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Creating a supportive clinical learning environment for physiotherapy students: A feasibility study to enhance collaboration between students and educators using the 'Everything DiSC'

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Abstract

Aim: To investigate if an intervention aimed at creating a supportive clinical learning environment (through shared debriefing of behaviour styles for physiotherapy students and their educators) can i) improve the clinical skills outcomes (grades) and ii) enhance the perceived quality of clinical education experiences for students and educators compared to placements without this intervention.

Method: This quasi-experimental, non-equivalent groups, mixed methods study was conducted across two Australian universities and two public health sector settings. For the intervention group, Everything DiSC profiles and comparison reports were utilised to indicate differences and similarities in behaviour traits and this information was shared with students and clinical educators attending a 5-week placement. Written strategies were provided to enhance collaboration. For the comparison group, physiotherapy students attending usual clinical placements. Outcomes: Assessment of Physiotherapy Practice (APP) grades, Clinical Learning Environment Inventory (CLEI), Maastricht Teaching Evaluation, perspectives of clinical educators (obtained through focus groups).

Results: At the completion of the 5-week placement, no significant differences between groups were found in APP grades, CLEI, or Maastricht scores. Focus groups (n=2) with clinical educators (n=12) revealed mostly positive perspectives on the utility of DiSC in the clinical education setting.

Conclusion: Whilst sharing DiSC profiles and comparison reports between physiotherapy students and their clinical educators did not demonstrate significant benefits for students in terms of grades, positive outcomes regarding the collaboration between physiotherapy clinical educators and their students were reported by clinical educators.

I   INTRODUCTION

A major goal of the higher education sector is to create environments in which quality learning can occur for students (Biggs & Tang, 2003). For health professional students, this should consider clinical environments in addition to the university setting. To translate knowledge and skills developed in the university environment, a significant proportion of time in health professional programs is spent learning in the clinical environment external to the university setting. Physiotherapy clinical education within the clinical practice environment is an important component in ensuring competent, safe and effective clinicians (Australian Physiotherapy Council, 2017).

Physiotherapy clinical training in Australia covers key areas of clinical practice (e.g., cardiorespiratory, neurorehabilitation and musculoskeletal) across the lifespan from acute to community contexts (Australian Physiotherapy Council, 2017). Pre-registration physiotherapy clinical placements occur over a four to six week period (Queensland Physiotherapy Placements Collaborative, 2018) in a full time capacity; with all clinical placements beginning in second year and progressing to more extensive clinical training in third and fourth year (Health Workforce Australia, 2014) dependent on the program (i.e. Bachelor's, Master's or Doctoral) level and design.

On commencement of clinical placements, students often share information with their clinical educator regarding their learning styles and teaching preferences in recognition of the positive impacts these can have on their learning experience (Cox et al., 2013). However, educators would rarely share similar information about themselves with students and there are seldom reciprocal or shared understandings of how each party learns and prefers to behave. Interactions with clinical educators in the clinical learning environments have been shown to either enhance or hinder students' development (Pearcey & Elliott, 2004), with two-way communication between the student and clinical educator being a significant predictor of satisfaction and success (Brown et al., 2011). Therefore, to collaborate and effectively communicate, each needs to understand how the other best functions and how they may maximise the positive contribution of their personal attributes when interacting together with clear expectations.

Supportive clinical learning environments are essential for learning on placement (Chan, 2003) and need to be adapted where possible to the learner's needs (Arthurs, 2007). Despite educators often aligning teaching methods with their own learning preferences and styles (Hawk & Shah, 2007), students identify that the clinical learning environment is maximised when they feel included, have developed relationships with staff, are motivated and feel safe (Chan, 2001; Henderson et al., 2010; McAllister & Lincoln, 2004). The complex interactions of staff, patients, preceptors and educators all influence the clinical learning environment (Papp et al., 2003) and impact the clinical learning outcomes and student behaviours (Dunn & Burnett, 1995) whilst on placement. If there is mutual respect and understanding in the way each other functions, there is likely to be safety in the relationship creating an atmosphere of trust which encourages students to ask questions and learn from their educator. Thus, an environment which is mutually beneficial for both educators and students is created through adaptation to learning needs (Arthurs, 2007), behaviours and preferences, leading to more effective health outcomes and increased patient / client safety in the clinical education context.

It is entirely possible that some styles of behaviour may not be conducive to achieving the required competencies or success on clinical placements under usual placement constraints (Milne et al., 2019). With an established awareness of one's own dominant behaviour styles, it may be possible to use reflective practices with students and educators to facilitate change in some behaviours which are less desirable in health professional programs, and to enhance those which are predictive of successful student outcomes. An important aspect of this approach would involve raising the students' and educators' self-awareness so that they can consciously modify their unconscious behaviour tendencies to maximise student performance, student and educator collaboration and overall satisfaction with the learning experience.

Standardised behavioural preference tools such as the 'Everything DiSC' (Scullard & Baum, 2015) were developed to help individuals better understand their own and others' behaviours and motivations for success across a variety of life settings and learning environments. Through completing the workplace version of this tool and reflecting on personal drivers for human behaviour, it is believed that individuals can enhance their communication, rapport and relationships, whilst also improving one's ability to react to situations (Satterly & Brimer, 1977), all of which are critical in learning and developing competency for physiotherapy students.

II   AIM AND PURPOSE

The aim of this feasibility study was to investigate if sharing results of behaviour styles for both physiotherapy students and their educators can i) improve the clinical proficiency outcomes (grades on the Assessment of Physiotherapy Practice (APP)) for students and ii) enhance the perceived quality of clinical education experiences for students and educators compared to placements without this intervention.
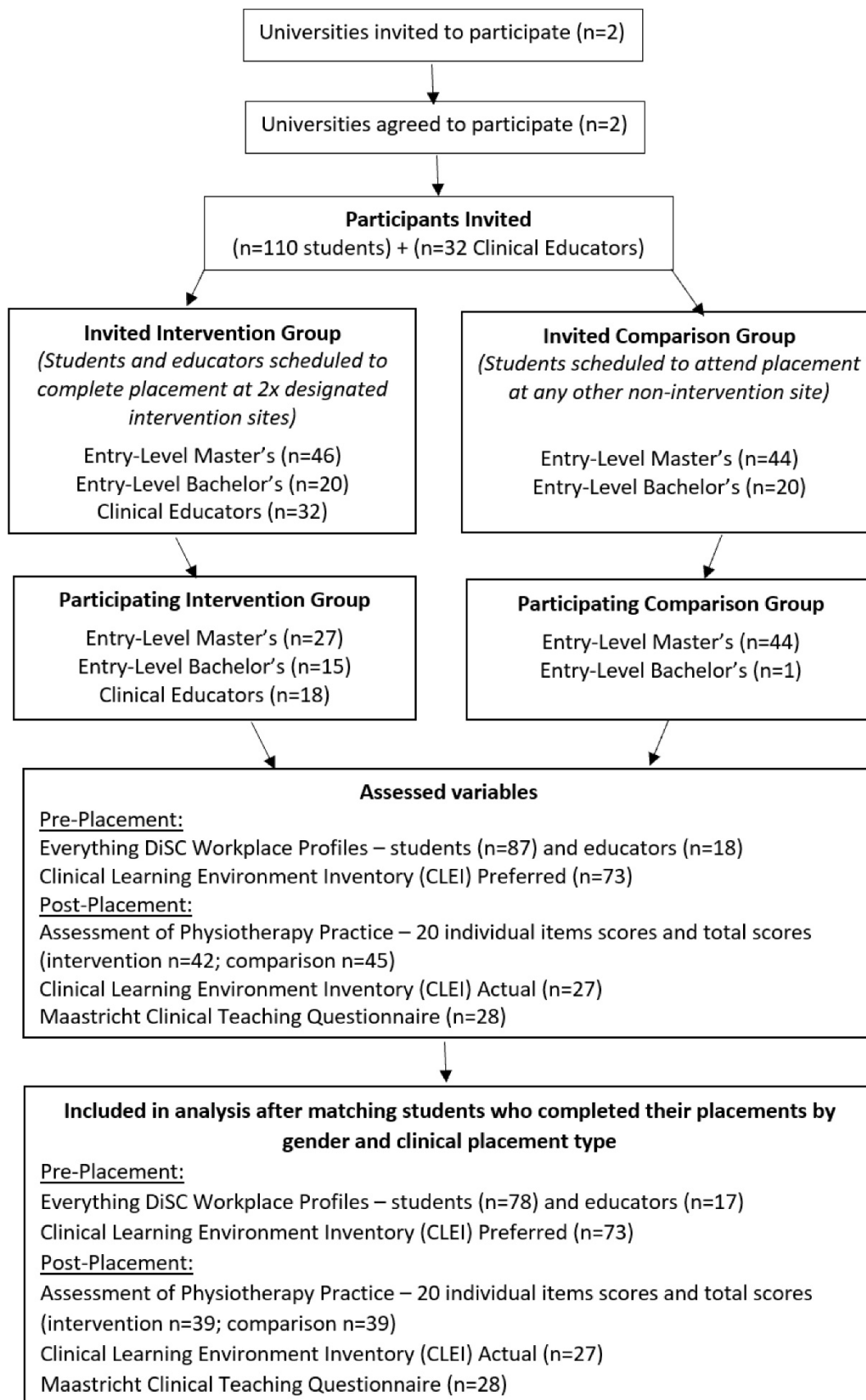
III   METHODS

A   *Setting and study design*

This quasi-experimental, non-equivalent groups, mixed methods study was conducted across two Australian universities and two public health sector settings. Ethical approval was obtained by the Bond University Human Research Ethics Committee (Protocol Numbers 16127 and NM03225) and by the Metro South Health Human Research Ethics Committee (HREC/17/QPAH/803) with site specific approval to conduct the intervention arm of the study across two physiotherapy departments within Queensland Health.

B   *Recruitment and study participants*

Australian physiotherapy students from two Australian Universities (one entry-level Master's program and one Bachelor's level program) were invited to participate in the study. Students were allocated by their University clinical education coordinators to placements across various health facility settings in 2018. All students undertaking placements in the designated intervention settings were then invited (via email or an information setting) to participate in the intervention arm of the study. If after reading the participant information sheet the physiotherapy student and their clinical educator both provided informed consent to participate in the study, students were included in the *intervention group*. Students in the *comparison group* were recruited from the same two universities and included students who were also undertaking placements across 2018 in non-intervention sites, or students who had participated in a previous study (by the same research team) exploring relationships between the Everything DiSC and clinical education outcomes (Milne et al., 2019). Figure 1 provides an outline of the flow of participants through the study.

Figure 1
**Flow of participants through the study**

Universities invited to participate (n=2)

↓

Universities agreed to participate (n=2)

↓

Participants Invited
(n=110 students) + (n=32 Clinical Educators)

Invited Intervention Group
(Students and educators scheduled to complete placement at 2x designated intervention sites)

Entry-Level Master's (n=46)
Entry-Level Bachelor's (n=20)
Clinical Educators (n=32)

Invited Comparison Group
(Students scheduled to attend placement at any other non-intervention site)

Entry-Level Master's (n=44)
Entry-Level Bachelor's (n=20)

Participating Intervention Group

Entry-Level Master's (n=27)
Entry-Level Bachelor's (n=15)
Clinical Educators (n=18)

Participating Comparison Group

Entry-Level Master's (n=44)
Entry-Level Bachelor's (n=1)

Assessed variables
Pre-Placement:
Everything DiSC Workplace Profiles – students (n=87) and educators (n=18)
Clinical Learning Environment Inventory (CLEI) Preferred (n=73)
Post-Placement:
Assessment of Physiotherapy Practice – 20 individual items scores and total scores
(intervention n=42; comparison n=45)
Clinical Learning Environment Inventory (CLEI) Actual (n=27)
Maastricht Clinical Teaching Questionnaire (n=28)

Included in analysis after matching students who completed their placements by gender and clinical placement type
Pre-Placement:
Everything DiSC Workplace Profiles – students (n=78) and educators (n=17)
Clinical Learning Environment Inventory (CLEI) Preferred (n=73)
Post-Placement:
Assessment of Physiotherapy Practice – 20 individual items scores and total scores
(intervention n=39; comparison n=39)
Clinical Learning Environment Inventory (CLEI) Actual (n=27)
Maastricht Clinical Teaching Questionnaire (n=28)

C *Predictors, outcome measures and covariates*

1 *Everything DiSC - Workplace (Predictor)*

The Everything DiSC is a valid and reliable assessment tool for measuring an individual's preferred behaviour inclinations (Scullard & Baum, 2015) and takes approximately 15 – 20 minutes to complete on an online platform. The Everything DiSC uses eight DiSC scales (angle points within a circumplex) to quantify individuals across several behaviour tendencies; Dominance/ Influence (Di), Influence (i), Influence/ Steadiness (iS), Steadiness (S), Steadiness/ Conscientiousness (SC), Conscientiousness (C), Conscientiousness/ Dominance (CD) and Dominance (D). Good-to-excellent internal consistency is reported for each of the individual scales in the Everything DiSC (all ≥ 0.83 using Cronbach's Alpha) and the test-retest reliability over a two-week period was reported to be above 0.85 for all Everything DiSC scales. The Everything DiSC scales are used to define four main DiSC styles (Dominance, Influence, Steadiness and Conscientiousness) across four quarters of the circle and twelve individual styles each occupying 30 degrees of the circle. The twelve individual styles and their corresponding priorities impacting behaviour are: 1) CD – accuracy, challenge and results; 2) D – challenge, results and action; 3) Di – results, action and enthusiasm; 4) iD – results, action and enthusiasm; 5) i – action, enthusiasm and collaboration; 6) iS – enthusiasm, collaboration and support; 7) Si – enthusiasm, collaboration and support; 8) S – collaboration, support and stability; 9) SC – support, stability and accuracy; 10) CS – support, stability and accuracy; 11) C – stability, accuracy and challenge; and 12) CD – accuracy, challenge and results (see Figure 2).

Figure 2
Everything DiSC Workplace Profiles
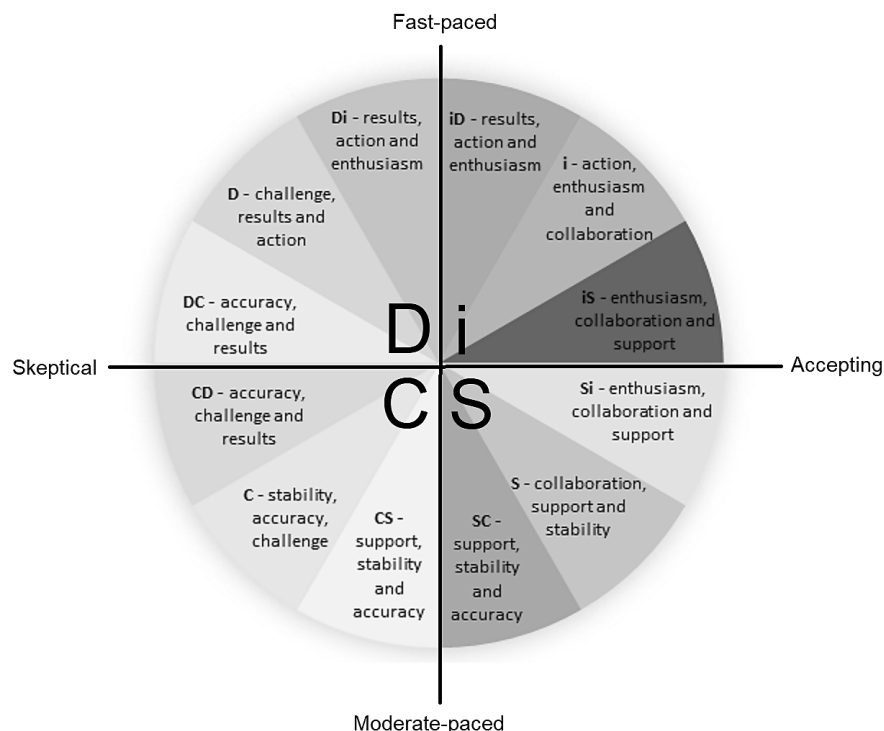
Previous published research suggests that the median angle change for repeated measures of the Everything DiSC using the same population sample is approximately 12 degrees, with participants who had stronger inclinations towards their given DiSC style (i.e., the dot on the outer half of the circle) showing greater consistency (Scullard & Baum, 2015). Two main dimensions exist within the Everything DiSC. The first dimension places individuals on a continuum of being fast-paced through to moderate-paced and the second dimension places individuals on a

skeptical through to accepting continuum (Scullard & Baum, 2015). Across these two-dimensional scales, the Dominance / Influence styles (Di or iD) are positioned at the fast-paced end of the first continuum. People categorised within these are often described as 'dynamic' individuals. The Influence style (i) is positioned at the fast-paced end of the first continuum and to the accepting end of the second continuum. Those who exhibit this style are often referred to as 'lively and outgoing'. Those displaying the Influence / Steadiness (iS or Si) styles are positioned on the accepting end of the first continuum and often referred to as 'cheerful'. Individuals with the Steadiness (S) style are positioned at the moderate-paced end of the first continuum and the accepting end of the second continuum and are often described as 'gentle'. Those with the Steadiness / Conscientiousness (SC or CS) styles are situated at the moderate-paced end of the first continuum and commonly referred to as 'softly spoken'. Individuals with the Conscientiousness (C) style situated at the moderate-paced end of the first continuum and the skeptical end of the second continuum, are often described as 'analytical'. Individuals with the Conscientiousness / Dominance (CD or DC) styles are positioned at the skeptical end of the second continuum and their behaviour is often described as 'challenging'. Those with a Dominance (D) style are positioned at the fast-paced end of the first continuum and the skeptical end of the second continuum and often referred to as 'strong-willed' (Scullard & Baum, 2015).

Whilst the DiSC is a tool used to describe styles of preferred behaviour, it has components of personality that are consistent with the introversion / extroversion construct of a reported model of psychometric theory; the five-factor model (FFM) of personality (McCrae & Costa, 1987). Previously published research suggests that the extroversion factor of the FFM runs diagonally through the DiSC, through the Influence quadrant and the introversion line intersects the Conscientiousness quadrant.

2 Everything DiSC - Workplace Administration

After all students and clinical educators had completed their DiSC profiles online, they were debriefed either individually or in separate groups. All students were provided information about their individual DiSC style and information on other DiSC styles over a 1-hour debriefing session (either individual or in a group). Additionally, the information was used to develop paired DiSC profile comparison reports between the student and the clinical educator. The comparison reports were provided to both the student and the clinical educator and plotted both the student and the educator on the same scales based on their individual traits identified through the Everything DiSC assessment. The traits were associated with their personal DiSC style and included polarized attributes such as; i) softly spoken – forceful, ii) daring – careful, iii) patient – driven, iv) skeptical – accepting, v) outgoing – private, vi) tactful – frank, vii) accommodating – strong-willed, viii) lively – reserved, ix) calm – energetic. In the comparison report, information was provided to both the student and clinical educator and included strategies to foster effective collaboration with each other in a workplace environment during the clinical education placement.

Table 1
Examples of strategies in comparison report

Strategies for Student Exhibiting a D Style	
Potential roadblocks when working with Educator X	Because you tend to be demanding at times, Educator X may feel it's difficult to be heard. Your forceful approach may cause Educator X to withdraw before a disagreement has been resolved.
Tips for working with Educator X	Avoid dominating the discussion. Encourage Educator X to share their opinions with you more often. Refrain from pushing Educator X to accept your ideas.
Potential benefits of you (student) and Educator X working together	Your more forceful approach may help expose issues or problems Educator X's modest approach probably prevents disagreements from getting too intense.

Strategies such as those listed in Table 1 were provided in the comparison report for the top six polarizing traits between the student and clinical educator.

3   *Assessment of Physiotherapy Practice (Outcome)*

Clinical performance during physiotherapy clinical placements was assessed by clinical educators using the Assessment of Physiotherapy Practice (APP); a valid (Dalton et al., 2011) and reliable (Dalton et al., 2012) tool for measuring a students' clinical performance during a five-week physiotherapy placement. The APP assesses observable behaviours exhibited by students across 20 items covering seven domains of clinical performance: 1) Professional behaviour; 2) Communication; 3) Assessment; 4) Analysis and Planning; 5) Intervention; 6) Evidence-based Practice and; 7) Risk Management. Each discrete item is scored 0 – 4, with 0 = infrequently / rarely demonstrating performance indicators, through to 4 = demonstrating most performance indicators to an excellent standard. The maximum total score that a student can achieve on the APP is 80 and for the purpose of analysis in this study, all APP scores were converted to a percentage score. The APP is scored by clinical educators at the mid-way point of placement and at that time students are offered formative feedback with suggestions for improving outcomes before being scored again at the end of each placement (summative assessment). Prior to completing their clinical placements, all students had successfully completed the associated pre-clinical coursework. All clinical educators assessing students using the APP were registered physiotherapists in Australia and had completed training on the standardised use of the APP or otherwise were supervised by a senior clinical educator with expertise using the APP. The clinical placements undertaken in this study, included the physiotherapy fields of cardiorespiratory, orthopaedics, musculoskeletal outpatients, neurological rehabilitation, paediatrics, and other mixed placements. If a student completed two placements in the intervention or comparison settings, they were treated as two separate student placements for the purpose of analysis. For this study, the APP scores were collected independently by the academic staff at the universities before being shared with the research team and only final placement scores were utilised for analysis in this study.

4   *Clinical Learning Environment Inventory – Preferred and Actual Forms*

To assess the student's expectations regarding the clinical learning environment, the Clinical Learning Environment Inventory (CLEI) preferred version was completed prior to students undertaking their clinical placements. The CLEI is a valid and reliable assessment of students' self-reported preferred learning environment in clinical education contexts (Chan, 2003). The CLEI components of individualization, innovation, involvement, personalization, task orientation and satisfaction were recorded to determine the expectations of each student concerning their clinical education experience. The CLEI responses were used to determine if baseline differences existed between the intervention and comparison groups. If baseline differences existed between the groups, the CLEI components were planned to be accounted for statistically as a possible confounder to the intervention effect. In addition to the CLEI preferred tool, the students were asked to complete the CLEI actual, which was used as a retrospective assessment of the clinical learning environment where students had undertaken their placement in either the intervention setting or a comparison setting. The CLEI actual scores were used to explore and contrast students' overall satisfaction with the clinical education environment during the clinical placement in both the intervention or comparison placements.

5   *Maastricht Clinical Teaching Questionnaire*

The Maastricht Clinical Teaching Questionnaire (MCTQ) is a valid and reliable tool based on the theoretical constructs of cognitive apprenticeship and has been used in health-based clinical education environments to elicit students' evaluations of individual clinical educators' performance in the workplace (Stalmeijer et al., 2010). The content validity of the MCTQ was established through stakeholder focus groups (i.e., clinical educators, academics and senior students) and subsequent to undertaking confirmatory factor analysis the final MCTQ resulted in five factors of clinical teaching (modelling, coaching, articulation, exploration and learning environment) in addition to an overall judgement score. Each factor was cross validated and achieved correlations of r > 0.72 with the overall judgement score (Stalmeijer et al., 2008). Students were asked to provide answers to twenty-four individual MCTQ items using a Likert

scale (1 = fully disagree, 5 = fully agree) and they were also asked to make an overall judgement of their clinical educator's performance (a mark out of 10 where below 6 was considered insufficient and identified student dissatisfaction with their clinical educator's performance). For the purpose of analysis in this study, the overall judgement score and total combined score were utilised as measures of student satisfaction regarding their clinical educators' performance.

6 Focus Groups with Clinical Educators

Qualitative description (Sandelowski, 2000) was employed to explore the perceptions and experiences of clinical educators participating in the intervention arm of the study. At the completion of the intervention year, focus groups were run at each of the intervention settings. Focus groups were facilitated by a member of the research team (DR) who had not previously had any involvement with the clinical educators or students during the placement year. A semi-structured question guide (Table 2) was developed by the research team with the aim of exposing the benefits and or pitfalls of using the Everything DiSC from the clinical educators' perspectives. The question guide was also used during the focus groups to explore DiSC utility, specifically how knowledge of DiSC profiles did or did not influence placement outcomes, quality and communication. There was nil prompting of participants beyond the questions posed, other than to refocus participants to topic or clarify understanding of statements.

Table 2
Semi-structured focus group question guide

Focus Group Semi-Structured Questions
Overall, what was your experience with using the DiSC?
Can you provide details of any difficulties (if any) accessing / processing the results of your own DiSC profile?
Did you feel / sense / have any concerns with your DiSC profile being shared with your student? (If so, please state what these were and why?)
What was beneficial about having knowledge of your (Clinical Educator) DiSC profile?
What was beneficial about having knowledge of your students' DiSC profile?
What concerns (if any) do you have about using the DiSC profiles and comparison reports in the clinical education context?
Do you feel that the outcomes would have been any different if the student did not have access to their own DiSC profile? (If so, in what way?)
Do you feel that the outcomes would have been any different if you (the Clinical Educator) did not have access to your DiSC profile?
Would you recommend using this method to improve the quality of communication/collaboration during clinical education placements for future students? (If yes, why? If no, why not?)

D Procedure and Intervention

After students consented to participating in either the intervention group or the comparison group, the Everything DiSC assessments were undertaken by a member of the research team licensed to administer the Everything DiSC profiles. For students in the intervention group, an email was sent to their clinical educator, inviting them to participate in the intervention. Once consent was received, the educators in the intervention settings also undertook the Everything DiSC assessment and the combined details from the student and the clinical educator were used to develop an Everything DiSC comparison report (detailed above). All students and clinical educators in the intervention group were provided with a detailed report regarding their Everything DiSC style and preferred behaviours. This was conducted during their debriefing prior to or at commencement of placement. Prior to the placement beginning all students were asked to complete the CLEI preferred as an indication of their expectations regarding the clinical education environment. All students in the comparison group were provided information about their DiSC style (n=26 prior to their comparison placement) and (n=13 after their comparison placement), however their clinical educators were not involved in the study. Participants in the intervention group undertook a full-time 5-week placement in either of the intervention settings during 2018. During the orientation week of the intervention placements, the clinical educators and students

were asked to discuss their DiSC profiles with each other and to consider the strategies documented in the Everything DiSC comparison reports. The clinical educators and students were encouraged to discuss the strategies again at mid placement. Students in the comparison group were not encouraged to discuss their DiSC profiles with their educator in any way. Data for the comparison group was obtained from a matched (gender and placement type) student undertaking a 5-week clinical placement in a non-intervention setting. The APP assessments for students in the intervention and comparison groups were undertaken by the clinical educators (as per usual university processes) and at the completion of the clinical placement year (2018), all APP grades for students in the intervention and comparison groups were accessed via independent academic staff from the participating universities. At the completion of the clinical placements, students in both the intervention and comparison groups were invited to complete the CLEI actual and MCTQ, to provide feedback about the clinical education environment and clinical educator performance, respectively. To gain feedback regarding the utility of the DiSC in clinical education from the perspective of the intervention group clinical educators', focus groups were run at each intervention setting at the end of the intervention year by the research team (December 2018).

E   *Analysis of data*

All statistical analyses were conducted using the Statistical Package for the Social Sciences (Version 25) (IBM_Corp., 2017). Means, standard deviations, median scores, ranges, and frequencies of response rates were calculated using descriptive statistics to characterise the study populations. Frequency of Global DiSC styles were calculated and represented graphically. Frequencies of specific DiSC styles were also calculated. Assumptions for parametric statistics were explored using normality of data measures including frequency distributions and equality of variances. To explore possible confounders to the primary analyses, independent samples t-tests (using Levene's Test for Equality of Variances) were used to determine if differences existed in clinical education environment expectations using CLEI preferred scores. To determine if 'time of debriefing' (prior to placement versus after placement) for students in the comparison group was going to be a confounder in our primary analysis, independent samples t-tests with their APP scores were undertaken. To address our main aims; to explore the differences in clinical placement outcomes, APP item and total scores for students in the intervention versus comparison groups were analysed using Independent Samples T-tests and Mann Whitney U tests, depending on the nature of the data and if assumptions of normality and equal distributions were met. To explore differences in the satisfaction of the clinical education environment (CLEI – actual) and clinical educator performance (MCTQ), students were invited at the end of each placement to complete the CLEI – actual and the MCTQ and independent samples t-tests were applied. Significance level for all analyses was set at $p = < .05$ unless otherwise stated.

All focus group responses were recorded, transcribed verbatim, de-identified and then analysed using qualitative content analysis (Morgan, 1993). Specifically, responses to each of the questions were collated and inductively coded to identify patterns and commonalities within and across focus groups by two physiotherapy researchers (both with experience of clinical education in physiotherapy). Codes were collapsed into categories to reflect the interpretation of the response to address the research aims. Codes and categories were then checked and confirmed with a third researcher (a dietitian with experience in clinical education in dietetics). Efforts were made to ensure divergent views were captured and presented within the analysis by checking back through the transcripts and selecting exemplar quotes to illustrate each of the categories, with selection reflecting both the majority and divergent viewpoints.

1   *Covariates*

Gender, placement type and placement timing (i.e., placement progression point in program) were identified prior to the study as possible covariates. To control the impact of these variables on the outcomes being measured, students undertaking clinical placements in the intervention settings were matched to students in the comparison group. This was done by matching gender and placement type in addition to placement timing by exact placement block +/- one placement
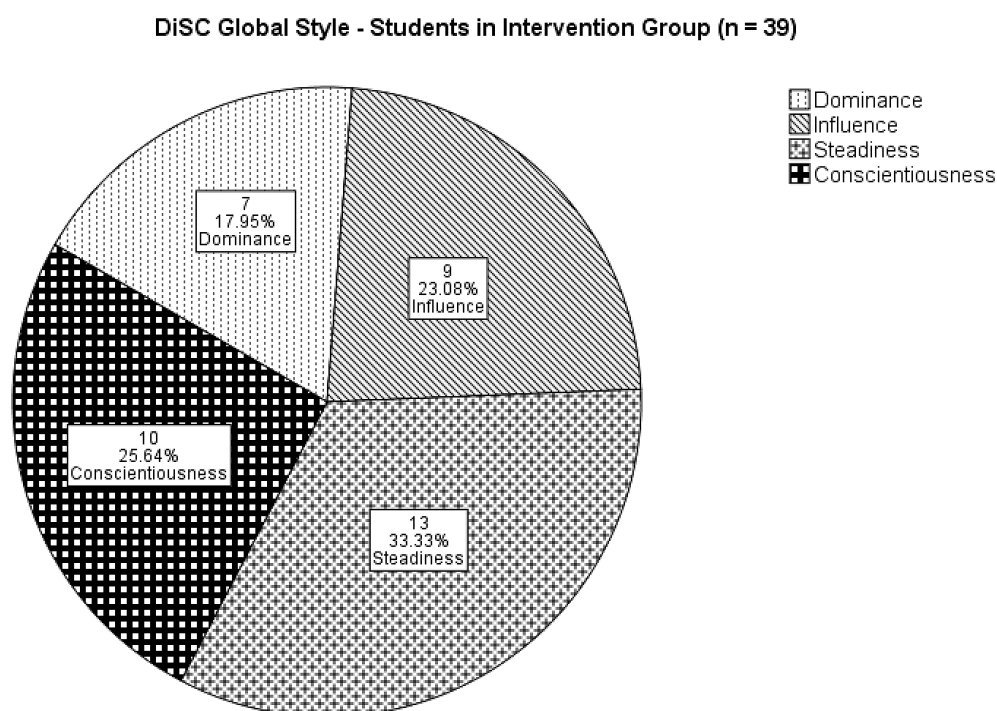
block before or after the placement was undertaken by the student in the intervention group. This was undertaken prior to analysis by placing students in the comparison group into a random order list in excel, showing only their gender, placement type and time of placement, and matching the first compatible student to the student in the intervention group. The CLEI – preferred (students' expectations of their clinical education environment) was also identified as a possible confounder.
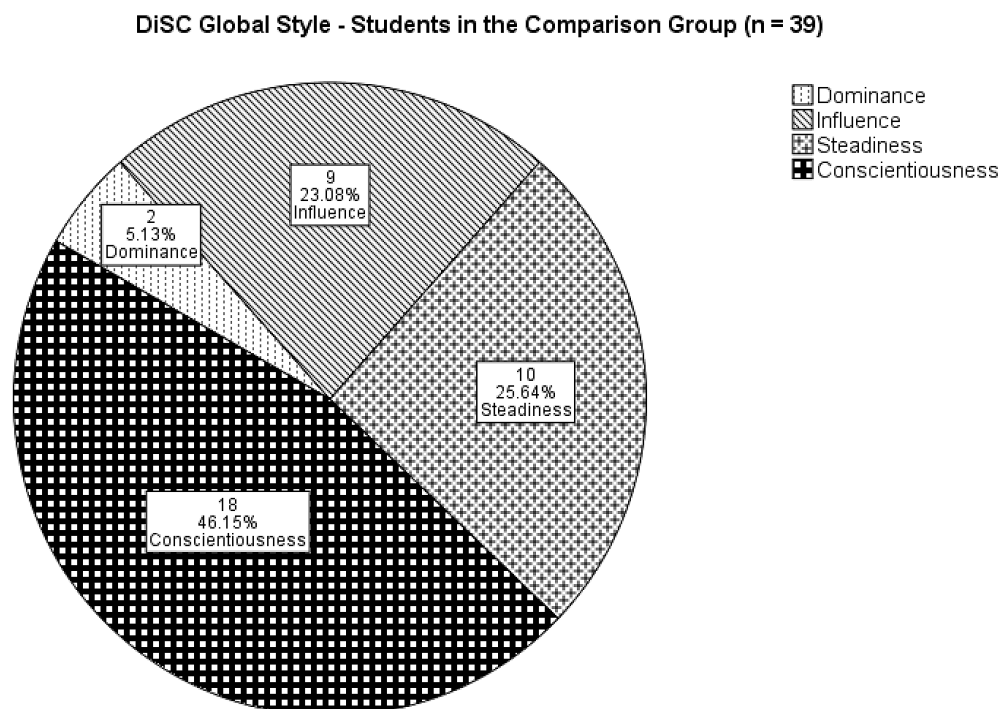
IV RESULTS

A *Participants*

A total of 87 students from two Australian physiotherapy entry-level programs and 18 clinical educators (F = 16, M = 2) from two public health hospital settings initially participated in this study. Three students who participated in the intervention study did not complete their clinical placements due to major life events and consequently data from these students was not analysed. After matching the remaining students in the intervention study to form the comparison group, 78 students remained; 39 in the intervention group (F = 19, M = 20) and 39 in the comparison group (F = 19, M = 20). One female educator was also removed from analysis as the educator was involved in the intervention group with students who did not complete the placement, leaving 17 clinical educators for analysis. Figure 1 outlines the flow of participants through the study. Figures 3 and 4 provide graphical representations of the global DiSC style frequencies in the intervention and comparison groups.

Figure 3
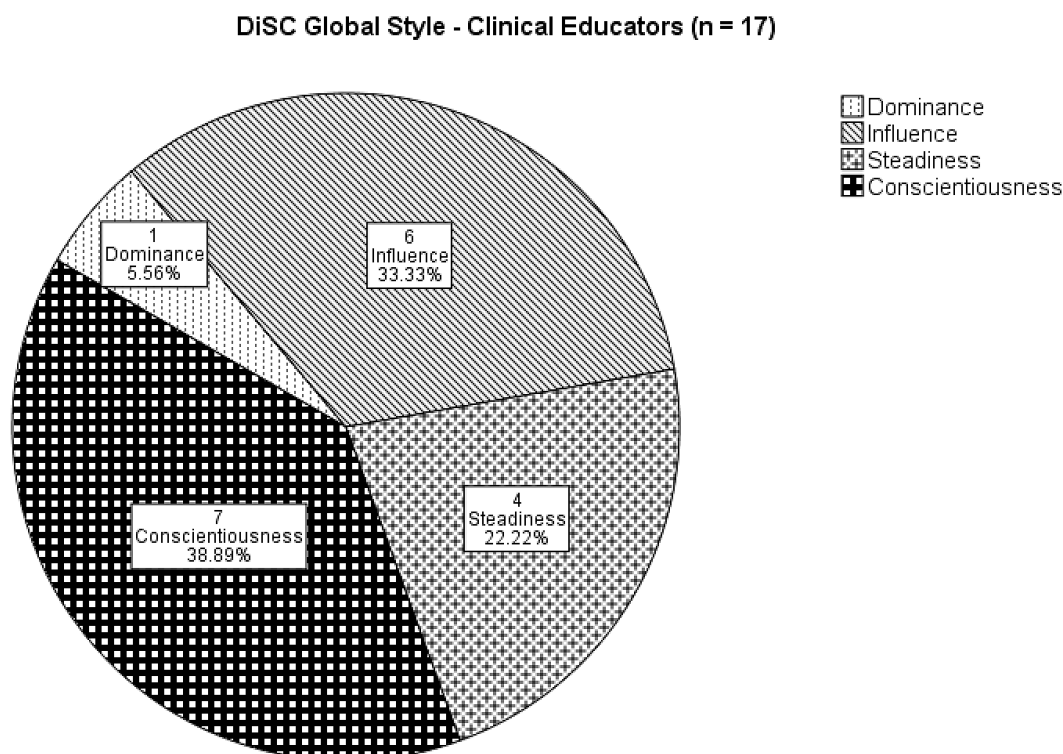**Global DiSC styles of students in the intervention group**

DiSC Global Style - Students in Intervention Group (n = 39)

Figure 4
Global DiSC styles of students in the comparison group

DiSC Global Style - Students in the Comparison Group (n = 39)

Legend:
- Dominance
- Influence
- Steadiness
- Conscientiousness

Pie chart segments:
- 2 / 5.13% / Dominance
- 9 / 23.08% / Influence
- 10 / 25.64% / Steadiness
- 18 / 46.15% / Conscientiousness

When student grades were explored based on specific DiSC styles, the two higher achieving specific DiSC styles for APP grades were the D and Si styles and these made up 2.56% (n=1) and 5.13% (n=2) of the student sample respectively in the intervention group. Whereas the comparison group had no student with a D style and only 2.56% (n=1) of students with an Si style. Students with the lowest APP grades were those with the i and CS specific DiSC styles, and in the intervention group this accounted for 12.82% (n=5) and 15.38% (n=6) respectively. Additionally, for students in the comparison group, the i style accounted for 7.69% (n=3) and the CS style accounted for 17.95% (n=7) of the group. Collectively, the intervention group presented with; 7.69% of students with specific DiSC styles (D and Si) that have been previously reported to be in the highest quartile of APP grades (Milne et al., 2019) and 28.2% of students with specific DiSC styles (i and CS) known to have a higher risk of failure in clinical placement (Milne et al., 2019). Collectively, the comparison group had 2.5% of students with DiSC specific styles in the higher achieving APP quartile and 25.64% with DiSC styles known to have a higher risk of failure in clinical placement.

The clinical educator experience ranged from 1 to 16 years with an average of 5.56 years of experience as a clinical educator. Figure 5 provides a graphical representation of the global DiSC styles of the clinical educators in the Intervention group. During the intervention arm of the study, five students did not pass their clinical placements. The DiSC profiles of these students were i (n=2), CS (n=2), SC (n=1) and the DiSC profiles of the clinical educators matched with these students included C style (n = 4 fails) and CS style (n = 1 fail).

Figure 5
Global DiSC style of clinical educators

DiSC Global Style - Clinical Educators (n = 17)

Legend:
- Dominance
- Influence
- Steadiness
- Conscientiousness

1 Dominance 5.56%
6 Influence 33.33%
4 Steadiness 22.22%
7 Conscientiousness 38.89%

Seventy one of the 78 possible students completed the CLEI – preferred. Mann Whitney U tests revealed no significant differences in the CLEI preferred scores, suggesting that prior to the intervention and equivalent comparison group placement, students shared similar expectations regarding their clinical education environment (see Table 3) confirming the CLEI - preferred would not need to be considered as a possible confounder in further analyses.

Table 3
Difference in CLEI Preferred scores between students in the intervention group compared to the comparison group.

CLEI Scores	Combined (n= 71) Mean (±SD)	Intervention (n = 39) Mean (±SD)	Comparison (n = 39) Mean (±SD)	Difference between Intervention and Comparison groups[a]
CLEI Preferred - Personalisation	31.72 (2.51)	31.68 (2.90)	31.76 (2.13)	.803
CLEI Preferred - Student Involvement	26.63 (2.76)	26.91 (2.77)	26.38 (2.76)	.356
CLEI Preferred - Task Orientation	31.35 (2.50)	31.41 (2.61)	31.30 (2.43)	.684
CLEI Preferred - Innovation	26.97 (3.27)	26.56 (3.48)	27.35 (3.06)	.394
CLEI Preferred - Individualisation	23.90 (4.04)	23.76 (4.30)	24.03 (3.85)	.669
CLEI Preferred - Student SATISFACTION	32.73 (2.40)	32.62 (2.73)	32.84 (2.09)	.977

[a]*P values derived from Mann Whitney U - Asymp. Sig. (2-tailed)*

Further, independent samples t-tests of students in the comparison group revealed no significant difference in APP grades for students who were debriefed prior to placement (n=26; APP Total % Score = 72.16) compared to those who were debriefed after their comparison placement (n=13; APP Total % Score = 79.25) (t- -1.297, (DF=37), p=0.203). For this reason,

students in the comparison group were aggregated for all further analyses and this was not considered a confounder for analysis when addressing our main aims.

B *Quantitative Outcomes*

No significant differences in APP Total Scores and Percentage Scores were revealed between students in the intervention and comparison groups. There were also no significant differences in mean ranks for non-parametric APP (individual item scores) for students in the intervention group compared to those in the comparison group. Table 4 provides the mean results for APP scores and results for analysis of difference for individual and total scores.

Table 4
APP scores and difference between intervention and comparison groups

APP Scores	Combined (n= 78)		Intervention (n = 39)		Comparison (n = 39)		Difference between Intervention and Comparison groups[a]
	Mean	±SD	Mean	±SD	Mean	±SD	p-value
Professional Behaviour							
1.Demonstrates an understanding of client rights and consent	3.55	0.658	3.56	0.718	3.54	0.600	0.555
2.Demonstrates commitment to learning	3.31	0.887	3.21	1.031	3.41	0.715	0.600
3.Demonstrates ethical, legal & culturally responsive practice	3.51	0.716	3.54	0.790	3.49	0.644	0.404
4.Demonstrates collaborative practice	3.05	0.966	2.97	1.063	3.13	0.864	0.668
Communication							
5.Communicates effectively and appropriately - Verbal/Non-verbal	2.97	0.925	2.92	1.010	3.03	0.843	0.760
6.Demonstrates clear and accurate documentation	3.01	0.875	3.03	1.013	3.00	0.725	0.650
Assessment							
7.Conducts an appropriate client-centred interview	3.05	0.851	3.10	0.912	3.00	0.795	0.423
8.Selects and measures relevant health indicators and outcomes	2.74	0.797	2.72	0.857	2.77	0.742	0.934
9.Performs appropriate physical assessment procedures	2.91	0.825	2.92	0.870	2.90	0.788	0.823
Analysis & Planning							
10.Appropriately interprets assessment findings	2.78	1.002	2.82	1.073	2.74	0.938	0.628
11.Identifies and prioritises client's problems	2.82	0.922	2.82	1.023	2.82	0.823	0.850
12.Sets realistic short- and long-term client-centred goals	2.69	0.872	2.67	0.955	2.72	0.793	0.882
13.Selects appropriate intervention in collaboration with the client	2.78	.863	2.74	.938	2.82	.790	0.834
Intervention							
14.Performs interventions appropriately	3.00	.912	2.95	.972	3.05	.857	0.726
15.Is an effective educator	2.87	.903	2.85	1.014	2.90	.788	0.983
16.Monitors the effect of intervention	2.86	.893	2.90	1.071	2.82	.683	0.469
17.Progresses intervention appropriately	2.87	.903	2.77	.959	2.97	.843	0.413

APP Scores	Combined (n= 78)		Intervention (n = 39)		Comparison (n = 39)		Difference between Intervention and Comparison groups[a]
	Mean	±SD	Mean	±SD	Mean	±SD	p-value
18.Undertakes discharge planning	2.74	.874	2.72	.972	2.77	.777	0.949
Evidence-based Practice							
19.Applies evidence-based practice in client-centred care	2.90	1.001	2.82	1.048	2.97	.959	0.551
Risk Management							
20.Identifies adverse events/near misses and minimises risk associated with assessment and interventions	3.05	.952	3.05	1.025	3.05	.887	0.816
Total APP out of 80	**59.45**	**15.21**	**59.08**	**17.15**	**59.82**	**13.21**	**0.831**
Total APP Percentage (%)	**74.19**	**18.89**	**73.85**	**21.43**	**74.53**	**16.23**	**0.875**

Significance value set at p = < 0.05. Independent samples t-tests used to assess differences with parametric data (Total APP scores). [a]Mann Whitney U tests used to assess differences between groups for ordinal data (APP Item scores).

Just over one third (n = 27) of student participants completed the CLEI Actual scores, with reasons for not completing it including "too busy" and "have already completed the clinical placement questionnaire from the facility". No significant differences were found between the intervention group and the comparison group regarding their satisfaction with their clinical learning environment (see Table 5).

Table 5
Differences in CLEI Actual scores between students in the intervention group compared to the comparison group

CLEI Actual Scores	Combined (n= 27)		Intervention (n = 13)		Comparison (n = 14)		Difference between Intervention and Comparison groups (p-value)
	Mean (±SD)		Mean (+-SD)		Mean (+-SD)		
CLEI Actual - Personalisation	27.67	5.65	26.54	6.68	28.71	4.50	0.327
CLEI Actual - Student Involvement	26.30	4.37	26.23	5.15	26.36	3.69	0.942
CLEI Actual - Task Orientation	28.96	3.40	28.54	3.18	29.36	3.67	0.543
CLEI Actual - Innovation	24.15	6.32	24.23	6.22	24.07	6.65	0.949
CLEI Actual - Individualisation	22.19	4.97	20.62	5.41	23.64	4.20	0.115
CLEI Actual - Student SATISFACTION	27.96	5.54	26.92	6.38	28.93	4.67	0.358

Significance level set at p = < 0.05. Independent Samples T – tests

Thirty-five percent (n = 27) of student participants in the study completed the MCTQ. The MCTQ total score and global rating was utilised to explore student satisfaction with the clinical educator performance. There were no significant differences in the student reported clinical educator performance between the intervention group and the comparison group (see Table 6).

Table 6
Differences in MCTQ (student-rated clinical educator performance) scores between students in the intervention group compared to the comparison group

MCTQ Scores	Combined (n= 27)		Intervention (n = 13)		Comparison (n = 14)		Difference between Intervention and Comparison groups (p-value)
	Mean	±SD	Mean	±SD	Mean	±SD	
Maastricht Global Rating /10	7.81	2.001	7.62	2.364	8.00	1.664	0.627
Maastricht Total Score	98.07	19.601	97.00	21.323	99.00	18.689	0.793

MCTQ - Maastricht Clinical Teaching Questionnaire.
Significance value set at p = <0.05. Independent Samples T – tests

C   *Qualitative Outcomes*

Eight clinical educators participated in the focus groups and four clinical educators who were unable to attend provided written feedback in response to the provided focus group questions. Overall, the focus groups revealed that eleven (92%) of the 12 clinical educators who participated in the focus groups (or provided written responses) indicated that their experience with using the DiSC profiles and associated comparison reports during the clinical placement was positive. This was supported by general statements such as:

> I loved having the tool (DiSC profile and comparison reports) …and I think honestly, it is an outstanding tool regarding the way you interact. I spend a lot of time looking at personal interaction and those sort of things and reflection on that, so I found it an awesome tool to add to what I have previously used. LH4

> I think it is a good problem-solving tool. I really only see it as a benefit as it gives you more information if you have a problem. I think that is a good thing. Whether or not you always use it, more information is always a good thing. PH3

> "If we could have it for every student that would be fantastic". LH1

One educator (8%) did not feel that using the DiSC contributed positively to the clinical education experience, providing responses such as:

> I already have strategies for working with people with a range of preferences, abilities, personality etc. I react in situation within these rather than referring to DiSC strategies. Student personalities, results didn't help with broader issues around placement preferences, etc. LH7

Table 7 provides the qualitative categorisation and descriptions with both the majority and divergent viewpoints of Clinical Educators regarding benefits to using the DiSC in physiotherapy clinical education contexts. Table 8 provides the qualitative categorisation and descriptions identified in the focus group regarding the concerns with using the DiSC in physiotherapy clinical education contexts.

Table 7
Qualitative categorisation and description of open-ended responses regarding benefits of using the Everything DiSC in clinical education

Category	Supporting Quotes
Reciprocal Sharing of Information	
The DiSC profile and comparison report were viewed as a toolbox of specific strategies to enhance the interactions between educator and student, which served to equalize the relationship. Two-way communication was more effective, with improved awareness of positive communication strategies as a new tool to reflect on own communication. The strategies were valued as being proactive, rather than reactive, as a result of being able to identify potential issues and implement strategies earlier in the placement. As the clinical educator adapted behaviour to work best with the student, educators modelled flexibility and this enhanced student safety in trialling new ways of functioning.	*"Be[ing] really open about everything, in my mind will only lead to better outcomes… I would much rather them [the students] be aware of my [the educator] style, so that they can get the most out of everything [placement], and they can get the most out of me [the educator]."* LH2 *"The DiSC profile aids us using and meeting at halfway and being proactive not just reactive"* PH3 *"It's useful as the students see us adapting our behaviour on the basis of the tool to deal with them as students based on their individual difference, which is actually modelling very nicely what they need to do with their patients"* LH3
Greater Insight into Students	
The DiSC comparison reports provided educators with detailed information regarding students' preferences at commencement of placement, which allowed them to have early awareness and understanding of students preferred ways of functioning. This created timely information that they could better plan learning experiences that were individualised for each student, enhancing students' progression on placement while minimising assumptions and conflicts through promotion of accepting individual differences.	*"having knowledge of my students' DiSC profiles allowed for streamlining of communication styles – instead of having to wait 2-3 weeks for these needs to become apparent during clinical practice, we were able to workshop beneficial strategies from day 1"* LH6 *"Having their DiSC profile meant I was aware of what [the student] was a bit more receptive to and I wasn't biased in what [the student] was doing"* PH3
Greater Insight into Self	
Educators identified that their own DiSC profile provided them with a framework to understand their own drivers of workplace behaviour, including greater understanding and planning of interactions with colleagues, students and patients for maximum benefit. With greater understanding of their own behaviours, educators were able to utilise the DiSC profile as a self-development tool to enhance their own communication and interactions through acceptance of individual behaviour preferences whilst reducing assumptions and biases.	*"I found it very interesting to have and a more objective measure looking at how I conduct myself in the workplace"* LH2 *"it showed me how I might be biased in thinking what I was doing was best, but maybe it wasn't the best for the student. I changed a couple of things I was doing, that I probably wouldn't have considered … beforehand"* PH3

Table 8
Qualitative categorisation and description of open-ended responses regarding concerns of using the Everything DiSC in clinical education

Category	Supporting Quotes
Internal Belief Challenges	
Educators spoke of learning about themselves through their own DiSC profiles, including descriptions of their profile that they didn't recognise in themselves. This created anxiety for some, about their own behaviour and interactions. Some feared being labelled by their DiSC style, without acknowledgement of their capacity to be flexible. Educator vulnerability was somewhat compensated by both student and educator sharing their information. There was concern about potential for misinterpretation (for example introvert/ extrovert) and development of preconceived ideas that might bias perceptions of the students and/or clinical educators. Some feared that educators and students might 'blame' their preferred behaviour style for poor behaviour or performance.	*"I was torn with the wording. Risk taking was quite high, and I was on the end of the spectrum and I guess I interpreted the word in a negative context."* LH4 *"I probably had some reservations about it, in that you might have preconceived ideas about what the students will be like, and they will about you as well."* PH2 *"can be used as an excuse by the student and by us [the clinical educator]. I'm probably guilty of actually [saying] "that's just them being a X DiSC style" … So, it can be a bit of a cop out if you let it."* LH3
External Pressures	
Timing of DiSC profile implementation and time commitment of utilising the profiles within a placement, were identified as key external pressures. Educators spoke of clinical placements already being a busy learning environment and the potential risk of not having enough time to refer to the DiSC profiles within the placement, or alternatively spending too much time on it and impacting on other aspects of clinical placement. Educators report that the preferred time to complete their profiles and receive the comparison reports were just prior to placement commencement, as implementation once placement commenced limited their ability to implement strategies and plan learning activities ahead of time.	*"we didn't necessarily have a lot [of time] to reflect on it [in the first week]. So, I suppose for me personally, if I was to do it again, I would set aside time to sit down. I might too, have it before hand, but sit down with them a little bit later"* PH1 *"If we (the CE's) had our profiles done early and when you do get the student with the DiSC profiles it is not taking any time out of your day and it is just up to the students to have it done"* PH3 *"My students didn't need it at that point [orientation], I needed it at that point. But for them it was a bit overwhelming"* LH1

Whilst a number of concerns were reported when prompted to answer the question, "What concerns do you have about using the DiSC in this way (if any)?", eleven of the twelve clinical educators participating in the focus groups stated that they had "nil" concerns with sharing their DiSC profiles with the students. Clinical educators had conflicting thoughts on the best timing for sharing the DiSC profiles and this is reflected in following quote:

> Overall, I think it was useful and yeah you could use some of the strategies with the students. I think the timing of it wasn't great for us (during placement) and, so that took out a whole afternoon of clinical time. I don't know, I think I would rather see them actually working clinically. So, if it is to be used, I think it needs to be done outside of the actual clinical hours and it needs to be done before. But then again, doing it then (during placement), you could sort of reflect on what you had already seen of them. So maybe you don't get that pre-bias. PH4

A number of clinical educators reflected on the importance of access to the DiSC facilitators and debriefing sessions and reported they felt it was imperative to have access to people who have specialized training in the application of the DiSC to prevent anxiety developing or misuse of the tool. The following quote is a representative of this conversation:

I guess I found it quite helpful. That the first time I looked at the profile was with (DiSC Facilitator X) … So, that helped, I didn't have that opportunity to read through it and make any preconceived notions about it. I think (DiSC Facilitator X) was quite careful in saying that this is the overall picture of someone who does have that DiSC profile, however, things will change throughout your practice and with your personal experiences. Mine was talking about difficulty making conversation with people, well actually, we make conversation with patients all day every day, that was something that I wouldn't necessarily agree with. Knowing that as I read through the profile, I could acknowledge that. LH2

V   DISCUSSION

The importance of a supportive clinical learning environment for learners has been well established in the empirical literature (Brown et al., 2011; D'Souza et al., 2015; Henderson et al., 2012; Pitkänen et al., 2018).

This novel, mixed methods, feasibility study investigated the quantitative and qualitative outcomes of an intervention aimed at creating a supportive clinical learning environment through shared debriefing of the Everything DiSC profiles and comparison reports between physiotherapy students and their educators. Specifically, we aimed to investigate if this intervention i) improved the clinical skills outcomes (grades) of physiotherapy students and ii) enhanced the perceived quality of clinical education experiences for students and/or educators compared to placements without this intervention.

In relation to our first aim, the results demonstrated no significant difference between the intervention and comparison groups in the level of student clinical competency (APP results). These findings indicate that the intervention did not provide any positive or negative impacts on the students' performance. Previous research has identified specific DiSC styles (D and Si) associated with stronger performing students or students likely to fail a clinical placement (i and CS) (Milne et al., 2019). It is possible that the distribution of students with these DiSC styles within the intervention and comparison groups could potentially have impacted the outcomes. The comparison and intervention group's global DiSC styles differed, with a higher percentage of D and S profiles in the intervention group and a higher percentage of C profiles in the comparison group. The specific DiSC styles of students in each group revealed that in the intervention group there was one more student likely to fail a placement (i.e., students with i and CS styles) and three more students with stronger performing DiSC styles (D and Si) than the comparison group. Considering this larger variation in DiSC styles, it would have been reasonable to expect the APP results of the intervention group to have a higher standard deviation in APP scores than the comparison group. This did appear to be the case with a greater standard deviation in total APP percentage in the intervention group compared to the comparison group. Future research could look at matching the student groups by individual DiSC styles, in addition to gender and placement type, to see if the outcomes of the intervention differed to those in the present study.

In addressing the student component of our second aim, the results of this study demonstrated that students' perception and satisfaction with the clinical learning environment during placement (CLEI actual) were not significantly different between the intervention and comparison groups. These findings suggest that the addition of the DiSC workplace profiles and comparison reports as a tool to facilitate interactions and establishment of strategies to enhance placement experiences were no more beneficial, from the students' perspective, than usual clinical education experiences. This finding is in contrast to previous findings where students have valued individualised interactions with their clinical educators (Brown et al., 2011; d'Souza et al., 2015; Henderson et al., 2010; Pitkänen et al., 2018) utilising open, effective, two-way communication (Brown et al., 2011), although the authors of this study acknowledge that it is possible that the interactions between student and educator in the non-intervention settings were also individualised. Students' satisfaction with clinical educator performance (MCTQ) was also shown to not be significantly different between students in the intervention and comparison groups. These findings suggest that the detailed information on students' individual behaviour preferences provided to clinical educators through the DiSC workplace profile and comparison reports had no change on the students' perception of their clinical educators' performance. This is also in contrast

to previous studies, where students have identified more positive supervisory relationships and experiences were associated with increased one-to-one reflection time (Pitkänen et al., 2018) and enhanced collaboration with their clinical educators (d'Souza et al., 2015). This contrast in findings from the present study to those in previously published literature, could potentially be attributed to the low completion rates of both the CLEI-actual and MCTQ by the students in both the intervention and comparison groups, not yielding enough data to draw comparisons. Alternatively, the utilisation of DiSC profiling and collaborative sharing of student-educator comparison reports alone may not be beneficial to the student in the clinical placement environment. Previous research (Milanese et al., 2013) has indicated that physiotherapy students' most valued learning activities on clinical placement, leading to satisfaction, involve patient-centred learning activities. So, if clinical educators in the intervention and comparison groups offered relatively equal exposure to patient-centred learning activities, it may have influenced the student's satisfaction with the learning environment more than the focus on getting to know the student as an individual via the Everything DiSC profiles. Further, with approximately 60% (intervention group) and 70% (comparison group) of students in our study having DiSC profiles in the C and S styles (i.e., styles that do not tend to openly share personal details about themselves), it is likely that there was some degree of discomfort with sharing information about their personal behaviour preferences and their focus driving satisfaction may well have been more strongly aligned to patient-centred experiences.

Despite student perception and satisfaction with the clinical learning environment or clinical educator performance not being different between intervention and comparison groups, clinical educators favoured the use of the DiSC tool in clinical education settings. This addresses the final component of our second study aim. In the present study, clinical educators identified that the DiSC workplace profiles and comparison reports provided a framework for improved quality of communication between the clinical educator and physiotherapy student/s. This improved interaction between students and educators was attributed to three categories: i) reciprocal sharing of information with strategies provided to improve interactions and enhance two-way communication; ii) greater insight into students and their preferred ways of functioning saved time and minimised tension and conflict, allowing the educator to implement strategies earlier in the placement; and iii) greater insight into self (educators) and their own behaviours and preferences for functioning in the workplace, reducing initial bias, minimizing assumptions and increasing acceptance of different behaviour preferences. Previous research suggests that by knowing the learners' other forms of knowledge such as communication skills and management of emotions and behaviours, educators can assess the learners' abilities more accurately (Parsell & Bligh, 2001) and therefore make individualised adjustments for increased clinical placement success. This learning concept is important when considering that many allied health clinical educators have not had any formal training in clinical education prior to commencement as a clinical educator, with some educators commencing a clinical educator role within the first two years practice (Gandy & Jensen, 1992; Orest, 1995). Physiotherapy clinical educators can and are encouraged to access introductory clinical education courses. However, educating students requires a wide-range of teaching knowledge (Parsell & Bligh, 2001) that might not be covered in introductory workshops. Furthermore, educators commonly report that one of the disadvantages of clinical placements is the increased workload required to supervise students, in addition to their other tasks, which has the potential to negatively impact job satisfaction (Sevenhuysen & Haines, 2011). Therefore, it is not surprising that clinical educators favoured utilising the DiSC tool with the objective of enhancing communication and saving time.

The present study has demonstrated that clinical educators' utilisation of the DiSC workplace profiles and comparison reports are helpful in supplementing previously developed knowledge and skills in clinical education, providing insight into clinical educator's own preferences and those of the students within the workplace. Similarly, effective two-way communication has been demonstrated as an important factor within the clinical learning environment (Brown et al., 2011) with clinical educators possessing a variety of communication and interpersonal skills that potentially impact on the educator to student relationships (Attrill et al., 2015). The reciprocal sharing of DiSC profiles in this study allowed students to have insight into the clinical educators'

preferences and vice versa, allowing students and clinical educators to enhance and develop their own inter-personal communication and interactions (McAllister & Lincoln, 2004).

In addition to creating enhanced interactions through reciprocal sharing of DiSC profiles, the clinical educators found the intervention process to be an effective method of establishing expectations and problem-solving strategies with the students. Previous research in medical education (Parsell & Bligh, 2001) reported similar findings through the implementation of open discussion and agreement between clinical supervisors and students regarding objectives and development during clinical placements. The initial sharing and discussion of DiSC profiles in the present study could therefore have been one method for providing a scaffold that aids in outlining placement expectations, learning objectives and development opportunities for placement success.

Although the 'Everything DiSC' does not require any previous training for respondents to understand their profile, the authors of the DiSC manual (Scullard & Baum, 2015) suggest that the instrument is likely to be more engaging and impactful if respondents have greater insight into the tool. The various levels of insight into the utility of the DiSC as a learning tool was apparent within the present study with some clinical educators having difficulty in processing their own profile information or not utilising the profile as readily within the clinical placement, without the support and debriefing of a trained DiSC facilitator on site. This suggests that it is vital to have a trained DiSC facilitator when utilising DiSC profiles and it is possible that with more training of the clinical educators regarding the DiSC and application within clinical placement, that the results for students may differ due to greater understanding and utility of the tool by clinical educators. Additionally, if educators were aware of the attributes within the DiSC styles that were associated with a higher likelihood of failing a placement, they may have been able to address these more directly at placement commencement. There are, however, potential risks with highlighting this to clinical educators, with students being labelled "a failing student" prior to placement commencement, when not every student with the identified DiSC styles (i and CS) fail placements (Milne et al., 2019). Alternatively, building awareness of attributes associated with successful outcomes for students on placement and fostering these during clinical placements might also yield improved positive results for students. This however would require significant upskilling of the clinical educators with associated financial investment in the professional development of clinical educators wishing to use the DiSC as a tool for enhanced interactions with students in clinical education contexts.

Overall, the qualitative results of the present study demonstrate that clinical educators see the potential utility of the 'Everything DiSC' workplace profile, although sharing of DiSC profiles and comparison reports within the clinical placement environment alone might not be enough to improve clinical placement grades for students and some fears do exist with sharing DiSC styles between students and clinical educators. As some DiSC styles are a predictor of less favourable outcomes on the APP (Milne et al., 2019), perhaps the DiSC would best be implemented with students whose DiSC styles are predictive of clinical placement failure at a university level in preparation for clinical placement. As the results of this study did not show enhanced APP grades for students in the intervention group, future research could explore pre-clinical utility of the Everything DiSC for enhancing students' awareness of behaviours that are more likely to result in failed clinical placements and instead build capacity in developing behaviours associated with more positive clinical placement outcomes.

For the associated costs and administrative requirements of generating both DiSC profiles and comparison reports for clinical educators, the findings of this study would suggest that the benefits of utilising the 'Everything DiSC' comparison reports between students and clinical educators are not significantly beneficial for obtaining improved levels of performance (i.e., higher APP outcomes) or student satisfaction during clinical placements. However, further research of pre-clinical placement utility with students (who, based on their DiSC profiles, are more likely to fail a clinical placement) is warranted to assist in developing insights into the attributes that possibly contribute to difficulties on placement. It is important to note that all participants within the present study, including students in the comparison group, knew their individual DiSC style. Therefore, it

is possible that the students in the comparison group were also equipped with knowledge that identified their own behaviours and potentially applied this knowledge to improve their relationship with educators and clinical performance during the placement, potentially equalizing the results between groups in the study. It is plausible that the impact and utility of the DiSC may be with the students knowing about their own styles and other possible styles without the educators requiring this knowledge. Future research could investigate this further, establishing if students who did not know their DiSC style prior to placement had different clinical placement outcomes.

A *Study Limitations*

Being a feasibility study, the study cohorts and number of intervention settings were relatively small. This may have led to the findings that utilisation of the 'Everything DiSC' was not significantly beneficial to increase both clinical placement outcomes or student satisfaction on placement. Similar studies with larger participant cohorts, or the addition of student focus groups (similar to that of the clinical educators), may exhibit different results. Additionally, 26 of the comparison group students had awareness of their DiSC profiles prior to their placement. As such, this could have enhanced their own awareness of behaviours and influenced the results. Perhaps the blinding of the comparison group to their DiSC profile would have showed more significant differences between the intervention and comparison groups and could be examined in future research.

There was also a higher distribution of DiSC style C educators than we might have expected, based on previous research demonstrating some occupational characteristics are likely to be more attractive to individuals with specific DiSC styles (Scullard & Baum, 2015). The DiSC S has a moderate relationship with occupational membership for health care workers and Si style for teacher/educators (Scullard & Baum, 2015). These previous findings regarding occupational membership and its relation to particular DiSC styles, differed to our clinical educator distribution of DiSC styles and this may have impacted the results. Additionally, the DiSC profiles of the clinical educators in the comparison group were not explored, so comparisons could not be drawn on the equality of distributions between educators in the different groups. Furthermore, whilst multiple potential confounders were explored in the analysis, it is possible that other confounders existed (i.e., stressors during placement) that were not measured as part of the intervention which may have impacted the results of the study.

VI   CONCLUSION

Physiotherapy clinical educators value the utility of the Everything DiSC Profile and associated comparison reports and suggest that they aid in providing a framework for communication, clarifying expectations, and identifying individual learning needs of physiotherapy students earlier within the clinical placement. Findings from this study revealed that the use of the Everything DiSC workplace profile and comparison reports did not improve students' clinical placement outcomes or satisfaction on placement. As there are two known DiSC styles (with associated behaviours) that are more likely to fail a clinical placement, future research could explore the utility of the Everything DiSC with these students completing pre-clinical coursework in physiotherapy programs, targeted intervention or support during their first placement, or the DiSC could be used as a supplementary tool during remediation processes to enhance desirable behaviour attributes and increase student awareness of behaviours that are more likely to result in less favourable outcomes during clinical placement.

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