# Evaluating placement quality: Rasch-based validation of the Clinical Placement Quality Survey - Student

TARYN JONES[1]
BRETT DYER
SIMONE HOWELLS
*Griffith University*, Gold Coast, Australia
TANYA PALMER
*Central Queensland University,* Bundaberg, Australia
LARISSA SATTLER
*Bond University,* Gold Coast, Australia
KATRINA ARCHBALD
JOEL GARRET
EMILY WILLIAMS
CHRISTINE RANDALL
ANDREA HAMS
*Griffith University*, Gold Coast, Australia

Health workforce readiness in part relies on the quality of placement experiences, but there are few validated tools to systematically capture students' perceptions. The Clinical Placement Quality Survey – Student (CPQS-S) was developed to capture health students' perceptions of placement quality, aligned with the Best Practice Clinical Learning Environment framework. This study evaluated the psychometric properties of the CPQS-S using Rasch analysis across multiple health disciplines, including clinical exercise physiology, exercise science, nutrition and dietetics, occupational therapy, physiotherapy, rehabilitation counselling, social work, and speech pathology. Responses from 933 students were analyzed in development and validation samples. The CPQS-S was found to measure a unidimensional construct, with items demonstrating strong fit and high separation reliability. These results support the CPQS-S as a reliable instrument for assessing student perceptions of placement experiences. Its validated structure highlights its potential to inform quality improvement initiatives across a range of traditional and broader work-integrated learning settings.

Keywords: Work-integrated learning, student perceptions, placement experience, interprofessional, psychometric validation, health education

Student placements are foundational for the development of health professionals, facilitating the transition from theory to practical application (AHPRA Accreditation Committee, 2023; Penman et al., 2023). The term 'placement' is intended to be an inclusive term for experiences that may also be called, clinical placements, practice education, supervised practice, field education or professional practice. In Australia, health professional programs include substantial placement components (Penman et al., 2023). These experiences typically require students to demonstrate safe, effective, and ethical management of clients across diverse healthcare settings to ensure they are practice-ready upon graduation (AHPRA Accreditation Committee, 2023). Placement enables students to apply their skills under the supervision of professionals while being assessed on their capabilities in real-world environments. The benefits extend beyond individual student development, enhancing academic rigor for universities and providing healthcare organizations with a workforce equipped for professional

[1] Corresponding author: Taryn Jones, taryn.jones@griffith.edu.au

practice (Hamiduzzaman et al., 2024). Through this experiential learning, students, universities, and healthcare institutions collectively contribute to the development of a capable, adaptable workforce.

The Australian health workforce, particularly within the health sector, is facing significant challenges due to workforce shortages and growing demand for healthcare professionals (Australian Institute of Health and Welfare, 2024). Key factors driving this demand include population growth and an aging demographic, which are intensifying the need for staff and health services (Australian Institute of Health and Welfare, 2024). This, in turn, has led to an increasing demand for student placements, a trend expected to continue with the expansion of university health programs, larger student cohorts, and evolving workforce needs (McBride et al., 2020). For placement stakeholders, building capacity to provide sustainable placement numbers remains a persistent challenge. To ensure this rising placement demand does not compromise the quality of learning experiences, robust mechanisms are required to ensure both adequate placement capacity and high educational standards.

Placement quality is key for achieving positive outcomes for all stakeholders. For the public, including clients, the participation of students in healthcare delivery can enhance access to safe, competent, and ethical services (Hams et al., 2022; Pigott et al., 2022). For students, high-quality placements foster the development of essential capabilities such as adaptability, interprofessional collaboration, and conflict resolution (Greenlees et al., 2021). Moreover, placements that provide a supportive learning environment promote student wellbeing (Ahern & O'Donnell, 2022; Bell et al., 2024). Universities also benefit from quality placements, as they help produce graduates who are well-prepared for the workforce and meet the expectations of regulatory bodies and public standards (Universities Australia, 2019). Prior research has shown that placement quality is a stronger predictor of employability than factors like placement structure or duration (Smith et al., 2019). For healthcare providers, effective placements are a valuable tool for workforce development, contributing to the training of professionals who are ready to deliver high-quality client care upon graduation (Bell et al., 2024).

While there are existing tools to evaluate placement quality from different stakeholder perspectives, the Clinical Placement Quality Survey – Student (CPQS-S) is specifically designed to capture students' perceptions (Jones et al., 2022). Students are central stakeholders in the placement environment and can highlight aspects of quality that may otherwise be overlooked. Unlike tools created for nursing or medicine, which do not reflect the diverse clinical experiences across multiple disciplines, or instruments like the Clinical Placement Quality Survey – Educator (Hargreaves et al., 2024),the Maastricht Clinical Teaching Questionnaire (Stalmeijer et al., 2010) and Generic Supervision Assessment Tool (Hamilton et al., 2022), which focus on the placement provider's viewpoint, the CPQS-S was developed to capture the unique aspects of placement quality from the perspective of Allied health students.

Health professional education encompasses a diverse range of professions, each with distinct practice environments, professional competencies, educational and accreditation requirements (Penman et al., 2023). The initial validation of the CPQS-S by Jones et al. (2022) focused on a limited cohort of students. Whilst the tool demonstrated psychometric robustness, its generalizability to broader sectors warranted further exploration. Given the evolving demands on placements and the increasing diversity in student cohorts across health professional education, it was appropriate to test the CPQS-S across a broader range of disciplines and settings. A more diverse sample encompassing students from multiple disciplines and across university programs would enable a more comprehensive understanding of how students perceive placement quality. Subsequent analysis could support the hypothesis that the CPQS-S is a versatile tool that reflects the unique needs and experiences of students,

ensuring consistent and comprehensively evaluation of placement quality across this critical sector of healthcare education. The purpose of this study was to investigate the psychometric properties of the CPQS-S using Rasch analysis (Rasch, 1960), to determine if the CPQS-S is an appropriate instrument to measure student's perception of quality of their placement experience.

## METHODS

### *Ethics Considerations*

Ethical approval for the study was granted by the Griffith University Human Research Ethics Committee (HREC 2022/681), Bond University Human Research Ethics Committee (2022/681) and CQUniversity Human Research Ethics Committee (0000024099). Participants were informed that their involvement was voluntary and would be anonymous.

### *Study Design*

This was a cross-sectional study using Rasch analysis. Rasch analysis offers a rigorous psychometric evaluation by placing items and respondents on a common scale, allowing for precise assessment of item acceptability and response consistency across groups (Bond & Fox, 2015).

### *Instrument*

The CPQS-S has 32 items with a mix of question types including binary response, Likert scale and open written responses. Its foundation is in the Best Practice Clinical Learning Environment (BPCLE) framework (Victoria Department of Health, 2024). This framework identifies five primary indicators of clinical placement quality (Victoria Department of Health, 2024). The CPQS-S incorporates these indicators and tailors them to assess the student perspective at the conclusion of each placement. The CPQS-S has demonstrated high internal consistency across its items, making it a useful tool for placement stakeholders to gather student feedback. The full CPQS-S tool including open response questions has been previous published (Jones et al., 2022). Binary and Likert responses were included for analysis in this project and are included in the original publication by Jones et al. (2022). Terminology within the CPQS-S was adapted to suit each discipline, with terms such as 'supervisor' used instead of 'clinical educator', 'practice presentations' and 'practice environments' used in place of 'clinical presentations' and 'clinical environments', and the terms 'patients', 'clients', or 'service users' used interchangeably based on context. A description of the program structure for each discipline is included in Appendix A.

### *Participants*

Data collection prospectively occurred from January to December 2023 from eight disciplines across three Australian universities. Students from clinical exercise physiology, exercise science, nutrition and dietetics, occupational therapy, physiotherapy, rehabilitation counselling, social work and speech pathology were invited to complete the CPQS-S at the end of a placement.

### *Data management*

The CPQS-S responses were collected by the digital platform of choice utilized by each program. The responses were downloaded, de-identified and collated for analysis.

*Sample Size*

The minimum sample size was set to 320 participants using the recommendations outlined by Linacre (2002).

*Sample*

The participant responses were divided into two samples for the development and validation of the Rasch analysis. The outputs of both the development and validation sample are presented in the results section. Due to the volume of physiotherapy responses, both the development and validation samples were weighted to have a balanced representation between the physiotherapy respondents and the other respondents. The weighting procedure involved assigning weights based on the inverse probability of discipline membership. Physiotherapists were weighted by one divided by the probability of being a physiotherapist, while non-physiotherapists were weighted by one divided by the probability of not being a physiotherapist. A description of the demographics for each discipline is included in Appendix A.

## *Rasch Analysis*

Rasch analysis rating scale modelling (Tennant & Conaghan, 2007) was performed in R statistical software (R Core Team, 2023) with user written packages TAM (Robitzsch et al., 2024), WrightMap (Irribarra & Freund, 2014), ErM (Mair & Hatzinger, 2007) and tidyverse (Wickham et al., 2019). Both dichotomous and polytomous items within the CPQS-S development and validation datasets were analyzed simultaneously (Andrich & Maraiss, 2019; Bond & Fox, 2015; Tennant & Conaghan, 2007).

*Dimensionality*

Uni-dimensionality is a critical assumption of Rasch analysis, meaning that items should primarily measure one underlying trait (Andrich & Maraiss, 2019). To reconfirm the dimensionality of the current data sets, principal component analysis was conducted, and a scree plot was generated to examine the number of underlying factors.

*Reliability and Separation Index*

Four statistical measures were used to assess the quality of the CPQS-S. Item reliability indicated the consistency of the item acceptability estimates, while person reliability indicated the consistency of the person ability estimates. Item and person reliability values for these measures range from 0 to 1 where a higher value (above 0.8) indicated strong reliability (B. D. Wright & Linacre, 1994). The separation index reflected how well the items could be separated into different levels of agreement regarding placement quality. Person separation index reflected how well the participants could be separated into different levels of agreement (or different levels of their experiences of quality). A value of two, for example, would indicate that the items could be separated into different levels.

*Person Ability (logits)*

Person ability (logits) evaluated data from each respondent to measure the agreement of each item. In the context of CPQS-S, a logit reflects the level of endorsement, agreement or acceptability of an item rather than difficulty. For example, a lower logit would reflect items that are more easily accepted or endorsed by the participants. A Wright map was used as a graphical representation of item endorsement (in logits) and respondent ability on the same scale. The graphical representation assists

to evaluate how well the items are aligned with the agreement of the participants. The vertical axis scale is in logits, where higher logits represent items that are more difficult to agree with and the lower logics are items that are easier to agree with. The horizontal axis represents each item in the CPQS-S. The histogram on the left panel displays the participants endorsement along the same logit scale.

*Item Fit*

Item fit evaluated the fit of each item of the CPQS-S data to the model. Two test statistics were used to evaluate the item fit for each item in the CPQS-S. It was expressed as item infit (information-weighted mean square) and outfit (outlier-sensitive mean square). Regarding the CPQS-S, item infit reflected how well an item performed when targeted to individuals of similar ability. Item outfit, on the other hand, was sensitive to unexpected responses from individuals. Unexpected item infit and outfit values were reviewed to determine if they degraded the tool (Linacre, 2012). Items that did not fit the model and degraded the development data on subsequent analysis would be removed from the validation data.

*Person Fit*

Person fit evaluated how well the observed data aligned with the expectations of the Rasch analysis model. Two test statistics were used to evaluate the data. It was expressed as person infit (information-weighed mean square) and person outfit (outlier-sensitive mean square). Person infit reflected the consistency of responses to items that were well-targeted to a person's acceptability of that item, while person outfit was sensitive to unexpected responses on items (B. D. Wright & Linacre, 1994).

*Category Functioning and Ordering*

All CPQS-S items were evaluated regarding threshold ordering and targeting. It was anticipated that items would be ordered, meaning that the more a participant agreed with this item the more likely they would select a higher category. Threshold targeting indicated how distinct the categories were from each other. A larger spread between the thresholds would indicate how distinct the categories were from each other. A graphical representation was used to visualize threshold ordering and targeting. The rating scale model assumes that the distance between thresholds is the same for each item.

## RESULTS

*Participants*

A total of 933 CPQS-S survey responses were collected for analysis. The largest proportion of participants were in the 20 to 24-year age range, which represented 35% of the sample. Within this cohort, 72% identified as female, 3.8% identified as First Nations, 10% were international students, and 13% reported having a disability. The data were divided into a development (n = 466) and validation (n = 467) sample. Missing data were minimal, with less than 0.35% data points missing. Table 1 outlines CPQS-S responses received by each discipline and sample for inclusion in data analysis.

*Dimensionality*

The single underlying construct was hypothesized to be student perceptions of placement quality. The factors from principal component analysis scree plot are presented in Figure 1. The steep drop-off after the first component suggested that most of the variance in the validation dataset was explained by a

single component, indicating a strong unidimensional structure. This finding supported the assumptions for Rasch analysis.

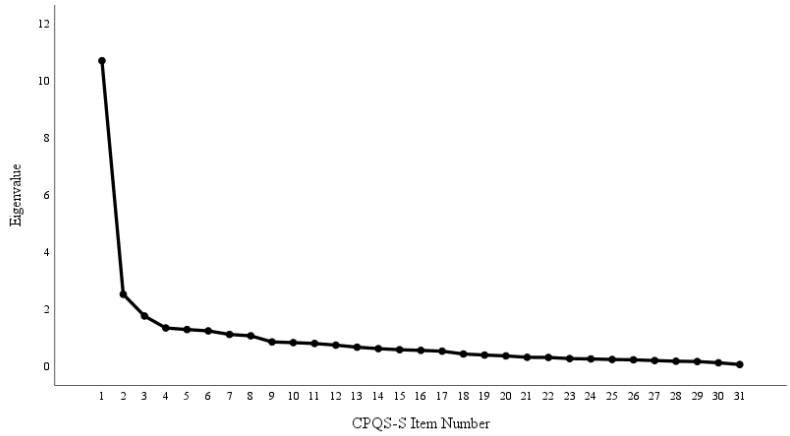
TABLE 1: Distribution of CPQS-S responses across disciplines for sample 1 (development) and sample 2 (validation).

| Health Discipline | CPQS-S Responses | Sample 1 Development | Sample 2 Validation |
|---|---|---|---|
| Clinical Exercise Physiology | 48 | 24 | 24 |
| Exercise Science | 18 | 11 | 7 |
| Nutrition and Dietetics | 5 | 3 | 2 |
| Occupational Therapy | 68 | 32 | 36 |
| Physiotherapy | 687 | 352 | 335 |
| Rehabilitation Counselling | 3 | 3 | 0 |
| Social Work | 34 | 11 | 23 |
| Speech Pathology | 70 | 30 | 40 |
| Total | 933 | 466 | 467 |

*Reliability and Separation Index*

Four measures were used to assess the quality of the CPQS-S. Item reliability values for the development and validation samples were 0.96 and 0.97 respectively, indicating consistency of item agreement estimates. Person reliability for the development and validation samples were 0.80 and 0.82 which indicated appropriate consistency of the person ability estimates. Item separation index for the development and validation sample were 4.87 and 5.45 which indicated that items could be separated into different categories. The person separation index for the development and validation sample was 2.03 and 2.11 which suggested that the respondents could be separated into two different levels of acceptability.

FIGURE 1: The scree lot of actual factors from principal component analysis. Eigenvalues indicate the amount of variance in the data explained by each component or factor.



*Item Fit*

Item fit statistics are presented in Table 2 for both the development and validation sample. Analysis of the development sample indicated good overall model fit, though some items required further investigation due to infit and outfit misfit. Items 27, 29, 30, and 31, with high outfit MNSQ values, were reviewed. Item 27 pertained to non-clinical tasks, item 29 addressed assessment fairness, item 30 related to patient interaction, and item 31 concerned student confidence. The Rasch analysis was repeated for each misfitting item whereby the item was removed to assess its impact on item reliability and person separation. As shown in Table 3, item removal had minimal effect on these parameters, supporting the decision to retain these items in the CPQS-S for the validation sample analysis. However, item 32, concerning university contact, was excluded from the development and validation sample based on prior research and the content of the question not being referenced in the BPCLE.

*Person Ability (logits)*

Figure 2 presents the threshold and Wright item-person map for the validation sample. The CPQS-S items were generally well-targeted to the respondents, covering a broad range of acceptability. The alignment between the respondents and the items indicated that the items of the CPQS-S effectively measured the varying levels of acceptability among the validation sample. The distribution of person abilities (left axis) was skewed, with more respondents clustered towards the higher end of acceptability. The item distribution (right axis) showed items across the acceptability scale range. Most items demonstrated satisfactory category functioning, with clear and ordered thresholds across the response categories. The middle categories displayed well-ordered thresholds which suggested that respondents could reliably distinguish between levels of agreement for the items.

*Person Fit*

Most respondents (75%) had person infit distances from one that were 0.53 or less which indicated a generally good fit to the Rasch analysis model. The typical respondent's data aligned well with the model's expectations, though some moderate deviations are observed. The majority of respondents (75%) had outfit distances from one that are 0.71 or less which indicated that most respondents' data fit the Rasch model well, even when accounting for outlier responses.

TABLE 2: Item statistics from the development and validation samples including item acceptability (in logits), infit and outfit mean square.

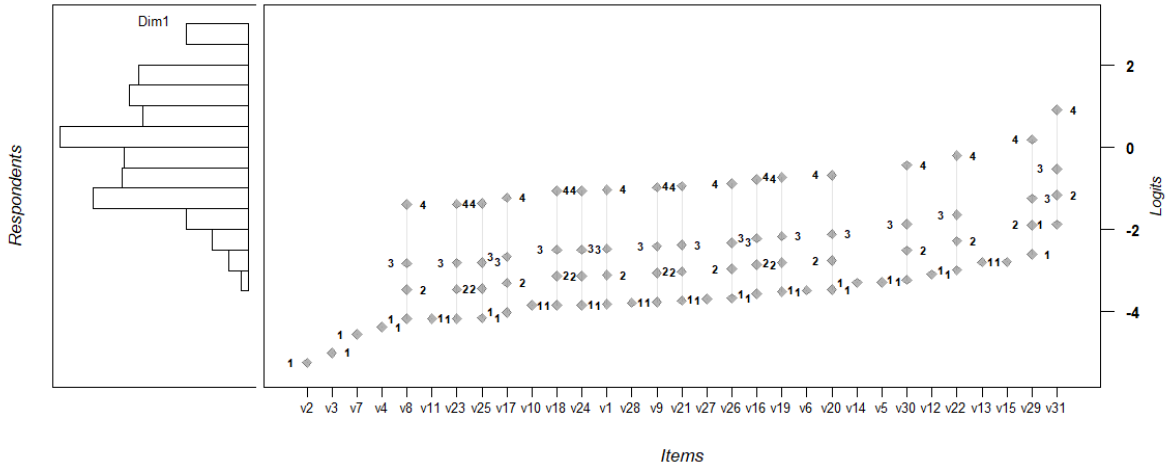
| | Development Sample n = 466 | | | | Validation Sample n = 467 | | | |
|---|---|---|---|---|---|---|---|---|
| Item | Item acceptability (logits) | SE | Infit MNSQ | Outfit MNSQ | Item acceptability (logits) | SE | Infit MNSQ | Outfit MNSQ |
| 1 | -2.421 | 0.077 | 1.029 | 1.723 | -2.691 | 0.083 | 0.890 | 1.380 |
| 2 | -3.910 | 0.375 | 1.007 | 1.219 | -3.233 | 0.443 | 1.043 | 1.426 |
| 3 | -4.018 | 0.394 | 0.952 | 1.124 | -2.988 | 0.397 | 0.962 | 1.259 |
| 4 | -4.406 | 0.472 | 0.963 | 0.494 | -2.368 | 0.302 | 0.974 | 1.361 |
| 5 | -2.687 | 0.224 | 0.970 | 1.667 | -1.276 | 0.196 | 0.897 | 1.242 |
| 6 | -2.559 | 0.213 | 1.099 | 2.105 | -1.474 | 0.211 | 1.041 | 1.996 |
| 7 | -4.393 | 0.469 | 0.927 | 0.372 | -2.542 | 0.325 | 0.894 | 1.777 |
| 8 | -2.956 | 0.091 | 0.810 | 1.498 | -3.039 | 0.093 | 0.976 | 1.529 |
| 9 | -2.395 | 0.077 | 0.871 | 1.740 | -2.640 | 0.081 | 0.870 | 1.628 |
| 10 | -3.091 | 0.263 | 0.881 | 0.722 | -1.838 | 0.242 | 0.798 | 0.615 |
| 11 | -3.165 | 0.272 | 0.920 | 1.238 | -2.164 | 0.276 | 0.806 | 0.468 |
| 12 | -2.395 | 0.202 | 0.985 | 1.735 | -1.092 | 0.184 | 0.853 | 1.080 |
| 13 | -1.933 | 0.172 | 0.920 | 1.237 | -0.799 | 0.169 | 0.920 | 1.212 |
| 14 | -2.320 | 0.196 | 0.913 | 1.161 | -1.288 | 0.198 | 0.853 | 0.935 |
| 15 | -2.083 | 0.200 | 0.857 | 0.788 | 1.103 | 0.087 | 0.483 | 1.271 |
| 16 | -2.398 | 0.077 | 0.762 | 1.328 | -2.447 | 0.077 | 0.708 | 1.480 |
| 17 | -3.053 | 0.095 | 1.118 | 1.844 | -2.883 | 0.088 | 0.958 | 1.463 |
| 18 | -2.763 | 0.086 | 0.745 | 1.241 | -2.717 | 0.083 | 0.716 | 1.173 |
| 19 | -2.318 | 0.075 | 0.649 | 1.244 | -2.398 | 0.075 | 0.701 | 1.364 |
| 20 | -2.266 | 0.074 | 0.807 | 1.418 | -2.349 | 0.074 | 0.784 | 1.353 |
| 21 | -2.529 | 0.080 | 0.725 | 1.209 | -2.609 | 0.081 | 0.843 | 1.349 |
| 22 | -1.930 | 0.067 | 1.008 | 1.951 | -1.889 | 0.066 | 0.996 | 1.840 |
| 23 | -3.227 | 0.100 | 1.065 | 1.173 | -3.029 | 0.093 | 0.883 | 1.008 |
| 24 | -2.753 | 0.086 | 0.819 | 1.325 | -2.715 | 0.083 | 0.825 | 1.335 |
| 25 | -2.859 | 0.088 | 0.907 | 1.160 | -3.017 | 0.092 | 0.927 | 1.100 |
| 26 | -2.481 | 0.079 | 0.972 | 1.611 | -2.549 | 0.079 | 1.282 | 1.976 |
| 27 | -3.182 | 0.273 | 1.057 | 2.786 | -1.687 | 0.228 | 1.057 | 2.791 |
| 28 | -2.903 | 0.243 | 0.960 | 1.043 | -1.777 | 0.237 | 0.969 | 1.618 |
| 29 | -1.418 | 0.061 | 2.644 | 5.121 | -1.509 | 0.060 | 2.688 | 5.169 |
| 30 | -2.124 | 0.071 | 2.005 | 4.752 | -2.116 | 0.070 | 1.683 | 3.549 |
| 31 | -0.644 | 0.054 | 1.360 | 3.442 | -0.782 | 0.054 | 1.389 | 3.533 |

TABLE 3: Impact of item removal on reliability and separation indices for the CPQS-S.

| Item | Content of item | Item Reliability* | Person Separation* | Interpretation | Action |
|---|---|---|---|---|---|
| 27 | Space to complete non-clinical tasks | 0.97 | 2.11 | Changes to item reliability and person separation are negligible. From a statistical standpoint their inclusion or exclusion is negligible. Each item is a feature of the BPCLE framework. | Retain in CPQSS |
| 29 | Assessment was fair and transparent | 0.97 | 2.15 | | |
| 30 | Direct to patient/client interaction care | 0.97 | 2.16 | | |
| 31 | Rate your confidence to practice | 0.97 | 1.9 | | |

* Values relate to the subsequent Rasch analyses where that specific item removed.

FIGURE 2: The threshold and Wright item-person map for the CPQS-S validation sample.




## DISCUSSION

This study provides new evidence supporting the CPQS-S as a valid, 31-item tool that effectively measures students' perceptions of placement quality across a broad range of disciplines. The CPQS-S captures a single underlying construct of student perception of placement quality and can reliably differentiate between varying levels of perceived quality. Notably, it is the first tool of its kind to be applicable across a diverse range of health professions. The CPQS-S addresses a significant gap in the health work integrated learning setting by demonstrating its relevance across various placement settings, including hospitals, community health, aged care facilities, schools, private practices, pediatric services, mental health services, sports clinics, and research institutions. In contrast to existing tools that focus on specific disciplines, the Rasch analysis validation of the CPQS-S encompassed a wide range of disciplines, highlighting the surveys versatility and robustness.

This study builds on previous work confirming that the CPQS-S predominantly measures a single dimension, hypothesized as student perception of placement quality (Jones et al., 2022). By evaluating CPQS-S data across themes, the tool facilitates both an overarching assessment of placement experience and a focused evaluation of elements linked to the BPCLE framework. The high item reliability values demonstrated that the CPQS-S provided consistent measurement of item agreement estimates, reflecting true differences in item acceptability rather than measurement error (Andrich & Maraiss, 2019). Similarly, the person separation values demonstrate the tool's ability to differentiate between

individuals with varying perceptions of placement quality. Although some uncertainty may exist in differentiating between those individuals with moderate perceptions, the CPQS-S can reliably categorized individuals into high and low strata of placement quality (Andrich & Maraiss, 2019). The item separation index indicated that the CPQS-S items covered a wide range of acceptability levels and were well-distributed across the latent trait of perceived placement quality. This combined with the high item reliability, means that the items were well-targeted and diverse enough to assess the full range of a student's perceptions of placement quality (Andrich & Maraiss, 2019). Overall, the CPQS-S Rasch analysis demonstrated a reliable tool that could identify respondents with different perceptions of their placement quality experience. Further, there was an appropriate level of separation, indicating that the CPQS-S was capable of reliably categorizing individuals into different perceptions strata.

For this project, the CPQS-S was implemented across multiple health professional programs, necessitating attention to discipline-specific terminology to ensure that item wording remained applicable and meaningful. For example, terms such as 'supervisor' were used in place of 'clinical educator' where appropriate, preserving the face and content validity of each item. This interprofessional implementation raised considerations regarding the title of the tool, particularly the 'clinical' element, as the tool's utility may extend beyond traditional clinical placements to broader work-integrated learning contexts.

Some CPQS-S items warranted review. Item 32 related to contact with the university and was removed from both the development and validation samples. This item was not directly linked to the BPCLE framework and did not align with any themes in the previous publication, supporting its exclusion in this study. However, all remaining items were retained due to their alignment with the BPCLE framework and their overall contribution to the tool's validity, in such they added information rather that statistical 'noise' (Andrich & Maraiss, 2019). Statistical and pragmatic considerations affirm that the CPQS-S items represent key aspects of students' perceptions of placement quality. Therefore, to ensure data integrity, all 31 items, are recommended for inclusion in future applications of CPQS-S. Building on these foundational considerations, the CPQS-S holds potential to drive advancements in All similar to those from discipline specific tools.

The implementation and impact of the Clinical Learning Environment, Supervision, and Nurse Teacher Scale (CLES+T) may provide a roadmap for the CPQS-S. The CLES+T, which has had a significant impact on nursing education, offers insight into how the CPQS-S can inform improving clinical learning environments, educational practices, and contributing to research in health professional education (Saarikoski, 2008). Through rigorous psychometric testing and international application CLES+T has become a key tool for enhancing nursing pedagogy (Ozga et al., 2020; Papastavrou et al., 2016). However, other health disciplines face barriers when seeking comparable tools suitable for broad interdisciplinary application. Existing tools such as the Maastricht Clinical Teaching Questionnaire (Stalmeijer et al., 2010) and Generic Supervision Assessment Tool (Hamilton et al., 2022) emphasize teaching and supervision aspects of placements, rather than comprehensive quality assessment. While the Improving Quality In Practice Placements (iQIPP) framework has broader applicability it is primarily applied prior to placements rather than after the experience (Rodger et al., 2010). In contrast, the CPQS-S emerges as a more comprehensive solution for assessing placement quality applicable to a diverse range of stakeholders, this utility and focus on overall placement experience mark the CPQS-S as an innovative tool that aligns with the complex multidisciplinary requirements of health professional education.

The CPQS-S provides valuable insights for placement providers, universities, and students. Placement providers benefit by receiving feedback on site-specific strengths and areas for improvement, enabling them to enhance their placement offerings. For universities, the CPQS-S serves as a data-driven resource to evaluate and improve placement environments. It also acts as a feedback mechanism, guiding professional development efforts for educators and placement sites. For students, the CPQS-S offers a structured, standardized method to reflect on their experiences and identify the factors contributing to placement quality. While clients do not directly engage with the CPQS-SS, the tool's implementation could indirectly benefit them by enhancing the quality of student learning and supervision. Students who are well-prepared and confident in their roles contribute to better client experiences and overall care quality (Suikkala et al., 2021; Zhang et al., 2022). Additionally, positive interactions with engaged and well-supervised students can enhance the client experience (Suikkala et al., 2021; A. Wright et al., 2018).

There are several strengths of this study. The comprehensive psychometric validation based on a substantial sample size encompassed a broad range of disciplines. Employing both development and validation samples enhanced the reliability of the findings, while the application of established statistical criteria and Rasch analysis methodology further supported the robustness of the results. Additionally, data collection occurred over a one-year period to minimize the potential impact of placement timing on perceptions. Limitations should be considered when contextualizing this work. There is potential for response bias due to the self-reported nature of the CPQS-S. Whilst the disproportionate representation of the physiotherapy student cohort is present, it was addressed through weighted analyses. Finaly, the deidentified nature of data collection may have meant some students' perspectives could be represented more frequently if they completed the CPQS-S after each placement experience.

The current data set included students enrolled in health programs from clinical exercise physiology, exercise science, nutrition and dietetics, occupational therapy, physiotherapy, rehabilitation counselling, social work and speech pathology. Further to this, the researchers are aware of the CPQS-S being utilized by placement providers and university programs from the aforementioned disciplines in addition to students enrolled in oral health, prosthetics and orthotics. It suggests that the CPQS-S is widely utilized by a broad range of health disciplines.

Future research could therefore focus on the stakeholders, methodology and implementation of the CPQS-S. The inclusion of a broader range of health disciplines, such as podiatry, radiography, and paramedicine could progress the implementation of the CPQS-S. Additionally, exploring the tool's applicability in international contexts would expand its reach and relevance. There is an opportunity to explore qualitative methodologies that complement the CPQS-S psychometric properties by linking insights from the open-response questions. Longitudinal study designs could track changes in placement quality and student outcomes over time, further enhancing utility. Similarly, there may be an opportunity to triangulate information from tools such as the CPQS-E which gather the educator perspectives (Hargreaves et al., 2024). Finally, developing professional development resources for placement providers and university staff would facilitate the effective application of CPQS-S data to promote a comprehensive approach to quality improvement.

## CONCLUSION

The CPQS-S demonstrates strong psychometric properties, confirming its suitability as a standardized tool for assessing placement quality across a wide range of disciplines. The current study provides new

evidence that the CPQS-S captures a single underlying construct of placement quality perception, reliability differentiating level of quality across diverse placement settings. Having a validated CPQS-S tool enables data-driven approaches to enhance the quality of clinical education and prepare graduates to effectively contribute to the healthcare workforce. By supporting students, universities, placement providers, and educators, the CPQS-S promotes high-quality placement experiences that ultimately reinforce professional standards and competencies. Through consistent assessment across disciplines the CPQS-S can foster shared understanding of placement quality, supporting interprofessional collaboration and alignment with healthcare standards. This adaptability ensures that the CPQS-S remains responsive to the evolving landscape of health professional education, with potential downstream benefits for client care quality through well prepared competent healthcare graduates.

## ACKNOWLEDGEMENTS

We would like to acknowledge the data curation from Jacqueline Broadbridge, Amanda Love and Elisa Canetti and all placement support officers. There was no funding associated with this body of work. The authors report there are no competing interests to declare. Data may be available on request from for researchers who meet the criteria to gain access to confidential data.

## REFERENCES

Ahern, C., & O'Donnell, M. (2022). Are physiotherapy student-led services a suitable model of clinical education? – perceptions & experiences of physiotherapists, students & patients, a qualitative meta-synthesis. *Physiotherapy Theory and Practice*, *39*(5), 963-978. https://doi.org/10.1080/09593985.2022.2031362

AHPRA Accreditation Committee. (2023). *Information paper – Good practice approaches to embedding clinical placements, pedagogical innovations and evidence-based technological advances in health practitioner education*.

Andrich, D., & Maraiss, I. (2019). *A course in Rasch measurement theory*. Springer Nature.

Australian Institute of Health and Welfare. (2024). *Health workforce*. Australian Government. https://www.aihw.gov.au/reports/workforce/health-workforce

Bell, A., Borges Dario, A., Klinner, C., Nisbet, G., Penman, M., Storer, D., & Monrouxe, L. (2024). Improving the quality of allied health placements: student, educator and organisational preparedness. *Studies in Continuing Education*, *47*(1), 337-359.. https://doi.org/10.1080/0158037x.2024.2360495

Bond, T., & Fox, C. (2015). *Applying the Rasch model: Fundamental measurement in the human sciences* (3rd ed.). Routledge. https://doi.org/10.4324/9781315814698

Greenlees, N. T., Pit, S. W., Ross, L. J., McCormack, J. J., Mitchell, L. J., & Williams, L. T. (2021). A novel blended placement model improves dietitian students' work-readiness and wellbeing and has a positive impact on rural communities: A qualitative study. *BMC Medical Education*, *21*(1), Article 387. https://doi.org/10.1186/s12909-021-02756-y

Hamiduzzaman, M., Miles, S., Crook, S., Grove, L., Hewitt, J., Barraclough, F., Hawkins, P., Campbell, E., Buster, N., Thomson, K., Williams, C., & Flood, V. (2024). An integrative review of the impact of allied health student placements on current staff's knowledge and procedural skills in acute and primary care settings. *BMC Medical Education*, *24*(1), Article 657. https://doi.org/10.1186/s12909-024-05632-7

Hamilton, S. J., Briggs, L., Peterson, E. E., Slattery, M., & O'Donovan, A. (2022). Supporting conscious competency: Validation of the Generic Supervision Assessment Tool (GSAT). *Psychology and Psychotherapy*, *95*(1), 113-136. https://doi.org/10.1111/papt.12369

Hams, A., Bell, N., & Jones, T. (2022). Evaluating the impact of a regional student-led physiotherapy clinic model to improve self-reported function in community-dwelling adults with neurological diagnoses. *Journal of Neurologic Physical Therapy*, *46*(3) 206-212. https://doi.org/10.1097/NPT.0000000000000399

Hargreaves, J., Thomas, P., & Kirwan, G. (2024). Development of the Clinical Placement Quality Survey – Educator (CPQS-E) tool to evaluate the quality of physiotherapy clinical placements. *Australian Journal of Clinical Education*, *13*,(1), 13-34. https://doi.org/https://doi.org/10.53300/001c.94127

Irribarra, D., & Freund, R. (2014). *Wright map: IRT item-person map with ConQuest integration*. https://github.com/david-ti/wrightmap

Jones, T., Kirwan, G. W., Howells, S., & Hams, A. (2022). Clinical Placement Quality Survey–Student (CPQS-S): A tool to evaluate allied health placement quality. *International Journal of Work-Integrated Learning*, *23*(4), 579-593

Linacre, J. M. (2002). Optimizing rating scale category effectiveness. *Journal of Applied Measurement*, *3*(1), 85-106.

Linacre, J. M. (2012). *A user's guide to Winsteps Rasch-model computer programs*. www.winsteps.com

Mair, P., & Hatzinger, R. (2007). Extended Rasch modeling: The eRm package for the application of IRT models in R. *Journal of Statistical Software, 20*, 1-20.

McBride, L. J., Fitzgerald, C., Costello, C., & Perkins, K. (2020). Allied health pre-entry student clinical placement capacity: can it be sustained? *Australian Health Review*, *44*(1) 39-46. https://doi.org/10.1071/AH18088

Ozga, D., Gutysz-Wojnicka, A., Lewandowski, B., & Dobrowolska, B. (2020). The clinical learning environment, supervision and nurse teacher scale (CLES+T): Psychometric properties measured in the context of postgraduate nursing education. *BMC Nursing*, *19*(1), Article 61. https://doi.org/10.1186/s12912-020-00455-5

Papastavrou, E., Dimitriadou, M., Tsangari, H., & Andreou, C. (2016). Nursing students' satisfaction of the clinical learning environment: A research study. *BMC Nursing*, *15*, Article 44. https://doi.org/10.1186/s12912-016-0164-4

Penman, M., Raymond, J., Kumar, A., Liang, R. Y. R., Sundar, K., & Thomas, Y. (2023). Allied health professions accreditation standards for work integrated learning: A document analysis. *International Journal Of Environmental Research and Public Health*, *20*(15), Article 6478.

Pigott, A., Patterson, F., Birch, S., Oakley, P., & Doig, E. (2022). The health service impact of an occupational therapy practice placement model: Student-resourced service delivery of groups. *Focus on Health Professional Education: A Multi-Professional Journal*, *23*(2), 21-34. https://doi.org/10.11157/fohpe.v23i2.525

R Core Team. (2023). *R: A language and environment for statistical computing* (Version 4.3.0) [Computer software]. R Foundation for Statistical Computing. https://www.r-project.org/

Rasch, G. (1960). *Studies in mathematical psychology: I. Probabilistic models for some intelligence and attainment tests*. Nielsen & Lydiche.

Robitzsch, A., Kiefer, T., & Wu, M. (2024). *TAM: Test analysis modules* (Version 4.2-21 R package version) [Computer sodtware]. https://CRAN.R-project.org/package=TAM

Rodger, S., Fitzgerald, C., Davila, W., Millar, F., Thomas, Y., Garbutt, K., & Greber, C. (2010). *The improving quality in practice placements (iQIPP) guide* University of Queensland.

Saarikoski, M. (2008). The nurse teacher in clinical practice: Developing the new sub-dimension to the clinical learning environment and supervision (CLES) scale. *International Journal of Nursing Studies*, *45*(8), 1233-1237. https://doi.org/10.1016/j.ijnurstu.2007.07.009

Smith, C., Ferns, S., & Russell, L. (2019). Placement quality has a greater impact on employability than placement structure or duration. *International Journal of Work-Integrated Learning*, *20*(1), 15-29.

Stalmeijer, R. E., Dolmans, D. H., Wolfhagen, I. H., Muijtjens, A. M., & Scherpbier, A. J. (2010). The Maastricht clinical teaching questionnaire (MCTQ) as a valid and reliable instrument for the evaluation of clinical teachers. *Academic Medicine*, *85*(11), 1732-1738. https://doi.org/10.1097/ACM.0b013e3181f554d6

Suikkala, A., Timonen, L., Leino-Kilpi, H., Katajisto, J., & Strandell-Laine, C. (2021). Healthcare student-patient relationship and the quality of the clinical learning environment – A cross-sectional study. *BMC Medical Education*, *21*(1), Article 230. https://doi.org/10.1186/s12909-021-02676-x

Tennant, A., & Conaghan, P. G. (2007). The Rasch measurement model in rheumatology: What is it and why use it? When should it be applied, and what should one look for in a Rasch paper? *Arthritis Care & Research, 57*(8), 1358-1362. https://doi.org/10.1002/art.23108

Universities Australia. (2019). Work integrated learning in universities: Final report. https://universitiesaustralia.edu.au/publication/work-integrated-learning-in-universities/

Victoria Department of Health. (2024). *Implementation of the BPCLE framework: Stakeholder guidelines*. https://www.health.vic.gov.au/education-and-training/best-practice-clinical-learning-environment-bpcle-framework

Wickham, H., Averick, M., Bryan, J., Chang, W., McGowan, L., François, R., Grolemund, G., Hayes, A., Henry, L., Hester, J., Kuhn, M., Pedersen, T., Miller, E., Bache, S., Müller, K., Ooms, J., Robinson, D., Seidel, D., Spinu, V., … Yutani, H. (2019). Welcome to the tidyverse. *Journal of Open Source Software*, *4*(43), Article 1686. https://doi.org/10.21105/joss.01686

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* Article 3. https://doi.org/10.1186/s41077-018-0062-9

Wright, B. D., & Linacre, J. M. (1994). Reasonable mean-square fit values. *Rasch Measurement Transactions*, *8*(3), 370.

Zhang, J., Shields, L., Ma, B., Yin, Y., Wang, J., Zhang, R., & Hui, X. (2022). The clinical learning environment, supervision and future intention to work as a nurse in nursing students: A cross-sectional and descriptive study. *BMC Medical Education*, *22*(1), Article 548. https://doi.org/10.1186/s12909-022-03609-y

APPENDIX A: Summary of placement structures and demographics across health professional education programs.

| Program | Placement Structure and Duration | 2023 Demographics |
|---|---|---|
| Bachelor of Clinical Exercise Physiology | Four-year program: 140 hours (penultimate year) and 360 hours (final year) in two six-week blocks across various pathologies. | 54% aged 20–24; 50.8% female, 1.7% First Nations, 5% international, 10% with a disability. |
| Bachelor of Exercise Science | Three-year program: 140 hours in exercise and sports science contexts. | 31% aged 20–24; 72% female, 5.6% First Nations, 9% international, 13% with a disability. |
| Bachelor of Nutrition and Dietetics and Bachelor of Nutrition and Dietetics (Honours) | Four-year program: 21-week placement in final year, divided into four blocks, with competency-based assessment. | 44% aged 20–24; 82% female, 0.5% First Nations, 9% international, 17% with a disability. |
| Bachelor of Occupational Therapy and Bachelor of Occupational Therapy (Honours) | Four-year program: third- and fourth-year placements included two 10-week blocks. | 46% aged 20–24; 87% female, 2.2% First Nations, 2% international, 14% with a disability. |
| Bachelor and Doctor of Physiotherapy | Four-year Bachelor's or two-year Doctorate program: Five to seven 5-week placements, covering a breadth of clinical areas. | 42% aged 20–24; 50.1% female, 1.5% First Nations, 6% international, 5% with a disability. |
| Master of Rehabilitation Counselling | 1.5-year program: 200 hours of supervised practice in rehabilitation counselling. | 37% aged 30–39; 70% female, 1.1% First Nations, 1% international, 19% with a disability. |
| Bachelor and Master of Social Work | Two 17-week placements (500 hours each) in distinct fields. | 28% aged 20–24; 64% female, 6.5% First Nations, 17% international, 18% with a disability. |
| Master of Speech Pathology | Two-year program: Placements integrated into each trimester, ranging from 4 half-days to 32 days. | 68% aged 20–29; 92% female, 19% international, 8% with a disability |

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

**About the Journal**

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

In this Journal, WIL is defined as:

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

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

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

The Journal is financially supported by the WILNZ, WACE, WIL Australia, and the University of Waikato.

**Types of Manuscripts Sought by the Journal**

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

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

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

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

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

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

**Supporters**

WILNZ Work-Integrated Learning New Zealand Inc
WACE Advancing cooperative and work-integrated education
WIL Australia
The University of Waikato Te Whare Wānanga o Waikato

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



Publisher: Work-Integrated Learning New Zealand (WILNZ)