., McAllister, S., McCabe, P., Penman, A., Caird, E., Aldridge, D., Baldac, S., Cardell, E., Davenport, R., Davidson, B., Hewat, S., Howells, S., Purcell, A., & Walters, J. (2021). Simulation can replace part of speech-language pathology placement time: A randomised controlled trial. *International Journal of Speech-Language Pathology, 23*(1), 92-102. https://doi.org/10.1080/17549507.2020.1722238

Immonen, J. A., Richardson, S. J., Sproul Bassett, A. M., Garg, H., Lau, J. D., & Nguyen, L. M. (2023). Remediation practices for health profession students and clinicians: An integrative review. *Nurse Education Today*, *127,* Article 105841. https://doi.org/10.1016/j.nedt.2023.105841

Imms, C., Froude, E., Chu, E. M. Y., Sheppard, L., Darzins, S., Guinea, S., Gospodarevskaya, E., Carter, R., Symmons, M. A., Penman, M., Nicola-Richmond, K., Gilbert Hunt, S., Gribble, N., Ashby, S., & Mathieu, E. (2018). Simulated versus traditional occupational therapy placements: A randomised controlled trial. *Australian Occupational Therapy Journal, 65*(6), 556–564. https://doi.org/10.1111/1440-1630.12513

Judd, B., Brentnall, J., Scanlan, J. N., Thomson, K., Blackstock, F., Mandrusiak, A., Chipchase, L., Phillips, A., & McAllister, S. (2023). Evaluating allied health students' readiness for placement learning. *BMC Medical Education, 23*, Article 70. https://doi.org/10.1186/s12909-023-04005-w

Kiresuk, T. J., & Sherman, R. E. (1968). Goal attainment scaling: A general method for evaluating comprehensive community mental health programs. *Community Mental Health Journal, 4*, 443–453. https://doi.org/10.1007/BF01530764

Kirkpatrick, D. (1996). Great ideas revisited. Techniques for evaluating training programs. Revisiting Kirkpatrick's four-level model. *Training & Development, 50*(1), 54–59.

Knowles, M. (1973). *The adult learner: A neglected species*. Gulf Publishing.

Koski, J., & Richards, L. G. (2015). Reliability and sensitivity to change of goal attainment scaling in occupational therapy non classroom educational experiences. *American Journal of Occupational Therapy*, 69(S2) https://doi.org/10.5014/ajot.2015.016535

Linneberg, M. S., & Korsgaard, S. (2019). Coding qualitative data: A synthesis guiding the novice. *Qualitative Research Journal, 19*(3), 259–270. https://doi.org/10.1108/QRJ-12-2018-0012

Makhani, L., Bradley, R., Wong, J., Krynski, E., Jarvis, A., & Szumacher, E. (2012). A framework for successful remediation within allied health programs: Strategies based on existing literature. *Journal of Medical Imaging and Radiation Sciences, 43*(2), 112-120.https://doi.org/10.1016/j.jmir.2011.12.006

McAllister, L., & Nagarajan, S. (2015). Accreditation requirements in allied health education: Strengths, weaknesses and missed opportunities. *Journal of Teaching and Learning for Graduate Employability, 6*(1), 2-23. https://doi.org/10.21153/jtlge2015vol6no1art570

McAllister, S., Lincoln, M., Ferguson, A., & McAllister, L. (2013). COMPASS® *: Competency assessment in speech pathology assessment resource manual: excerpt professional competencies* (2nd ed.). Speech Pathology Australia.

Miller-Rosser, K., Fielden, J., & Colgrave, J. (2022). Issues with health student pre-placement clinical compliance: A mixed methods study. *Australian Journal of Clinical Education, 11*(2), 125-138. https://doi.org/10.53300/001c.38067

Neutens, J., & Rubinson, L. (2002). *Research techniques for the health sciences* (3rd ed.). Benjamin Cummings.

O'Connor, T. (2014). The role of simulation in nursing education. *Kai Tiaki: Nursing New Zealand, 20*(1), 11–13.

Park, S. K., Daugherty, K. K., Chen, A. M. H., & Fettkether, R. M. (2022). Considerations for remediation policy and procedures in pharmacy education. *Currents in Pharmacy Teaching and Learning, 14*(5), 547-551. https://doi.org/10.1016/j.cptl.2022.04.014

Parsell, G. (1998). Interprofessional learning. *Postgraduate Medical Journal*, *74*(868), 89-95. https://doi.org/10.1136/pgmj.74.868.89

Richmond, K., Richards, K., & Britt, K. (2015). The impact of an authentic, simulated learning activity on student preparedness for work-integrated learning. *International Journal of Work-Integrated Learning, 16*(4), 343–354.

Rossiter, L., Turk, R., Judd, B., Brentnall, J., Grimmett, C., Cowley, E., McCormick, K., & Thackray, D. (2023). Preparing allied health students for placement: a contrast of learning modalities for foundational skill development. *BMC Medical Education, 23,* Article 161. https://doi.org/10.1186/S12909-023-04086-7

Squires, K., Heaney, S., Macdonald-Wicks, L., Johnston, C., & Brown, L. (2022). Mapping simulated-based learning experiences incorporated into professional placements in allied health programs: A scoping review. *Simulation in Healthcare, 17*(6), 403-415.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12*(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4

Topping, K. J. (2005). Trends in peer learning. *Educational Psychology, 25*(6), 631–645. https://doi.org/10.1080/01443410500345172

Twomey, P., & Pretti, T. J. (2023). Organizational theory: Leveraging its explanatory potential for work-integrated learning. In K. E. Zegwaard & T. J. Pretti (Eds.), *The Routledge international handbook of work-integrated learning* (3rd ed., pp. 73–90). Routledge. https://doi.org/10.4324/9781003156420

Vacha-Haase, T., Elman, N. S., Forrest, L., Kallaugher, J., Lease, S. H., Veilleux, J. C., & Kaslow, N. J. (2019). Remediation plans for trainees with problems of professional competence. *Training and Education in Professional Psychology, 13*(4),239-246. https://doi.org/10.1037/tep0000221

Watson, K., Wright, A., Morris, N., Mcmeeken, J., Rivett, D., Blackstock, F., Jones, A., Haines, T., O'Connor, V., Watson, G., Peterson, R., & Jull, G. (2012). Can simulation replace part of clinical time? Two parallel randomised controlled trials. *Medical Education, 46*(7), 657–667. https://doi.org/10.1111/j.1365-2923.2012.04295.x

Wisdom, J., & Creswell, J. W. (2013). *Mixed methods: Integrating quantitative and qualitative data collection and analysis while studying patient-centered medical home models*. Agency for Healthcare Research and Quality.

Wood, Y. I., Zegwaard, K. E., & Fox-Turnbull, W. (2020). Conventional, remote, virtual and simulated work-integrated learning: A meta-analysis of existing practice. *International Journal of Work-Integrated Learning, 21*(4), 331–354.

Zegwaard, K. E., Pretti, T. J., Rowe, A. D., & Ferns, S. J. (2023). Defining work-integrated learning. In K. E. Zegwaard & T. J. Pretti (Eds.), *The Routledge international handbook of work-integrated learning* (3rd ed., pp. 29–48). Routledge. https://doi.org/10.4324/9781003156420

International Journal of Work-Integrated Learning
ISSN: 2538-1032
www.ijwil.org

About the Journal

The International Journal of Work-Integrated Learning (IJWIL) publishes double-blind peer-reviewed original research and topical issues related to Work-Integrated Learning (WIL). IJWIL first published in 2000 under the name of Asia-Pacific Journal of Cooperative Education (APJCE).

In this Journal, WIL is defined as:

> *An educational approach involving three parties – the student, educational institution, and an external stakeholder – consisting of authentic work-focused experiences as an intentional component of the curriculum. Students learn through active engagement in purposeful work tasks, which enable the integration of theory with meaningful practice that is relevant to the students' discipline of study and/or professional development* (Zegwaard et al., 2023, p. 38*).

Examples of practice include off-campus workplace immersion activities such as work placements, internships, practicum, service learning, and cooperative education (co-op), and on-campus activities such as work-related projects/competitions, entrepreneurships, student-led enterprise, student consultancies, etc. WIL is related to, and overlaps with, the fields of experiential learning, work-based learning, and vocational education and training.

The Journal's aim is to enable specialists working in WIL to disseminate research findings and share knowledge to the benefit of institutions, students, WIL practitioners, curricular designers, and researchers. The Journal encourages quality research and explorative critical discussion that leads to the advancement of quality practices, development of further understanding of WIL, and promote further research.

The Journal is financially supported by the Work-Integrated Learning New Zealand (WILNZ; www.wilnz.nz), and the University of Waikato, New Zealand, and receives periodic sponsorship from the Australian Collaborative Education Network (ACEN), University of Waterloo, and the World Association of Cooperative Education (WACE).

Types of Manuscripts Sought by the Journal

Types of manuscripts sought by IJWIL is of two forms: 1) *research publications* describing research into aspects of work-integrated learning and, 2) *topical discussion* articles that review relevant literature and provide critical explorative discussion around a topical issue. The journal will, on occasions, consider good practice submissions.

Research publications should contain; an introduction that describes relevant literature and sets the context of the inquiry. A detailed description and justification for the methodology employed. A description of the research findings - tabulated as appropriate, a discussion of the importance of the findings including their significance to current established literature, implications for practitioners and researchers, whilst remaining mindful of the limitations of the data, and a conclusion preferably including suggestions for further research.

Topical discussion articles should contain a clear statement of the topic or issue under discussion, reference to relevant literature, critical and scholarly discussion on the importance of the issues, critical insights to how to advance the issue further, and implications for other researchers and practitioners.

Good practice and program description papers. On occasions, the Journal seeks manuscripts describing a practice of WIL as an example of good practice, however, only if it presents a particularly unique or innovative practice or was situated in an unusual context. There must be a clear contribution of new knowledge to the established literature. Manuscripts describing what is essentially 'typical', 'common' or 'known' practices will be encouraged to rewrite the focus of the manuscript to a significant educational issue or will be encouraged to publish their work via another avenue that seeks such content.

By negotiation with the Editor-in-Chief, the Journal also accepts a small number of *Book Reviews* of relevant and recently published books.

Reference
Zegwaard, K. E., Pretti, T. J., Rowe, A. D., & Ferns, S. J. (2023). Defining work-integrated learning. In K. E. Zegwaard & T. J. Pretti (Eds.), *The Routledge international handbook of work-integrated learning* (3rd ed., pp. 29-48). Routledge. https://doi.org/10.4324/9781003156420-4

International Journal of Work-Integrated Learning
ISSN: 2538-1032
www.ijwil.org

Publisher: Work-Integrated Learning New Zealand (WILNZ)
www.wilnz.nz