

Assessing constructs underpinning clinical educator engagement in physiotherapy (Part B): Instrument construction using a modified eDelphi

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Assessing the constructs that impact active engagement of physiotherapists in clinical educator roles could guide initiatives toward sustainability of this workforce. Part B of this series describes the construction of a single purpose-built instrument from items identified in a scoping review (Part A). A multi-professional panel of clinical education experts undertook a modified e-Delphi across three rounds of review: commenting on the relevance of proposed synthesized items (Round one), voting on revised items and demographic questions (Round two), and authentically completing the instrument (Round three). The response rates from 31 participants were 100% (Round one), 97% (Round two) and 87% (Round 3). This study constructed a new instrument consisting of 40 items designed to assess identified factors that underly participation in clinical education by physiotherapists in Australia. Future study is required to apply the instrument to its target population and to evaluate the instrument's psychometric properties.

Keywords: Physiotherapy, clinical educator, Delphi, motivation, survey

Work-integrated learning within the clinical workplace is critical for entry-level physiotherapy students to integrate the skills learned at university into real world practise (Barradell, 2017; Forbes & Ingram, 2019). Situated learning theory has highlighted the profound development occurring in this context as students are formed through the processes of interaction within the socio-cultural structures of the clinical workplace (Fenton-O'Creevy et al., 2015; Wenger-Trayner & Wenger-Trayner, 2015). In this challenging and sometimes uncomfortable transition, the clinical educators' role in facilitating physiotherapy student learning is critical (Patton et al., 2013; Rodger et al., 2011; Siggins Miller, 2012). However, recruitment and retention of clinical educators is challenging. Evaluating the constructs that underpin active participation of physiotherapists in clinical educator roles would potentially guide interventions that enable sustainability of this workforce (Schönwetter et al., 2015; Snook et al., 2021).

In the broader health professional education literature, three person-related constructs that impact active engagement in clinical educator roles have been evaluated through survey-based assessment. (Bartle & Thistlethwaite, 2014; McArthur, 2016; McCullough et al., 2015; Parsons, 2007; van Lankveld et al., 2021). These constructs are (1) educator identity; (2) motivation; and (3) self-efficacy. Each of these constructs is defined by a distinct theoretical framework, and each contributes different approaches to understanding why clinicians may or may not engage in clinical educator roles (Rodgers et al., 2014). Instruments constructed to assess these constructs have been applied in both academic and clinical contexts to assess incentives and barriers to participation in clinical educator roles at specific career

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points or geographical regions (Seo et al., 2018; Verhees et al., 2021), or to assess effectiveness of training programs (Garner et al., 2018; Snook et al., 2019; Wu et al., 2020; Yoshida et al., 2020).

Preliminary work (see paper Part A in this paper series) identified 58 existing instruments that have been developed to assess one or more of these constructs across healthcare professions (Hargreaves et al., 2025). Of these, 16 instruments were appraised as 'sufficient' using COSMIN Criteria for good measurement properties (Mokkink et al., 2018; Prinsen et al., 2018). However, this scoping review found no instrument currently available that assesses all three constructs in clinical educators. Furthermore, no instruments were identified that could be directly applied to the physiotherapy workforce in Australia. The need for a new instrument that enables assessment of all three constructs as well as operational factors, and that is valid for the Australian physiotherapy context, was therefore identified. In order to generate an item pool for constructing this purpose-built instrument, the 16 instruments were further considered in terms of alignment with theoretical underpinnings of the constructs assessed. This discussion identified eight instruments to contribute to an item pool, namely: items from Starr et al. (2006) and Snook et al. (2019) to assess educator identity; items from either Adarkwah et al. (2019) or May et al. (2012), and either Dybowski et al. (2015) or Engbers et al. (2015) to assess motivation; and items from Dybowski et al. (2016) and McArthur (2016) to assess self-efficacy.

This paper outlines an approach to constructing a single instrument that enables assessment of the four constructs of educator identity, motivation, self-efficacy and operational factors on clinical educator engagement in the Australian physiotherapy workforce. The instrument was constructed using the steps identified by Boateng et al. (2018) namely defining constructs, generating potential items, and establishing content validity. The constructs and the potential items were defined in the processes outlined in scoping review (Paper A of this paper series; Hargreaves et al., 2025). However, the 16 studies identified in the scoping review that met the criteria for good measurement properties did not detail a process of expert engagement in constructing an instrument. Consequently, to develop an instrument with content validity, a Delphi process was adopted to systematically evaluate and revise the proposed items. The Delphi process was chosen as it provides a means of ensuring content validity is achieved during instrument construction. Content validity is achieved through consensus of a panel of experts who are potential users of the instrument and are knowledgeable in the construct(s) of interest (Avella, 2016; DeVellis & Thorpe, 2022; Niederberger & Spranger, 2020; Turnbull et al., 2018). The panel ensures that the target population's conceptualization of the constructs is represented, that all essential items are included, and non-relevant items are eliminated (McPhail, 2007; Polit & Beck, 2006). This approach has been identified as a methodologically rigorous approach for reaching consensus on a complex topic (Broder et al., 2022).

Specifically, a modified Delphi process was adopted. A modified Delphi provides summarized literature to participants as a mechanism to provide a uniform context for engagement before gathering responses to a fixed set of questions rather than unstructured opinions (Brauer et al., 2022; Jepsen et al., 2023). The modified Delphi can also be conducted in an online format: allowing experts to engage in their own time and location, without the biases that can occur through in-person discussions (Broder et al., 2022; Eubank et al., 2016; Msibi et al., 2018). The modified e-Delphi approach, therefore, offers a valuable method for constructing a new instrument, using the instruments identified in the prior scoping review (Artino et al., 2014; Gehlbach et al., 2010).

METHODS

Study Design

The study consisted of a three-round modified e-Delphi using an online format, followed by survey pre-testing (Turnbull et al., 2018). Ethical approval was attained from the Metro North HREC (HREC/2022/MNHA/87213) and the University of Queensland HREC (2022/HE001829).

Delphi Process

An expert participant panel was convened to gain consensus in the construction of the new instrument. Experts were defined as: (i) content experts who provide clinical educator professional development and training (e.g., university clinical education workshop providers) including non-physiotherapists; (ii) university program providers in physiotherapy and other healthcare professions; (iii) physiotherapy clinical educators from the Australian physiotherapy workforce (public and private sectors), with expertise demonstrated through identified roles in operational management of clinical education, years of experience in clinical education, and/or involvement in state-wide clinical education networks; and (iv) Directors of Physiotherapy Services who provide clinical placements. Panel members were invited to complete all rounds to ensure optimal representation of opinions and to avoid false consensus (Boel et al., 2021). Participants were purposefully sampled to represent all stakeholders, to capture relevant expertise and ensure cognitive diversity (Doneski, 2017; Niederberger & Spranger, 2020). Participants were identified through professional contacts of known health service networks, existing relationships with university programs, and experts identified through the literature review. Forty-four potential participants were invited, with a minimum of 30 members required for adequate stakeholder representation (McPherson et al., 2018). Data was de-identified by using an allocated participant number.

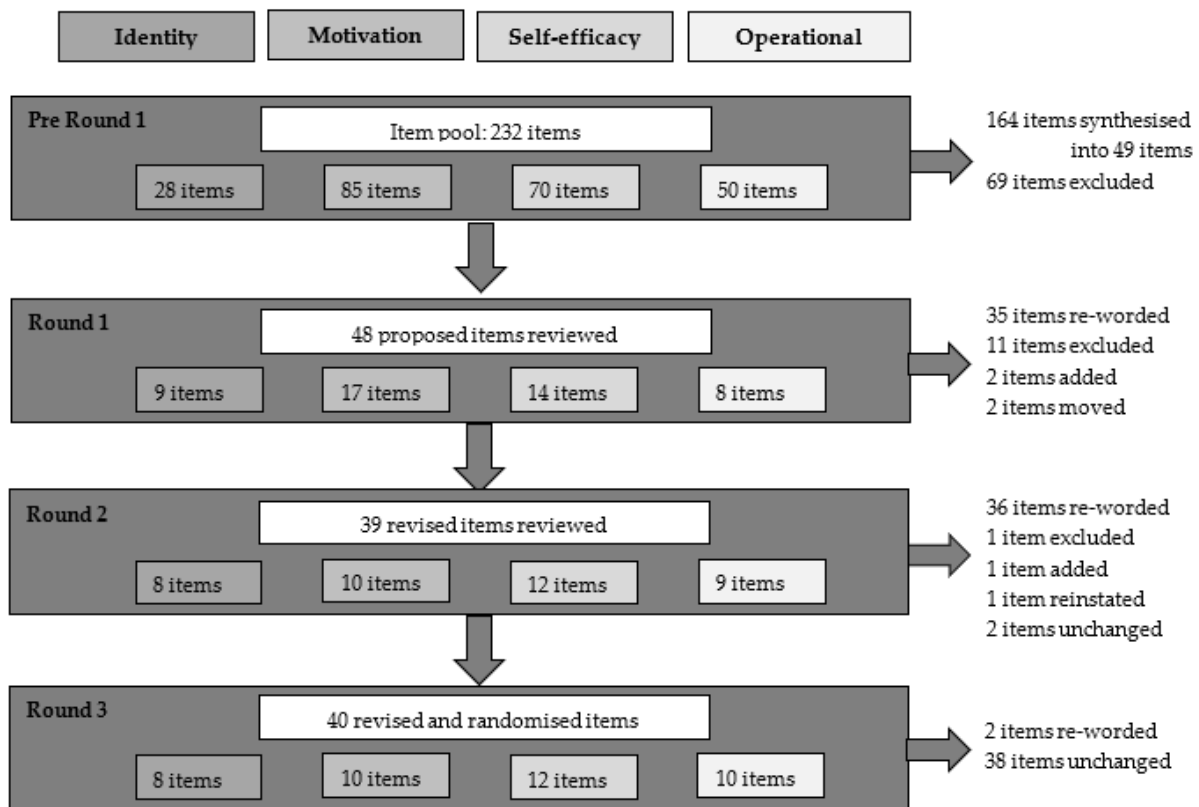
Preparation for Round 1

A preliminary item pool was generated using the eight instruments identified in the scoping review that both achieved 'sufficient' on assessment of measurement quality and aligned with the theoretical frameworks used in this study (Hargreaves et al., 2025). Following the scoping review recommendations to incorporate assessment of operational factors, a ninth instrument was included that assessed operational factors in physiotherapists using a similar survey study design, by Hall et al. (2015). Operational factors were defined as 'organizational structures and characteristics that impact participation in clinical educator roles.' Together these instruments yielded a pool of 232 items. As the intended instrument length was 40 items (10 items for each of the four constructs), this pool exceeded the required number of items of two to five times the intended length (Boateng et al., 2018; DeVellis & Thorpe, 2022).

In order to avoid survey fatigue and lessen the burden on the expert panel, the project team synthesized the initial item pool to form the stimulus material for Round 1 (Figure 1). Conceptualizations of constructs presented in existing instruments were used as the starting point for item generation as cognitive interviews had been undertaken with health professional educators in the development of the existing scales. The item synthesis process involved removing duplicates, synthesizing items that captured a similar concept, rewording items to the Australian physiotherapy context, and excluding items deemed not relevant to the instrument's intent. Complex items were avoided, and language familiar to the expert panel was applied (Artino et al., 2014; Tsang et al., 2017). In addition, theoretical frameworks were used to guide the development of proposed items in each construct. In particular,

items assessing motivation used wording that aligned with the types of motivation described in Self Determination Theory (SDT), namely intrinsic motivation, extrinsic motivation, and amotivation (Deci & Ryan, 1985, 2008; Dybowski & Harendza, 2015; Ryan & Deci, 2000a). For example, items assessing intrinsic motivation used wording to assess actions that are non-instrumental in nature and arise from pure enjoyment, for example, "I enjoy ...". Items assessing amotivation used wording indicating the absence of motivation, for example, "I don't want to ...". For assessment of educator self-efficacy, Bandura's guidelines for scales measuring self-efficacy were used. These guidelines recommend using the language of 'can do' to capture perceived capability, therefore the item stem "I can ..." and "I am able to ..." was used (Bandura, 2006; Dybowski et al., 2016; McArthur, 2016). Additionally, to differentiate between high and low self-efficacy, gradation of challenge to successful performance and difficult situations specific to the context in question were assessed (Bandura, 2006). Items were phrased "Even if ..." followed by a challenging situation/task typically faced by physiotherapy clinical educators (e.g., time pressure) (Dybowski et al., 2016). Item content for typical situations were based upon Gibson et al.'s (2019) systematic review of the skills and qualities for effective clinical educators in allied health. Perceived competence was distinguished from self-efficacy as these constructs are conceptualized within two different theoretical frameworks (Rodgers et al., 2014). Through this process, 48 items were proposed for review by the Delphi panel across the four constructs, namely: identity (9 items), motivation (17 items), self-efficacy (9 items), and operational factors (14 items) (Figure 1).

FIGURE 1: Flow diagram illustrating the three rounds of the eDelphi study.



A consistent scale was sought for all items within the instrument to allow for randomization of items and scoring purposes. A Likert scale was selected as a pragmatic technique to produce numeric data from quantitative estimates of self-reported subjective traits (Jebb et al., 2021; South et al., 2022). A consistent scale was sought across all constructs to enable comparison of means. As the instrument includes assessment of self-efficacy which requires a unipolar scale, the numeric labels on the scale indicate unipolarity (Jebb et al., 2021). To enable a uniform of scale, a unipolar numeric scale was therefore used but with verbal labels which implied bipolarity for usability, with anchors of 'strongly disagree' to 'strongly agree' (Tay & Jebb, 2018). Numeric labels were excluded, and a midpoint was provided to allow for a truly neutral stance to be expressed (Hill et al., 2022; Weijters et al., 2010). A scale of seven-points was initially proposed to ensure stable participant responses (Lozano et al., 2008).

Demographic questions were constructed to enable comparison between groups, and because motivation and self-efficacy are context dependent constructs (Dybowski et al., 2017; Steinert & Macdonald, 2015). In particular, experience as a clinical educator is anticipated to impact mastery experiences, which is posited to correlate positively with self-efficacy as an educator (Bandura, 1997; Dybowski et al., 2016). Demographic questions were placed at the end of the instrument (Gehlbach & Artino, 2018; Hill et al., 2022).

Round 1

Purposive sampling was used to identify potential participants with relevant expertise, while ensuring a heterogenous panel composition that provides cognitive diversity (Niederberger & Spranger, 2020). A total of 44 potential participants were invited via email to participate in the e-Delphi process. Thirty

participants consented prior to Round 1, and one additional participant joined in round 2 (Table 1). As the target sample was achieved in Round 1 no further participants were sought.

TABLE 1: Delphi participation by round.

Round	Sample (n)	No of responses/n	Retention rate (%)
Round 1	30	30/30	100
Round 2	31*	30/31	97
Round 3	31	27/31	87

* Additional participant joined post Round 1.

Approximately one third of participants represented the target population of the instrument as experienced CEs (35.5%). A further one third (35.5%) represented university partners or clinical educator trainers within physiotherapy. The final third comprised clinical education content experts from non-physiotherapy allied health disciplines (12.9%), directors of physiotherapy services from within the public health service (12.9%), and private practise physiotherapy clinical educators/managers (6.5%) (Table 2).

TABLE 2: Delphi participants by expertise.

Participant group	n (%)
Individuals involved in CE training: physiotherapy	4 (12.9)
Individuals involved in CE training: non-physiotherapy	4 (12.9)
University partners (e.g. placement coordinators)	7 (22.6)
Australian physiotherapists and CEs within public health service	11 (35.5)
Private practise Physiotherapy clinical educators/managers	2 (6.5)
Directors of Physiotherapy Services (public health service)	4 (12.9)
Total	31*

*One participant classified in more than one category.

In Round 1, participants were provided with stimulus material comprising definitions of the four constructs, the 48 proposed items, and details of the synthesis process including the full original item pool. Participants were invited to review the proposed items in an Excel® document, and to provide comment in terms of: (i) relevance to the study question to the Australian physiotherapy context, (ii) accuracy of item synthesis, and (iii) any aspects of constructs that were not adequately represented by the existing items (Artino et al., 2014). Participants could recommend nil changes to the item, suggest re-wording including clarification of construct conceptualization, recommend exclusion of the item, and/or recommend new items. All rounds were open for two weeks, with a prompting email sent to non-responding participants in the final week.

Thirty out of 44 invited participants responded in Round 1 (Table 1). As responses were provided in a free-text format, an inductive thematic approach was used for data analysis including description of themes and collated recommendations for re-wording (Braun & Clarke, 2019; Vears & Gillam, 2022). For each item, participant responses were coded as either 'retain without changes,' 'revision/re-wording required,' or 'recommended to exclude.' Missing responses were excluded to ensure that reported percentage agreement or disagreement for each item represented the consensus among only those who responded (Vogel et al., 2019). Items were revised based on the qualitative responses. At the conclusion of Round 1, eleven items were excluded based on combined consensus vote and qualitative responses. Consensus was defined a priori as 70% agreement between panel members (Roberts & Cooper, 2020; Vernon, 2013). Two new items were added and two items were moved to different construct domains

based on alignment with underpinning theoretical frameworks (Figure 1). All remaining items were re-worded to ensure (i) alignment of items to the overall aim of the project (e.g. student perception of educator performance was out of scope); (ii) alignment with the intent of that item (i.e. to reflect the concept underlying the original items synthesized); (iii) clarification of terms used; and (iv) consistent terminology throughout the instrument.

Round 2

Participants were provided with stimulus material for Round 2 through email correspondence. Stimulus comprised a summary of the items retained, re-worded or excluded following Round 1. This material included details of consensus agreement for each item and a rationale for changes made. Participants were invited to review the revised items in an Excel® document and to vote on whether that item should be retained (Yes/No). Further comment could also be provided, e.g. suggested further revision. In addition, the participants were presented with and asked to comment on: the rating scale for each item, an introduction section to the instrument including definition of the term 'clinical educator,' and demographic questions.

Thirty panel members responded in Round 2. Percentage agreement was calculated for Yes/No vote questions using Excel®. An inductive thematic approach was applied to guide revision of items. All construct items that reached consensus ($\geq 70\%$ "Yes" vote) were retained, with minor revisions made based on suggested rewording. Following this process, one item was excluded across the four constructs based on consensus vote, and two new items added based on qualitative response recommendations. One item remained unchanged, with all other remaining items re-worded. Phrasing of self-efficacy items were revised to clarify assessment of self-efficacy rather than perceived competence. Across the instrument, terminology specific to the physiotherapy context was applied for clarity and context-specific validity. For example, the term 'entry-level' was used instead of 'pre-registration,' and 'clinical educator' was used rather than 'practice educator' (Physiotherapy Board of Australia and Physiotherapy Board of New Zealand, 2015). No changes were made to the proposed response scale. It was noted that four items represented a negative response and required negative scoring (m7 - m10).

Round 3

In Round 3, a summary of Round 2 analysis and an anticipated final instrument were provided to participants as stimulus. In this version, construct items were randomised using a random number generator sequence to increase the discriminative ability and reduce potential order effects (Dybowski & Harendza, 2015). Participants were invited to authentically complete the instrument to assess for usability of the instrument (Harris et al., 2009). An online format on the Research Electronic Data Capture software program (REDCap™) was used. In addition, participants could provide further comment, and were asked to comment on potential application of the instrument in their context.

Twenty-seven panelists participated in Round 3, with three non-responders and one member self-excused. As comments were provided in free text format, responses were analyzed using an inductive thematic approach and used to guide final changes to the instrument items (Braun & Clarke, 2019; Kyngäs, 2020; Vears & Gillam, 2022).

By the conclusion of Round 3, no further construct items were added or excluded. Two construct items required re-wording, with 38 items unchanged. The instructions section was re-worded to orientate target participants to the benefits of participation and the sections of the instrument, and to indicate the target population sought. A 'not applicable' response option was added to the item rating scale to allow

for broader application of the instrument (e.g. including academics and physiotherapists in non-clinical roles), and rating scale response options revised down from seven to five points. Four demographics questions were reworded to increase clarity (Q3, 5, 7, and 11). Two questions were re-worded to align with profession-specific terminology (Q2 and Q7), and one new question was added to capture recency of practise as a clinical educator aligned with changes made in the introduction (Q12).

Pre-testing of Instrument

The instrument was pre-tested to evaluate instrument face validity. Pre-testing participants were not involved in the Delphi rounds but represented the target population (Taherdoost, 2016). A convenience sample was selected to represent both a range of clinical areas of practise and clinical educator experience. Participants were invited through email to complete the survey online, with completion of the instrument indicating consent for participation. Ten physiotherapist clinical educators from a metropolitan teaching hospital in Australia completed pre-testing. Participants had facilitated a range of six to fifty clinical placements (Table 3), and represented five areas of clinical practise (Table 4). Nine participants had completed non-accredited training in clinical education, and one participant had completed accredited training.

TABLE 3: Pre-test participants' experience in clinical educator role.

Experience	Mean (SD)	Min	Max
No. of years clinical experience	12 (5)	6	23
Recency: No. of years since last CE role	6 (5)	1	15
Approx. No. of entry-level student placements provided	17 (5)	6	50

TABLE 4: Pre-test participants' area of clinical practise and clinical educator training completed.

Participant demographic		n
Area of clinical practise	Cardiorespiratory	5
	Musculoskeletal	2
	Paediatrics	1
	Women's and men's health	1
	Other (please describe)	3
Level of training in clinical education	None	0
	Non-accredited training (e.g. university workshop, online resources)	9
	Accredited training (e.g. Graduate diploma)	1

Participants completed the instrument under field conditions, and additionally completed an evaluative survey of six 'yes/no' items to comment on the clarity, format, content relevance, usability, and suitability of the instrument (Desai & Patel, 2020; Tsang et al., 2017). After completing the pre-test survey, participants provided verbal feedback through informal interviews with the principal investigator where clarification was required. Based on pre-testing, minor wording changes were suggested and applied to demographic items.

RESULTS

Consensus on 40 items was achieved after two rounds, with 70% or more of the panel voting 'Yes' to retain these items with additional recommendations for re-wording. The final set of construct items is provided in Table 5. Eight of these items achieved 100% agreement.

TABLE 5: Finalized items emerging from Round 2 consensus adopting Round 3 revisions.

No.	Item (final wording per Round 3)	% agreement in Round 2 (n)	
Identity			
id1	Being a clinical educator is an important part of who I am as a health professional.	73.3	(22/30)
id2	Being an effective clinical educator is an important part of my professional identity.	90.0	(27/30)
id3	My experience as a student influenced my decision to be a clinical educator.	90.0	(27/30)
id4	I actively seek opportunities to participate in a clinical educator role.	100	(30/30)
id5	I actively seek opportunities to engage in professional development in clinical education.	93.3	(28/30)
id6	I actively seek opportunities to engage in discussion with colleagues about clinical education.	86.2	(25/29)
id7	I feel that I belong to a community of clinical educators.	86.7	(26/30)
id8	If I ceased being a clinical educator I would miss it.	96.7	(29/30)
Motivation			
m1	I participate in clinical education because I enjoy it.	96.7	(29/30)
m2	I participate in clinical education because I find it personally rewarding.	96.7	(29/30)
m3	I participate in clinical education because it improves my own practice.	96.7	(29/30)
m4	Being a clinical educator provides me with opportunities to build professional networks (e.g. with university, colleagues).	96.7	(29/30)
m5	It is my professional responsibility to pass on my knowledge and skills to students.	90.0	(27/30)
m6	I would feel guilty if I didn't participate in clinical education.	73.3	(22/30)
m7	I participate in clinical education because of the benefits I receive (e.g. financial remuneration, academic title, access to university resources).	n/a: added in Round 2	
m8	Being a clinical educator advances my career.	93.3	(28/30)
m9	I participate in clinical education because it is an obligation of my job.	76.7	(23/30)
m10	I would rather not be a clinical educator.	82.8	(24/29)
Self-efficacy			
se1	I am confident that I can apply effective teaching skills as a clinical educator.	100	(30/30)
se2	I am confident that I can be a role model to students.	96.7	(29/30)
se3	I am confident that I can identify the learning needs of students.	100	(30/30)
se4	I am confident that I can align learning strategies with each student's needs.	93.3	(28/30)
se5	I am confident that I can effectively engage in the student feedback process.	90.0	(27/30)
se6	Even when I feel overwhelmed I can fulfil the clinical educator role.	86.7	(26/30)
se7	Even when I am under time pressure I can provide effective clinical education.	80.0	(24/30)
se8	Even when students ask challenging questions I can respond effectively.	90.0	(27/30)
se9	Even when students experience issues impacting their wellbeing I can appropriately support them.	86.7	(26/30)
se10	Even when students are experiencing learning challenges I can effectively foster their learning.	86.7	(26/30)
se11	I am confident that I can evaluate a student's performance accurately.	100	(30/30)
se12	I am confident that I can implement innovative clinical education strategies.	82.8	(24/29)
Operational factors			
op1	The clinical presentations in my workplace are appropriate for student learning.	80.0	(24/30)
op2	There is sufficient time in my role to support student learning.	86.2	(25/29)
op3	I feel supported by my employer in the clinical educator role.	100	(30/30)
op4	I feel supported by my colleagues in the clinical educator role.	100	(30/30)
op5	I feel supported by the universities in the clinical educator role.	n/a: added in Round 2	
op6	The clinical educator role is appropriately acknowledged within my workplace.	100	(30/30)
op7	I have access to appropriate physical resources in my workplace to provide clinical education (e.g. space, technology, teaching tools).	90.0	(27/30)
op8	I have access to appropriate training as a clinical educator.	93.3	(28/30)
op9	Providing clinical education impacts positively on the overall productivity of my workplace.	86.2	(25/29)
op10	My patients/clients receive benefit from my participation in clinical education.	100	(29/29)

Based on a combined analysis of quantitative and qualitative responses for each item, eleven items were excluded in Round 1 and one further item excluded in Round 2 (Table 6). Reasons for exclusion included: not meeting consensus (n=6), overlap with existing items (n=4), or not being relevant to the target context or population (n=2). Following the same analysis process, three new items were added across Round 1 and Round 2, one item reinstated in Round 2, and two items were moved between constructs in Round 1. The final set of demographic questions are provided in Appendix A (Table 7).

TABLE 6: Items added, reinstated, excluded or moved across Delphi rounds.

Item	Construct	Change to item	Round	% agreement (n)		Rationale
I am an effective educator for students in my clinical area.	identity	excluded	1	56.7	(17/30)	Agreement >70%
I enjoy sharing ideas about clinical education.	identity	excluded	1	83.3	(25/30)	Overlap with existing items - synthesized
My experience as a student influenced my decision to be a clinical educator.	identity	moved from motivation	1	76.7	(23/30)	Agreement >70%
I find satisfaction in being a clinical educator.	motivation	excluded	1	86.7	(26/30)	Overlap with existing items - synthesized
I believe it's a physiotherapist's duty to pass on their knowledge.	motivation	excluded	1	50.0	(15/30)	Agreement >70%
I educate because otherwise I would feel guilty towards my supervisors.	motivation	excluded	1	50.0	(15/30)	Agreement >70%
I am adequately financially compensated for my time spent supervising students.	motivation	excluded	1	83.3	(25/30)	Not relevant in target context
I educate although it is rather irrelevant to me in comparison to my other occupational activities.	motivation	excluded	1	63.3	(19/30)	Agreement >70%
I am not interested in instructing physiotherapy students.	motivation	excluded	1	60.0	(18/30)	Agreement >70%
Being a clinical educator provides me with opportunities to build professional networks (e.g. with university, colleagues).	motivation	added	1	n/a		Combined qualitative responses
I am a clinical educator because it enhances my professional status.	motivation	excluded	2	86.7	(26/30)	Overlap with existing items - synthesized
I participate in clinical education because of the benefits I receive (e.g. financial remuneration, academic title, access to university resources).	motivation	reinstated	2	83.3	(25/30)	Agreement >70%
I provide good clinical education even when I am assigned to students at short notice.	self-efficacy	excluded	1	63.3	(19/30)	Agreement >70%
I provide good clinical education even in difficult clinical situations.	self-efficacy	excluded	1	73.3	(22/30)	Overlap with existing items - synthesized
Supervising students assists with recruitment of new staff members.	operational	excluded	1	80.0	(24/30)	Not relevant to target population
The clinical educator role is appropriately acknowledged within my workplace	operational	moved from motivation	1	76.7	(23/30)	Agreement >70%
I have access to appropriate training as a clinical educator	operational	added	1	n/a		Combined qualitative responses
I feel supported by the universities in the clinical educator role.	operational	added	2	n/a		Combined qualitative responses

DISCUSSION

This study describes the construction of a single purpose-built instrument to enable assessment of constructs that impact physiotherapists' engagement in clinical educator roles in the Australian context. A preliminary scoping review (Part A) formed the necessary basis to generate an item pool to construct this instrument. A modified e-Delphi process was used to develop the new instrument with content validity. The instrument consists of 40 randomized items that assess the four constructs of educator identity, motivation, self-efficacy and operational factors. These items are presented as statements which are rated using a five-point Likert scale, with a sixth 'not applicable' option. This item set uniquely offers the potential to assess all four constructs within a single instrument (Hargreaves et al., 2025). In addition, 13 demographic questions were constructed to enable analysis of the constructs in relation to clinical and education experience, clinical and geographical setting, and training completed. Demographic questions were aligned with categories and terminology specific to the Australian physiotherapy context.

Content validity of the instrument for the Australian physiotherapy context was achieved through a modified e-Delphi process. This method established both content relevance ('do the items capture the relevant experience of the target population?'), and representativeness ('have any important items that assess the phenomena of interest been omitted, and are items that are outside the conceptual definition excluded?') (McPhail, 2007; Polit & Beck, 2006). As panel members were asked to vote on item inclusion as well as provide comment on items, these quantitative and qualitative responses were combined to guide item re-wording and further synthesis, rather than using a statistical analysis such as the content validity index (CVI) (Cochran Ward et al., 2013; Wynd et al., 2003).

Several items generated dissensus due to ambiguity of content either within the item, in relation to similar items, or in relation to the intent of the item. In response, these items were excluded, re-worded for clarification, or synthesized with retained items. For example, within the motivation construct the sense of obligation or duty driving participation in clinical education was clarified in the two simplified items describing guilt (m8) or obligation (m9), without reference to an interpersonal direction (e.g. guilt toward a supervisor/ colleague). This language aligns with the existing literature that describes Australian physiotherapists engaging in clinical education out of a sense of duty (Newstead et al., 2023; Sevenhuysen & Haines, 2011). In the construct of self-efficacy, re-wording for clarity sought to both retain the intent of the original item and to align with terminology relevant to the Australian physiotherapy context as self-efficacy is context dependent. For example, the language of feeling overwhelmed was applied to clarify the nature of difficult clinical situations in terms of the perceived stress reported by physiotherapy clinical educators (Hall et al., 2015).

The construct of motivation drew the lowest level of consensus: this was unsurprising given both the large initial pool of motivation items and the breadth of types of motivation. While clinical education models vary across Australian physiotherapy, supervision of students may be voluntary or may be an expectation of their role description (McMeeken, 2008). Overlapping concepts were therefore reworded to ensure content representation across the three types of motivation. Of these, *intrinsic motivation* gives rise to actions which are done out of pure enjoyment or interest and are non-instrumental in nature (item m1) (Ryan & Deci, 2000b). In contrast, *extrinsic motivation* drives actions that are instrumental in nature. Self-determination theory further categorizes extrinsic motivation according to three levels of self-regulation. First, 'identified regulation' drives participation in activities that are instrumental but have a sense of personal value or meaning: it is personally rewarding (m2), improves practise (m3), and builds networks (m4). Second, 'introjected regulation' is associated with being controlled by internal

pressures such as feelings of guilt or shame (m5 and m6). Third, 'external regulation' drives behaviors that are directed solely to obtain reward or avoid punishment (m7, m8 and m9). Finally, *amotivation*, defined as the absence of motivation, was assessed by the item "I would rather not be a clinical educator" (item m10).

The item assessing perceived benefit (m7) required revision across all three rounds. Financial remuneration as an independent benefit was rejected in Round 1, re-introduced within the concept of 'appropriate reward' in Round 2, and finally revised in Round 3 as one of several potential benefits of engaging in clinical education. This breadth of possible expressions of recognition aligns with the various "currencies of recognition" described across health professional education (Johnston et al., 2022, p. 3). There is significant variability regarding the importance of financial incentive for clinical education across the health professions education literature, with some studies highlighting monetary compensation as a significant motivator (Leitch & Walker, 2000; McCullough et al., 2015a) and others not identifying financial remuneration as a motivating factor at all (Budden et al., 2017; Dybowski & Harendza, 2014; Steinert & Macdonald, 2015). Similarly in physiotherapy, the priority of non-monetary incentives has been highlighted. A survey of physiotherapists in the USA indicated that a majority (72%) of academic and clinical stakeholders did not support payment of clinical educators, with preference for non-monetary incentives (Wilkinson et al., 2021). Notably in a study of Australian physiotherapists, financial compensation was not even mentioned amongst the discussion of benefits of being a clinical educator (Newstead et al., 2023). In an era of constrained healthcare budgets, the non-monetary benefits of being a clinical educator which are meaningful to clinical educators requires closer attention (Johnston et al., 2022).

The importance of operational supports for participating in clinical education was reinforced by this study. Research in medical and nursing education indicate that organizational supports alone are not able to explain why clinicians participate and persevere in clinical educator roles, or to adequately retain clinicians in clinical educator roles (Asher-Slimak et al., 2023). However, particularly in the acute care context, organizational structures including support from leadership, recognition by peers, and human resource development have been shown to have a significant impact on engaging clinicians in clinical educator roles (Dybowski & Harendza, 2014; Johnston et al., 2022). In this study, the addition of an item assessing support from universities aligns with recent literature that suggests that Australian physiotherapists perceive a disconnect between the clinical placement experience and university expectations (Hargreaves et al., 2022). Similarly, the recommended item assessing access to appropriate training reinforces the importance of targeted training for clinicians undertaking a clinical educator role (Hargreaves et al., 2022).

The sustainability of the Australian physiotherapy clinical educator workforce is of importance to multiple stakeholders, including universities seeking to ensure employability of graduates and adequate clinical placement opportunities, and employers reliant on a work-ready and sufficient physiotherapy workforce. Initial applications of this instrument are anticipated to include diagnostic assessment of the impacts of these constructs by physiotherapy employers for individual clinicians, and at department-wide and health service-wide levels (Seo et al., 2018; Verhees et al., 2021). Such assessment could guide targeted implementation strategies including the development of tailored training programs, and provide baseline data for evaluation post-implementation (Garner et al., 2018; Wu et al., 2020;).

STRENGTHS AND LIMITATIONS

A strength of this study was the panel of Delphi experts in clinical education across Australia, and across sectors. In addition, a high response and high retention was achieved throughout this study. While a Delphi technique is a recognized approach to establishing content validity, the use of experts may influence which items achieved agreement. This risk was mitigated by including clinicians within the panel as well as content experts to ensure perceptions of the target group were considered, and consequently that items developed reflect the phenomenon and context under study.

An additional step to establishing content validity in instrument construction can include cognitive interviews with the target group. Cognitive interviews are conducted to check that the construct conceptualizations used are shaped not only by the literature but also by the target population in their own words (Artino et al., 2014). While this study opted for a deductive approach to define constructs based on a review of existing instruments within health professions educators, this work could be further strengthened by adding cognitive interviews with the target group (Boateng et al., 2018).

Finally, this instrument was specifically developed for the Australian physiotherapy context. The potential application of this instrument to other healthcare professions and international context may be limited as the expert panel comprised predominantly physiotherapists in Australia. Further work would therefore be required to assess the relevance of items to other healthcare disciplines within Australia, and physiotherapists internationally.

CONCLUSION

This study constructed a robust instrument that is contextualized and is designed to assess the impact of constructs that are anticipated to influence participation in clinical educator roles by Australian physiotherapists. Content validity of the instrument was achieved through a modified e-Delphi process during the instrument's construction. Future research should include administration of the instrument and testing of psychometric properties to establish construct validity and use of the instrument within the target population.

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APPENDIX A

TABLE 7: Demographic questions in instrument.

No.	Question	Response options
1	How many years have you worked as a physiotherapist?	Free text – number required
2	What is your highest level of professional qualification?	Bachelor Bachelor (Hons) Graduate entry-masters Graduate certificate Graduate diploma Coursework masters (e.g. Clinical Postgraduate Masters) Professional doctorate Higher degree by research (Masters) Higher degree by research (PhD)
3	What is the highest level of training have you completed in clinical education?	None Non-accredited training (e.g. university workshop, online resources) Accredited training (e.g. Graduate diploma) Please describe/list the training in clinical education that you have completed
4	Do you currently work full time or part time?	Full time Part time Other (please describe):
5	How would you describe your primary role? (Select all that are relevant)	Clinician Clinical educator Researcher Manager Other (please describe):

6	What is your primary work sector?	Public Private Not-for-profit Other (please describe):
7	What is your primary place of practise?	Hospital – public Hospital – private Private Practice Residential aged care Educational organisation Disability organisation Primary Health and Community Care Other (please describe):
8	What is your primary clinical area?	Cancer care/palliative care Cardiorespiratory Disability Gerontology Management Musculoskeletal Neurology Occupational health Orthopaedics Paediatrics Womens and Mens health Other (please describe):
9	Geographically I classify my workplace as	Metropolitan Regional Rural/remote
10	Please provide the postcode for your primary workplace	
11	Approximately how many entry-level students have you facilitated on clinical placement? Number of years since I last participated in a clinical educator role for entry-level students:	(free text) (If you have never participated in a clinical educator role please enter "0".) (If you been a clinical educator within the last 12 months please enter "0".)
12	Please describe any material benefits you receive through your participation in clinical education (e.g. financial remuneration, academic title, access to university resources).	(free text)
13	Do you have any further comments about reasons why you do/don't engage in clinical education for entry-level physiotherapy students?	(free text)



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, entrepreneurship, student-led enterprise, student consultancies, etc. WIL is related to, and overlaps with, the fields of experiential learning, work-based learning, and vocational education and training.

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

The Journal is financially supported by the Work-Integrated Learning New Zealand (WILNZ; www.wilnz.nz), WACE (www.waceinc.org), WIL Australia (www.acen.edu.au), and the University of Waikato (www.waikato.ac.nz).

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>

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