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Abstract

Introduction: Work-integrated learning (WIL) is integral to exercise science degrees, but clinical educators report low motivation and limited professional competency in students. WIL may be enhanced by first building professional capabilities in a University-based setting. As such, this study investigated whether participation in a student-led virtual exercise clinic improved perceived professional self-efficacy, as well as intrinsic motivation.

Methods: A prospective, repeated-measures cohort design. Exercise Science Practicum students (N= 20) delivered a six-week virtual exercise program. Outcomes of interest included changes in client-related skills confidence (e.g. interpersonal skills) and perceived participation benefits and motivation ($p < 0.05$).

Results: Seventeen students (85%) completed the survey, reporting significant improvement (Z= -3.18) in confidence related to client communication skills. Additionally, students reported significantly higher perceived truthfulness of statements in the intrinsic motivation subscales: interest-enjoyment (Z= -2.77); perceived competency (Z= -2.80); and value-usefulness for the development of communication skills (Z= -2.33).

Discussion: Participation in a virtual student-led exercise clinic enhanced confidence in client-related communication skills, as well as multiple intrinsic motivation domains. With an increased need for developing student competency and motivation for WIL, virtual student-led clinics may prove a novel enabler.

I INTRODUCTION

Work-integrated learning (WIL) is an integral aspect of most health degrees, including exercise and sports science. Such an experience offers students an opportunity to translate theoretical and classroom-based knowledge into professional practice. However, for many students this practical placement is their first work experience in the field. Survey feedback from clinical educators has highlighted a growing unwillingness to provide WIL opportunities, particularly to students undertaking their first placement. Clinical educators reported students often struggle to engage in the experience and may display limited skills in areas such as history taking, communication and client interaction, resulting in unwillingness to provide work-integrated learning opportunities (Sealey et al., 2015). As such, it is imperative to ensure that students are motivated and feel prepared to undertake their industry placements.

Previous research suggests providing students with opportunities to undertake personal growth and develop professional self-efficacy can enhance their WIL experience (Kolb & Kolb, 2005). Further, a survey by Jackson (2015) found that, while students reported the irreplaceable benefits of WIL for skills development, a majority also benefited from having some foundational capabilities developed first in a University-based setting, which were then built on during their industry practicum. One method to address these concerns and improve student preparedness may be the use of University-based student-led clinics. Student-led clinics are similar to a traditional practicum placement in that students are overseen by a qualified practitioner; however, this structure is founded on students developing resources and driving provision of client services (Buchanan et al., 2006). Ramsden (2003) suggests that there is a pedagogical advantage to student-led clinics in that they promote independence and critical thinking, in addition to improved communication, collaboration and leadership skills (Horstmanshof et al., 2016; Kirkpatrick & Kirkpatrick, 2006). Medical education, particularly in relation to medicine and nursing, have long reported significant educational benefits accrued from participation in student-led clinics (Simpson & Long, 2007). Such experiences provide a unique “learning by doing” opportunity outside of industry-based placement (Schutte et al., 2015, p. 250). Further, Black et al. (2013) reported a positive experience for physiotherapy students linked to the development of leadership skills, competency, and commitment, through WIL in a pro-bono student-led clinic. However, there is a research gap in relation to student-led clinics providing exercise science services.

Further, with the health industry constantly evolving and expanding, there is an increasing need for service access to expand and adapt as well. For example, there is now a need to develop technology-competent practitioners (Conde et al., 2010). Provision of telehealth sessions reduces commonly perceived barriers such as time and service access (Bull et al., 2016), as well as expands a health professional’s potential client base. When looking at student perception of engaging in telehealth session delivery, Glinkowski et al. (2013) surveyed 308 undergraduate nursing students and found that 66% of respondents reported that they would definitely use a telehealth device in their future careers as nurses, and 70% believed that telenursing should be incorporated into the educational curriculum.

No studies were found, however, in relation to the virtual delivery of exercise science services. As such, the aims of this study were to investigate exercise science students’ perception of participating in a virtually delivered student-led exercise program. Specifically, this study investigated whether participation improved the students’ perceived professional self-efficacy and industry readiness. Additionally, the study sought to determine whether program participation was associated with changes in multiple domains related to intrinsic motivation.

II METHODS

A *Trial design*

This study piloted a pre-post, single group uncontrolled trial to collect data before and after a six-week student-led virtual exercise program. Ethical approval was provided by the Griffith University Human Research Ethics Committee (GU Ref No: 2020/276).

B *Participants*

All undergraduate students enrolled in the 2020 Trimester 1 offering of the Exercise Science Practicum course within the Bachelor of Exercise Science program at Griffith University were invited to participate in this study (*N*=20). Inclusion criteria, in addition to course enrolment, included involvement in delivering a six-week virtual group exercise program. A study information sheet and pre- and post-program online survey was provided to eligible students, with completion outlined as implied consent. Students were not graded based on participation but were allowed to record program hours towards their mandatory 140 hours required for professional exercise science accreditation. The GREET checklist (Phillips et al., 2016) was used to design and implement the learning initiative, which is outlined below.

C *Learning activity*

The exercise delivery activity undertaken involved weekly development and delivery of virtual group exercise sessions. Students were required to design an adaptable, home-based weekly exercise session, with the following components: 1) Progressed and regressed exercise options; 2) Workout video for clients to access as desired; 3) Written outline of session; and 4) Live virtual delivery of session once a week for six weeks. Each of the six weeks required students to design a different type of 30-minute session, such as a partner workout, timed intervals, and an “As Many Rounds As Possible” session.

Weekly live virtual sessions (free service) were delivered to actual clients who were not previously known to the students, with participants required to be classified as ‘apparently healthy’ to ensure students were working within the exercise science scope of practice. As such, all client pre-screens were conducted by an Accredited Exercise Physiologist to comply with scope of practice and insurance requirements. Once deemed suitable for participation, clients completed a waiver form, and physical location of all session participants was obtained during each live session to ensure safety and enable emergency services dispatch if required. While students did not directly undertake these initial pre-screenings, they were responsible for subjectively screening all participants at the start of each session (e.g. ‘How are you feeling today?’; ‘Do you have any current injuries or issues?’). All sessions were virtually overseen by one of two clinical educators, both Accredited Exercise Physiologists with at least one year of clinical education experience. No control group existed, with all enrolled students participating in the educational initiative.

Throughout the six-week program, students worked with a partner to develop resources and deliver the live session. All live sessions were delivered using Zoom, and students were provided with performance feedback during and following each session from the clinical educator. Additionally, students undertook a weekly planning session with the course convenor, who was also one of the supervising clinical educators, via Microsoft Teams to discuss the following week’s session plan and clinical reasoning behind structure and included movements. Throughout the six weeks, students were encouraged to attend peers’ sessions to increase understanding of session structure and expose themselves to various delivery approaches. Further, in the final two

weeks of the program each student was required to attend a peer's session and provide feedback on the session and related resources developed.

D *Outcome measures*

A custom-designed evaluation was administered via Microsoft Forms at two timepoints, pre- and post-program participation. The surveys were structured off previous research that evaluated students' pre- and post-participation in simulated learning activities (Reeves et al., 2019) and were comprised of published and custom-designed measures of student perceptions according to the learning and reaction levels of Kirkpatrick and Kirkpatrick's (2006) evaluation of training programs.

Here, the study outcomes of interest were the students' self-rated confidence in client-related skills (e.g. using interpersonal skills, explaining professional role), perceived motivation for learning and perception of benefits of participation in a virtual program. The "Self-confidence in Professional Skills" questionnaire provided a foundation for assessing perceived client-related skills in the area of communication, which is a 13-item survey previously used and found to be reliable (Cronbach's α=0.77 to 0.9)in studies of simulation-based learning in physiotherapy education (Blackstock et al., 2013; Watson et al., 2012). The original questionnaire comprised of 13 items used to measure students' confidence in client-related skills in the areas of communication, assessment, and management. For this study, the communication-related items of the questionnaire were utilised and adapted to result in 11 questions (Appendix A) aligning with the learning outcomes associated with the learning activities. While the original questionnaire included 'interpersonal skills' as a single item, but in respect to seven different areas (e.g. eye contact, language, summarising/confirming understanding) (original survey available in Watson et al., 2012), this study expanded that item into seven individual survey questions. Statements were introduced by "I feel confident in my ability to…" and responses were based on a 5-point Likert scale (1=strongly disagree and 5=strongly agree). The 11 items were averaged to determine a single score, for a total score ranging from 11 to 55.

An adapted version of the Intrinsic Motivation Inventory (IMI) (Ryan, 1982), administered pre- and post-program, was used to measure learners' motivation for undertaking the activity, as well as perceived benefits of participation. While the full 'Post-experimental Intrinsic Motivation Inventory' (Center for Self-Determination Theory (CSDT), n.d.) has 45 items comprising seven subscales, the scale is rarely used in original form and is commonly adapted to research (McAuley et al., 1989). The adapted version in this study (Appendix B, pre-program survey) contained five of the seven subscales: interest-enjoyment, perceived competence, effort, pressure-tension and value-usefulness. However, there were 44 total items, as value-usefulness formed three unique subscales, separately assessing development of communication skills, programming skills and client management skills. The other four subscales (interest-enjoyment, perceived competence, effort, pressure-tension) have demonstrated acceptable internal consistency, with Cronbach's α=0.68 to 0.84, (McAuley et al., 1989). No data could be found on psychometric properties of the value-usefulness subscale. Wording for all items was adjusted to measure pre- versus post-program perceptions, such as, "I will put a lot of effort into this" changed to "I put a lot of effort into this." Item response used a 7-point Likert scale in relation to perceived truthfulness of each statement (1 = not at all, 4 = somewhat, 7 = very true). To score the IMI, all negatively worded statements in the questionnaire were inversely translated by subtracting the participant's score from eight (CSDT, n.d.). The exception was for items within the pressure-tension scale, whereby positively worded questions were inversely translated to reflect higher score as corresponding with greater perceived pressure-tension. Average score for each of the seven subscales was then calculated for each participant, as well as group mean scores for each subscale.

E *Analyses*

Repeated measures tests were used to determine change in confidence related to client communication skills, perceived motivation for learning and perception of benefits of participation in a virtual program from pre- to post-program participation. Prior to these analyses, tests of normality were undertaken on each variable. Paired-sample t-tests or the non-parametric equivalent (Wilcoxon signed-rank tests) were conducted to determine a change in outcome variables following program participation. Descriptive statistics, specifically mean and standard deviation (parametric) or median and inter-quartile range (IQR; non-parametric), were used to summarise the scores for the students' perceived professional skills and benefits of program participation. All statistical analyses were conducted with IBM SPSS Statistics, Version 26 software (SPSS Inc, IL). The significance level for all analyses was set at $p < 0.05$.

III RESULTS

Seventeen of the 20 eligible students (85%) completed the survey. There were ten males and seven females, averaged 23.8 years of age (SD=3.3, range=21-31 years). Only one participant (5%) reported previous experience delivering virtual exercise programs, which occurred in her role as a personal trainer outside of University. No students reported experience in virtual exercise programs as part of a University activity.

A *Change in confidence*

Analyses showed significant improvement (Z= -3.18; $p < 0.05$) in overall confidence related to client communication skills from pre- to post-program participation (median [IQR]: 43.00 [38.00-44.50] vs 53.00 [44.00-55.00], respectively). Scores related to each of the eleven individual items included in overall communication score also improved from pre- to post-program participation (data not shown).

B *Motivation for learning*

Table 1 presents change in overall score across the seven IMI subscales from pre- to post-program. By program completion, participants reported a significantly higher perceived truthfulness for statements in the following subscale: interest-enjoyment (Z= -2.77); perceived competence (Z= -2.80); and value-usefulness for the development of communication skills (Z= -2.33). There were non-significant improvements in effort, pressure-tension, value-usefulness for the development of programming skills and value-usefulness for the development of client management skills.

C *Program changes and evaluation*

All 17 students delivered their allocated sessions for the entire six-week study duration. There were no planned changes made to the program. One unplanned change was implemented, related to session design. After the initial three weeks of delivery, students were given a list of 'off-limits' exercises (e.g. standard push-ups, bodyweight squats) to encourage increased programming ability and movement knowledge. To ensure supervision consistency between clinical educators and that the program was meeting learning objectives, weekly discussions were held between educators.

Table 1.
Intrinsic Motivation Inventory (IMI) subscale results pre- and post-participation in virtual exercise program

Subscale	Pre-program Median (IQR)	Post-program Median (IQR)	Comparison Z (p-value)
Interest-enjoyment	37.00 (32.00-39.50)	44.00 (40.50-48.00)	-2.77*
Perceived competence	28.00 (26.00-32.00)	35.00 (29.50-37.00)	-2.80*
Effort	31.00 (24.50-33.50)	30.00 (29.00-34.00)	-0.41
Pressure-tension	24.00 (21.50-25.00)	25.00 (21.50-27.00)	-1.09
Value-usefulness: communication	41.00 (35.50-46.00)	49.00 (42.00-49.00)	-2.33*
Value-usefulness: programming	37.00 (35.00-42.00)	42.00 (38.00-49.00)	-1.73
Value-usefulness: client management	42.00 (37.00-47.50)	47.00 (40.50-49.00)	-0.90

* $p<0.05$

IIII DISCUSSION

Following six weeks of participation in a virtual student-led exercise clinic, students reported improved communication confidence and ability to interact as professionals. Additionally, they reported an increase in various domains of the IMI, specifically interest-enjoyment, perceived competency and value-usefulness in relation to communication skills. No statistically significant changes were observed in effort, pressure-tension, value-usefulness for programming skills or value-usefulness for client management skills. These findings add to the increasing body of evidence supporting student-led client service initiatives as valuable activities for developing student confidence and perceived professional readiness.

Unique to this research was the use of a student-led clinic in an exercise science setting, in which students worked with non-clinical populations (i.e. delivering general fitness sessions). While student-led clinics are utilised in various healthcare-related degrees, such as medicine, physiotherapy and kinesiology (Black et al., 2013; Bostick et al., 2014; Schutte et al., 2015; Simpson & Long, 2007), these all involved working with clinical populations and often in a multidisciplinary setting. Even in a novel setting, our study reported similar benefits of participation as those reported in other disciplines. For example, a recent study by Hamilton et al. (2019) conducted qualitative interviews in ten midwifery students, noting emerging themes of improved professional knowledge, skills and confidence in communicating with and supporting clients. While perceived confidence may not directly indicate competence (Eva & Regehr, 2005; Wright et al., 2018), it has been associated with an enhanced motivation to learn and apply professional skills (Mann & Eland, 2005; Vancouver & Kendall, 2006). This was reflected in our study by improvements across various domains of the IMI, including in interest-enjoyment and value-usefulness of participation in relation to programming skills. These observed improvements in relation to communication, both related to value-usefulness of activity participation and overall communication confidence are essential to industry success. Colleague and client communication have shown to underpin client-centred care (Chester et al., 2014) and strongly link to client satisfaction (Hush et al., 2011; Waters et al., 2016) in the health setting.

Additionally, a novel aspect of this study was virtual delivery of the student-led exercise service. There is a growing need to develop technology-competent practitioners (Conde et al., 2010), in part due to telehealth use reducing barriers such as time and service access (Bull et al., 2016). Research by Glinkowski et al. (2013) in nursing students highlights student support of incorporating telehealth training into University curriculum. However, as suggested by

baseline average IMI scores related to interest-enjoyment, perceived competence and pressure-tension, virtual delivery without training may present a significant perceived challenge and anxiety for students. Only one student in this study reported previous experience with telehealth, reporting high motivation and confidence in use from baseline. This new form of service delivery may, in part, explain changes observed from pre- to post-participation across multiple variables. For example, students reported higher self-efficacy for all professional skills following participation. This is in line with previous research by Kolb and Kolb (2005) suggesting WIL can be enhanced by offering learning opportunities that promote growth-producing experiences. Further, students did not report an improved value-usefulness in relation to the activity developing programming or client management skills. It is feasible this was influenced by students creating and delivering a group-based session, and therefore, not working directly one-on-one with a client to personalise programs and manage their case.

While participation in a virtual, student-led exercise clinic benefited the students' rating of professional confidence, future research should integrate a quantitative assessment of skill competency to provide a more nuanced understanding of these findings (Blum et al., 2010; Laschinger et al., 2008), as well as collect qualitative feedback from student and client participants. This research was designed as a pilot study and used a convenience sample, but future study should deliver such a program as a randomised controlled trial to provide greater information on areas such as influence of other University courses. Additional research could also measure correlations between student confidence associated with University-based activities and future external practicum confidence and performance. Also, as the study data were collected immediately post-program participation, a follow-up survey after a period of time would better enable an evaluation of sustained changes. This is important because the majority of the participants had six or more months until graduation and potentially entering the industry workforce. As such, any acute improvements in confidence would be most beneficial if they were maintained or, even further enhanced over time. Further research is warranted in relation to intrinsic motivation factors, particularly in relation to sustainability and transferability. As program participation was a mandatory, assessed component of the student's course, future study should examine motivation in non-assessed and industry-based activities. Finally, generalisability of the findings is limited due to the small subject numbers and involvement of students from only a single University. The inclusion of additional cohorts and other Universities would add further value to this research area.

This research demonstrated the feasibility of a virtual student-led clinic delivering exercise science services to enhance participant self-efficacy in relation to perceived professional skills and motivation. Participation was associated with improvement across various domains related to these areas, including client communication, perceived competence and activity interest-enjoyment. With an increasing need for high-quality practicum experiences and opportunities to transfer classroom-based learning to industry applications, student-led clinics may prove a valuable addition to a range of University programs, both within and beyond the exercise science space. By providing novel learning opportunities and exposure to growing industry areas such as virtual service delivery, students are provided with an invaluable opportunity to challenge and develop their professional confidence and skills. While student practicums often involve more supervisor-driven activities, student-led programs require students to take ownership and drive client services. As observed in this study, a shift from a supervisor- to student-driven approach can enhance confidence and skills in various domains, as success of the program relies on such changes. With practicum commonly associated with feelings of tension and anxiety, academics involved in preparing students for practicum may use a student-led clinic to enhance preparedness and confidence, as well as identify areas for further development and support.

References

Black, J.D., Palombaro, K.M., & Dole, R.L. (2013). Student experiences in creating and launching a student-led physical therapy pro bono clinic: A qualitative investigation. *Physical Therapy*, *93*(5), 637-648. https://doi.org/10.2522/ptj.20110430

Blackstock, F. C., Watson, K. M., Morris, N. R., Jones, A., Wright, A., McMeeken, J. M., Rivett, D.A., O'Connor, V., Peterson, R.F., Haines, T.P., Watson, G., & Jull, G.A. (2013). Simulation can contribute a part of cardiorespiratory physiotherapy clinical education: two randomized trials. *Simulation in Healthcare*, *8*(1), 32-42. https://doi.org/10.1097/SIH.0b013e318273101a

Blum, C. A., Borglund, S., & Parcells, D. (2010). High-fidelity nursing simulation: Impact on student self-confidence and clinical competence. *International Journal of Nursing Education Scholarship*, *7*(1). https://doi.org/10.2202/1548-923X.2035

Bostick, G., Hall, M., & Miciak, M. (2014). Novel clinical learning from a student-led clinic. *The Clinical Teacher*, *11*(7), 512-515.

Buchanan, D. & Witlen, R. (2006). Balancing service and education: Ethical management of student-run clinics*. Journal of Health Care for the Poor and Underserved*,*17*, 477-485.

Bull, T. P., Dewar, A. R., Malvey, D. M., & Szalma, J. L. (2016). Considerations for the telehealth systems of tomorrow: an analysis of student perceptions of telehealth technologies. *JMIR Medical Education*, *2*(2), e11. https://doi.org/10.2196/mededu.5392

Center for Self-Determination Theory (n.d.). *Intrinsic Motivation Inventory (IMI). https://selfdeterminationtheory.org/intrinsic-motivation-inventory/*

Chester, E. C., Robinson, N. C., & Roberts, L. C. (2014). Opening clinical encounters in an adult musculoskeletal setting. *Manual Therapy*, *19*(4), 306-310. https://doi.org/10.1016/j.math.2014.03.011

Conde, J. G., De, S., Hall, R. W., Johansen, E., Meglan, D., & Peng, G. C. (2010). Telehealth innovations in health education and training. *Telemedicine and e-Health*, *16*(1), 103-106. https://doi.org/10.1089/tmj.2009.0152

Eva, K. W., & Regehr, G. (2005). Self-assessment in the health professions: a reformulation and research agenda. *Academic Medicine*, *80*(10), 46-54.

Glinkowski, W., Pawłowska, K., & Kozłowska, L. (2013). Telehealth and telenursing perception and knowledge among university students of nursing in Poland. *Telemedicine and e-Health*, *19*(7), 523-529. https://doi.org/10.1089/tmj.2012.0217

Hamilton, V., Baird, K., & Fenwick, J. (2019). Nurturing autonomy in student midwives within a student-led antenatal clinic. *Women and Birth*, *33*(5), 448-454. https://doi.org/10.1016/j.wombi.2019.12.001

Horstmanshof, L., Lingard, R. G., Coetzee, S., & Waddell, L. P. (2016). Clinical exercise physiology students learning with older adults: an innovative simulation-based education programme. *Advances in Simulation*, *1*(1), 1-10. https://doi.org/10.1186/s41077-016-0012-3

Hush, J. M., Cameron, K., & Mackey, M. (2011). Patient satisfaction with musculoskeletal physical therapy care: a systematic review. *Physical Therapy*, *91*(1), 25-36. https://doi.org/10.2522/ptj.20100061

Jackson, D. (2015). Employability skill development in work-integrated learning: Barriers and best practice. *Studies in Higher Education*, *40*(2), 350-367. https://doi.org/10.1080/03075079.2013.842221

Kirkpatrick, D., & Kirkpatrick, J. (2006). *Evaluating training programs: The four levels*. Berrett-Koehler Publishers.

Kolb, A.Y., & Kolb, D.A. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *Academy of Management Learning & Education, 4*(2), 193-212. https://doi.org/10.5465/amle.2005.17268566

Laschinger, S., Medves, J., Pulling, C., McGraw, D. R., Waytuck, B., Harrison, M. B., & Gambeta, K. (2008). Effectiveness of simulation on health profession students' knowledge, skills, confidence and satisfaction. *International Journal of Evidence-Based Healthcare*, *6*(3), 278-302. https://doi.org/10.1111/j.1744-1609.2008.00108.x

Mann, D. D., & Eland, D. C. (2005). Self-efficacy in mastery learning to apply a therapeutic psychomotor skill. *Perceptual and Motor Skills*, *100*(1), 77-84. https://doi.org/10.2466/pms.100.1.77-84

McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport*, *60*(1), 48-58. https://doi.org/10.1080/02701367.1989.10607413

Phillips, A. C., Lewis, L. K., McEvoy, M. P., Galipeau, J., Glasziou, P., Moher, D., Tilson, J.K., & Williams, M. T. (2016). Development and validation of the guideline for reporting evidence-based practice educational interventions and teaching (GREET). *BMC Medical Education*, *16*(1), 237. https://doi.org/10.1186/s12909-016-0759-1

Ramsden, P. (2003). *Learning to teach in higher education* (2nd ed.). RoutledgeFalmer.

Reeves, N. E., Waite, M. C., Tuttle, N., & Bialocerkowski, A. (2019). Simulated patient contributions to enhancing exercise physiology student clinical assessment skills. *Advances in Simulation*, *4*(1), 15-27. https://doi.org/10.1186/s41077-019-0097-6

Ryan, R. M. 1982. Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. Journal of Personality and Social Psychology, 43: 450–461.

Schutte, T., Tichelaar, J., Dekker, R. S., van Agtmael, M. A., de Vries, T. P., & Richir, M. C. (2015). Learning in student-run clinics: A systematic review. *Medical Education*, *49*(3), 249-263. https://doi.org/10.1111/medu.12625

Sealey, R., Raymond, J., Groeller, H., Rooney, K., Crabb, M., & Watt, K. (2015). Supporting placement supervision in clinical exercise physiology. *Asia-Pacific Journal of Cooperative Education*, *16*(1), 53-69.

Simpson, S.A., & Long, J.A. (2007). Medical student-run health clinics: important contributors to patient care and medical education. *Journal of General Internal Medicine, 22*(3), 352-356. https://doi.org/10.1007/s11606-006-0073-4

Vancouver, J. B., & Kendall, L. N. (2006). When self-efficacy negatively relates to motivation and performance in a learning context. *Journal of Applied Ppsychology*, *91*(5), 1146-1153. https://doi.org/10.1037/0021-9010.91.5.1146

Waters, S., Edmondston, S. J., Yates, P. J., & Gucciardi, D. F. (2016). Identification of factors influencing patient satisfaction with orthopaedic outpatient clinic consultation: A qualitative study. *Manual Therapy*, *25*, 48-55. https://doi.org/10.1016/j.math.2016.05.334

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

Wright, A., Moss, P., Dennis, D. M., Harrold, M., Levy, S., Furness, A. L., & Reubenson, A. (2018). The influence of a full-time, immersive simulation-based clinical placement on physiotherapy student confidence during the transition to clinical practice. *Advances in Simulation*, *3*(1), 3. https://doi.org/10.1186/s41077-018-0062-9

Appendix A. Adapted 'Self-confidence in Professional Skills' questionnaire: Communication focus

To what extent do you agree with the following statements about your confidence in interacting with clients at this stage of your training?

"I feel confident in my ability to..."	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Establish rapport with my client					
Explain my professional role to a client					
Conduct an effective client interview (subjective assessment)					
Use interpersonal skills appropriately with respect to eye contact					
Use interpersonal skills appropriately with respect to verbal speed, tone and volume					
Use interpersonal skills appropriately with respect to language					
Use interpersonal skills appropriately with respect to active listening, including paraphrasing, reflection of feelings					
Use interpersonal skills appropriately with respect to asking a range of open, closed and focussed questions					
Use interpersonal skills appropriately with respect to summarising/ confirming understanding					
Use interpersonal skills appropriately with respect to body language					
Interact as a professional					

Appendix B. Adapted 'Intrinsic Motivation Inventory' questionnaire: pre-program version

The following questions relate to your perceived interest/enjoyment of the activity. Please select the option that best describes your rating for each of the following statements.

	1-Not at all true	2	3	4-Somewhat true	5	6	7-Very true
This activity will be fun to do							
I will enjoy doing this activity very much							
I think this will be a boring activity							
This activity will not hold my attention at all							
I would describe this activity as very interesting							
I think this activity will be quite enjoyable							
While doing this activity, I will be thinking about how much I enjoy it							

The following questions relate to your perceived competence in doing the activity. Please select the option that best describes your rating for each of the following statements.

	1-Not at all true	2	3	4-Somewhat true	5	6	7-Very true
I think I will be pretty good at this activity							
I think I will do pretty well at this activity, compared to other students							
After working at this activity for a while, I will feel pretty competent							
I will be satisfied with my performance in this activity							
I will feel pretty skilled at this activity							
This will be an activity I can't do very well							

The following questions relate to your perceived effort/importance in relation to this activity. Please select the option that best describes your rating for each of the following statements.

	1-Not at all true	2	3	4-Somewhat true	5	6	7-Very true
I will put a lot of effort into this							
I won't try very hard to do well at this activity							
I will try very hard on this activity							
It is important for me to do well at this task							
I won't put much energy into this							

The following questions relate to your perceived pressure/tension in relation this activity. Please select the option that best describes your rating for each of the following statements.

	1-Not at all true	2	3	4-Somewhat true	5	6	7-Very true
I will not feel nervous at all while doing this							
I will feel very tense while doing this activity							
I will be very relaxed in doing this							
I will be anxious while working on this task							
I will feel pressured while doing this activity							

The following questions relate to your perceived usefulness of the activity in developing communication skills. Please select the option that best describes your rating for each of the following statements.

	1-Not at all true	2	3	4-Somewhat true	5	6	7-Very true
I think that doing the activity will be useful for developing communication skills							
I believe the activity will be of some value to me in developing communication skills							
I think this is important to do because it can assist with developing my communication skills							
I will want to do this again because it has some value in developing communication skills							
I believe doing this activity could be beneficial to me for the development of communication skills							
I think doing this activity could help me to develop my communication skills							
I think this is an important activity in terms of development of communication skills							

The following questions relate to your perceived usefulness of the activity in developing client management skills. Please select the option that best describes your rating for each of the following statements.

	1-Not at all true	2	3	4-Somewhat true	5	6	7-Very true
I think that doing the activity will be useful for developing client management skills							
I believe the activity will be of some value to me in developing client management skills							
I think this is important to do because it can assist with developing my client management skills							
I will want to do this again because it has some value in developing client management skills							
I believe doing this activity could be beneficial to me for the development of client management skills							
I think doing this activity could help me to develop my client management skills							
I think this is an important activity in terms of development of client management skills							

The following questions relate to your perceived usefulness of the activity in developing programming skills. Please select the option that best describes your rating for each of the following statements.

	1-Not at all true	2	3	4-Somewhat true	5	6	7-Very true
I think that doing the activity will be useful for developing programming skills							
I believe the activity will be of some value to me in developing programming skills							
I think this is important to do because it can assist with developing my programming skills							
I will want to do this again because it has some value in developing programming skills							
I believe doing this activity could be beneficial to me for the development of programming skills							
I think doing this activity could help me to develop my programming skills							
I think this is an important activity in terms of development of programming skills							