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Development and initial validation of a questionnaire to improve preparation of pre-service teachers for contemporary inclusive teaching

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Abstract

This paper describes the development and initial validation of a questionnaire designed to inform curriculum and pedagogy to better prepare pre-service teachers for contemporary inclusive teaching. Pre-service, beginning and experienced teachers' views about enhancing the preparation of pre-service teachers during initial teacher training for inclusive teaching were explored in the areas of attitudes, knowledge and skills. The rationale and process underlying the development of the questionnaire are presented. Results of exploratory factor analysis support the questionnaire's construct validity. Results using Cronbach's alpha coefficients showed good to very good internal consistency (alpha's ranging from .79 to .91). Findings arising from the questionnaire provided valuable evidence regarding curriculum and pedagogy to enhance the preparation of pre-service teachers for inclusive teaching. The methods employed in developing the questionnaire are transferable across a range of research settings and disciplines.

Key words: *Questionnaire design; instrument development; psychometric testing; inclusive education; pre-service teachers; teacher education; survey methods.*

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Background

Increasingly, students with diverse learning needs are taking their place in regular classes in regular schools. This approach is referred to as inclusive education and involves the full participation of students with disability in all aspects of regular classes and school settings. Inclusive education celebrates difference and embraces student diversity within regular classroom settings as opposed to segregating students into special classes and schools. It requires schools and teachers to adopt inclusive approaches by catering for the needs of all students (Loreman, Deppeler & Harvey, 2011).

Despite the global trend towards inclusive education, research shows that initial teacher education programs are not adequately preparing pre-service teachers for their role as contemporary inclusive teachers (Kurth & Foley, 2014; Sharma & Sokal, 2015). Pre-service teachers are university students studying to qualify to become a teacher. Importantly, there is a paucity of detail regarding specific skills that pre-service teachers must attain before commencing inclusive teaching (Kurth & Foley, 2014; Parliament of Australia, 2016; Parliament of NSW, 2010). Further, there is insufficient evidence detailing the types of learning experiences that would enhance pre-service teachers' preparedness.

Historically, little guidance has been provided to teacher educators (academics and lecturers) on designing courses that adequately prepare pre-service teachers for inclusive teaching. Documents intended to guide teacher educators in course development of inclusive education lack sufficient detail about curriculum and pedagogy, often leaving inclusive teacher educators to make decisions without an evidence-base or adequate direction. As recently as 2018 in Australia, the New South Wales Education Standards Authority (NESA) nominated "Students with Special Needs" as one of a number of priority areas in which pre-service teachers ought to acquire knowledge and skills. When preparing pre-service teachers for subjects they will teach in schools, teacher educators are guided by the relevant school curricula. However, no such detailed comprehensive curricula are available for subjects such as inclusive education and diversity which are not school subjects. Traditionally, guidelines provided by teacher education authorities offer only general information about effectively preparing pre-service teachers for inclusive teaching.

To address this lack of detailed information, a study was conducted to identify and generate curriculum and pedagogy that could be used to effectively prepare pre-service primary teachers during initial teacher education for inclusive teaching. Existing questionnaires, however, focussed particularly on attitudes and few tools adequately explored the specific skills required for inclusive teaching. This paper details the development of a questionnaire purpose-designed to ascertain the views of pre-service, beginning and experienced teachers about better preparing pre-service teachers for contemporary inclusive teaching. The study findings would then inform and enhance the delivery of initial teacher education programs for contemporary inclusive teaching. This paper describes the development of this study-specific questionnaire. The authors' intention is two-fold. Firstly, we aim to inform readers in this field of research about the questionnaire, its utility and psychometric properties. Secondly, to share with readers who may be considering developing a questionnaire, the steps involved and the rigour employed in creating a useful tool – all of which are transferable across a range of research disciplines.

Method

This research involved a state-wide study conducted in school systems across New South Wales (NSW), predominantly Department of Education (public government schools) with a small representation from non-government schools. As such, it was important to design a survey questionnaire suitable for use in a variety of educational settings with a variety of participants.

The questionnaire needed to serve two purposes. It needed to yield data for comparing pre-service with experienced teachers on their perceptions regarding their general preparedness, and their attitudes, knowledge and skills for inclusive teaching. Further, questionnaire responses would be used to identify content that pre-service and experienced teachers believe should be covered during initial teacher education to prepare pre-service teachers for inclusive teaching. This research also involved the delivery of an inclusive education unit as a study intervention and the questionnaire was used to evaluate changes in self-reported attitudes, knowledge and skills of pre-service teachers after undertaking the unit.

Ethics approval was granted by the university and educations systems where this research was conducted. All participants were informed that participation in the questionnaire was voluntary.

Settings and Participants

In this study pre-service teachers were postgraduate students enrolled in a Master of Teaching program in an initial primary (child ages approximately 5 to 12 years) teacher education course in a NSW (Australia) university. As part of their degree they are required to undertake a mandatory one semester unit in inclusive education to prepare them to cater for the diversity of learners in contemporary classes. The term "Experienced teachers" refers here to primary school personnel predominantly from government schools comprising primary teachers, executive staff (principals and assistant principals), school counsellors and support teachers (e.g., itinerant support teachers, learning and support teachers[1]).

Recognising that participant groups would be completing questionnaires in different settings, the questionnaire was designed for both online and hard-copy presentation. This allowed optimal response rates in each setting (Dillman, Smyth, & Christian, 2014). The questionnaire was disseminated in hard-copy to pre-service teachers attending the first and last lecture of the inclusive unit. The online survey was distributed using online education communities such as Moodle and emails to principals and Department of Education personnel. Experienced teachers were invited to respond to the online version once only.

On piloting the hard-copy version with pre-service teachers, it became apparent that respondents had developed a pattern of responding based on the preceding section's multiple Likert-scale type questions and had continued using this response-pattern when asked to rank items. This was despite written instructions advising how to complete the ranking questions. To avoid the risk of collecting unreliable data during the study, the researcher personally presented instructions demonstrating how to complete the ranking questions. This issue did not arise, however, in the online version used by the experienced teachers, because items were ranked using a 'drag and drop' method on the screen.

[1] School counsellors are qualified teachers with psychology registration; itinerant teachers have postgraduate qualifications in areas of expertise (e.g., hearing); learning and support teachers often have qualifications in inclusive or special education.

Because the questionnaire was intended to gather data from pre-service and experienced teachers and across time points it was necessary to make minor modifications to the wording as appropriate. Care was taken to ensure these modifications did not alter the information of interest, thus allowing statistical comparisons between groups and across time-points. In addition five questions were added to the pre-service teachers' post-unit questionnaire to gather information on pre-service teachers' perspectives about their preparedness for inclusive teaching after completing the inclusive unit. Figure 1 show the steps in designing the questionnaire. This is followed by a more detailed explanation about the design process.

Designing the questionnaire – procedures and results

Two important strategies informed the development of the questionnaire:

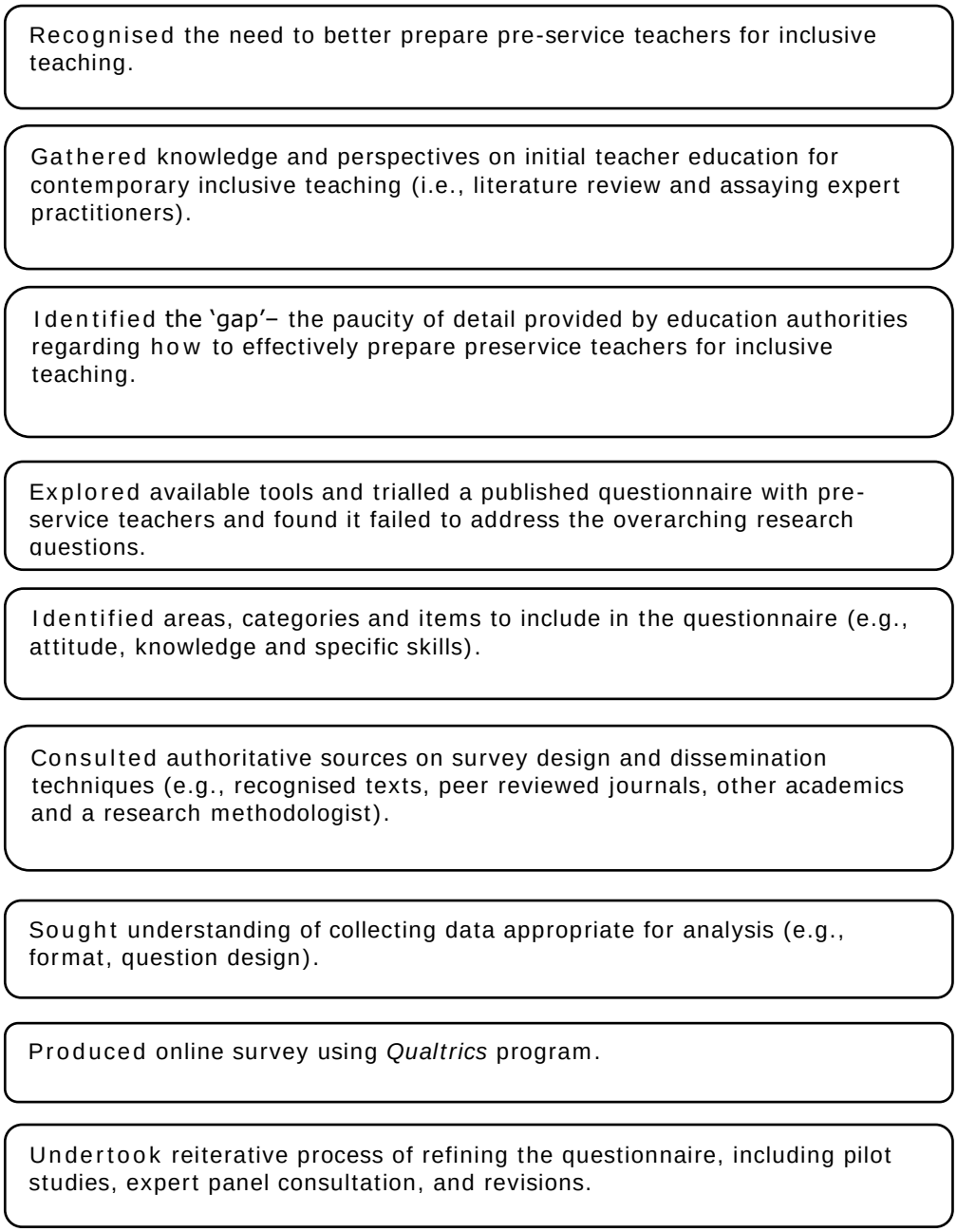
- consulting senior academics in teacher education and a research methodologist regarding content, structure, formatting and statistical aspects of the questionnaire prior to dissemination
- piloting the questionnaire with different groups and individuals (e.g., checking that the '*skip logic*' in the online version directed respondents only to questions relevant to them, careful editing to ensure that instructions and wording were logical and readable).

The design process involved multiple steps and several iterations. The first step was to determine content that would address the research questions.

Determining questionnaire content

A review of the literature revealed key topics about initial teacher education and inclusive education that were incorporated into the questionnaire (Alahbabi, 2009; Harvey, Bauserman, & Merbler, 2010; Hsien, 2007; Hsien et al., 2009; Loreman, 2007, 2010 ; Shaddock, Smyth King, & Giorcelli, 2007). These fell into the areas of attitudes, knowledge and skills and were used to inform the selection of the content of the questionnaire. "Attitude" refers to the acquisition of informed and responsible predispositions about students with disabilities right to be included in regular classes. "Knowledge" refers to concepts and central ideas considered crucial to a subject or discipline (Hayes, Mills, Christie, & Lingard, 2006) and the term "Skill" refers to the ability of teachers to apply effective strategies to include and cater for the needs of students with disabilities in regular classes. Studies showed that certain topics related to skill acquisition (classroom management, collaboration, differentiation and resource use) should be included in curriculum for preparing pre-service teachers for inclusive education (Alahbabi, 2009; Loreman, 2007, 2010b; Shaddock et al., 2007). Figure 2 provides an overview of the questionnaire content. Additional items (e.g., diversity, inclusive classroom management) were included in the questionnaire as based on the researcher's experience (as an academic, consultant, assistant principal and teacher in the field of inclusive and special education) these topics were covered in the inclusive education unit involved in this study.

Figure 1:
Steps in designing the questionnaire



Structuring the questionnaire

The questionnaire was divided into four sections and was designed to obtain the following information:

- Section 1. Demographic information that was considered potentially relevant to participant responses and to help explain variance in group responses. This included information such as age, gender, qualifications, years of experience, personal experience of a person with a disability and general questions to ascertain participants' views about and experience of inclusive education.

Some questions (e.g., school location, teacher role) were tailored to the different participant groups.

- Section 2. General attitudes about including students with diverse learning needs and self-belief about ability to implement inclusive education;
- Section 3. Perceptions about:
  a. importance of specific items and the extent to which they should be covered during initial teacher education to prepare pre-service teachers for inclusive education in the areas of attitudes, knowledge and skills.
  b. ability to perform particular skills (e.g., manage cooperative learning groups, differentiate the curriculum).
- Section 4. General and open-ended responses about the preparation of pre-service teachers for inclusive education (e.g., '*What concerns or comments do you have about initial teacher education to prepare pre-service teachers for inclusive education?*'). A final question allowed participants to provide contact details if they were willing to take part in a follow-up interview.

Section 3 comprised items about Attitudes, Knowledge, and Skills (see Figure 2). The Attitudes and Knowledge areas comprised four items each and were not divided into categories. As an important focus of the study was on improving pre-service teachers' skills the Skills area was more detailed. This area comprised 20 items divided across four categories; Classroom Management, Collaboration, Differentiation and Resource Use. To avoid the possibility of cognitive overload in participants required to rank more than five items, the Differentiation category was further divided into two sub-categories: *skills to cater for a diversity of learners*; and *general practices for inclusive teaching*. Each of the Differentiation sub-categories contained a distractor item. These items are routinely used in questionnaires to check respondents' level of attention to the task – this is further explained under the heading *questionnaire psychometrics.* Likert-scale type questions were used as this format is likely to be familiar to most people and when well-designed the format yields numerical data for statistical analysis that can provide useful information about the sentiments of participants on a specific issue (Burke Johnson & Christensen, 2014). Five-point Likert-scales were used in Section 2 because these questions explored attitude, knowledge and skills at a general level (e.g., In Section 3, however, 7 point Likert-scales were used to explore these areas in greater detail. This section comprised questions with lead-in phrases (i.e., stems such as '*Pre-service teachers should learn how to …*') that related to multiple items. Attention was given to ensuring that stems preceding Likert-scale choices were clear and concise and terms used in the Likert-scale ratings were appropriate to the stems. For example, '*How well can you do the following?* ' – with ratings from '*not at all well'* to '*extremely well'* - for a list of items This is important for promoting participant understanding and increasing data accuracy.

There is debate about placement of the neutral response in Likert-scales. Some researchers argue that placing the neutral option at the end encourages respondents to take a position (Burke Johnson & Christensen, 2014). However, the placement of the neutral response has implications for analysis. It is important to note that responses may need to be recoded for data to yield meaningful results. In this study, for questions about level of agreement (Section 2), the neutral option ('*neither agree nor disagree'*) was placed as the last rather than middle option, which allowed results that reflected the measure of agreement. To avoid reverse coding of responses, it is important to consider analysis and interpretation of results when ordering options on Likert-scale ratings (e.g., ordering level of agreement from low to high).

Care was taken to avoid biased or loaded questions. Language can lead respondents to adopt particular positions or viewpoints (e.g., asking participants about *grappling* with inclusive education can prime biased or emotionally-loaded responses). Throughout the questionnaire, optional open-ended questions were included to allow participants to elaborate or explain their response if they desired; this provided

qualitative data. The questionnaire was produced using the online program *Qualtrics* (https://www.qualtrics.com/au/). This program enables researchers to collect data digitally and to conduct statistical analysis.

Refining the questionnaire

The questionnaire underwent continuous and rigorous review resulting in numerous iterations. Initially the questionnaire was critiqued by five colleagues participating in a research writing group. It was piloted twice: initially with nine pre-service teachers who were in a final tutorial of an inclusive unit (not the intervention involved in this study). Their responses highlighted where some Likert-scale type questions had failed to generate a spread of data. Instead, participants tended to select *important* and *very important* for all items. To address this issue, some Likert-scale questions were rephrased and a section was added in which participants were asked to rank topics from the most important to least important. The ranking format proved an effective strategy that yielded greater discernment in level of importance between topics.

Following these modifications, this iteration of the questionnaire was then trialled with a focus group comprising a different tutorial group of 22 pre-service teachers who did not participate in the study. This group provided verbal and written feedback about the design of the questionnaire. As a result some terminology was changed. The instrument was further refined after consulting with individuals who had knowledge about the topic or who were able to offer other relevant contributions (e.g., academics who work in the field of inclusive education, university students not undertaking the inclusive unit and teacher colleagues of the researcher).

In summary, the following aspects were considered during the construction process to ensure the questionnaire accurately captured the required data:

- Structure and layout – a conceptual chart was created to monitor the distribution and number of questions related to *areas* (i.e., Attitudes, Knowledge, and Skills) and *categories* (Classroom Management, Collaboration, Differentiation and Resource Use) comprising specific *items* (e.g., acquire specific skills such as questioning skills, task analysis); aspects such as advantages of 5- or 7-point scale and the suitability of the visual presentation of the scale were considered; and restructuring side-by-side questions[2] to eliminate the possibility of cognitive overload;
- Suitability and appropriateness of language for pre-service and experienced teachers (e.g., professional terminology illustrated by examples; tense changed to past, present or future; using familiar vocabulary and eliminating possible ambiguity);
- Participant overload (e.g., ascertaining the amount of time it took participants to complete the pilot questionnaire; which was found to be approximately 20 – 40 minutes);
- Different formats used to elicit data that provided further insight about the same items (e.g., using both Likert-scales and ranking formats);
- identifying the need to demonstrate how to complete the ranking on hard-copy questionnaires;
- Tailoring demographic information questions to each group; some questions were modified to allow for the different experiences of the pre-service and experienced teacher groups and the diverse school settings;

[2] Side-by-side questions allow the researcher to collect data on an identical topic from different perspectives (e.g., to what extent do you think…; how well can you do …). Two columns of questions are placed beside each topic.

- The experienced teacher questionnaire had a total of 42 questions (due to additional demographic questions) while pre-service teachers were asked 25 questions. However, in both versions some questions required participants to respond to multiple items (e.g., *a-h*). This avoids asking about multiple concepts within one sentence (e.g. how well can you collaborate with *parents/ guardians* and *teacher assistants/aides*?)

Evaluating questionnaire performance

The integrity and credibility of research findings depends largely on the performance of the tool employed in a study. Several parameters were calculated to evaluate the performance of the questionnaire.

Response rates

The data was cleaned, that is, assessed for missing, illegible, or incomplete answers. Overall, there was minimal missing data. This suggests an acceptable participant load despite the length of the questionnaire and the 20 – 40 minutes estimated for its completion. For the sample of pre-service teachers 235 pre-unit questionnaires and 128 post-unit questionnaires were collected. Pre- and post-unit questionnaires were matched using study identification codes; yielding matched data for 119 pre-service teachers. Response rates for the hard-copy questionnaires were excellent (> 95%) at both time-points (pre-service teachers pre- and post-unit). While unable to calculate a response rate for the online questionnaire, an impressively large number of experienced teachers (n=326) completed it. The hard-copy responses were scanned and the data collected was recorded digitally.

Questionnaire psychometrics – validity and reliability

Validity refers to a tool's capacity to measure what it is intended to measure (Bryman, 2012). This questionnaire was designed to generate responses that answered the overarching research question about identifying curriculum and pedagogy to effectively prepare pre-service teachers for inclusive teaching during initial teacher education. There are several types of validity and the questionnaire was evaluated for a number of these within the context of its intended purpose.

Face validity concerns the superficial appearance or face value of a measure. That is, the tool looks like it measures the intended construct (Burke Johnson & Christensen, 2014). Face validity of the questionnaire was confirmed using the widely-accepted method of having it critiqued by individuals who are experts in the field of its intended use.

Figure 2:
Designing the Questionnaire

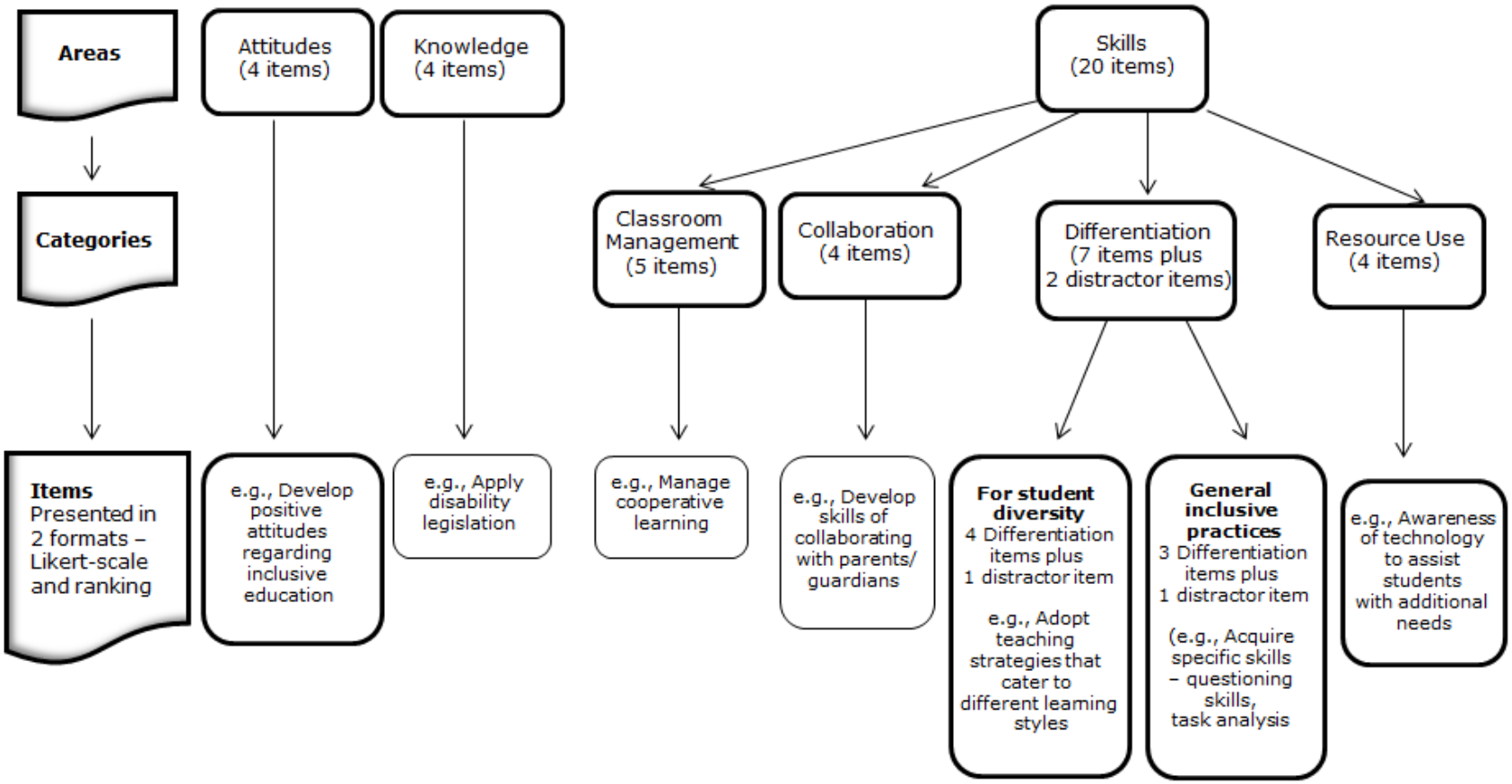


Table 1:
Five Factor Loadings for Pre-service Teachers on Preparation of Pre-service Teachers' Questionnaire using Principal Component Analysis with Varimax Rotation

	Factor loading				
	1	2	3	4	5
Item	Collaborative Interactions	Embracing Inclusive Principles	Differentiating for Student Needs	Inclusive Classroom Management	Promoting Inclusive Capacity
Collaborate with assistants/aides	.827	.241	.096	.235	.037
Awareness of support personnel	.773	.157	.368	.138	.111
Collaborate with support teachers	.773	.175	.163	.279	.175
Develop individual education plans collaboratively	.714	.004	.162	.113	.352
Strategies to teach social skills	.495	.329	.162	.437	.021
Evaluate resources	.469	.415	.284	.233	.027
Positive attitudes regarding inclusion	.077	.834	.221	.189	-.093
Adapt to meet the needs of all students	.131	.676	.312	.119	.161
Understand benefits of inclusion	.072	.671	.263	.164	.229
Apply disability legislation	.194	.586	.020	.093	.133
Apply syllabus information	.115	.583	.096	.216	.348
Examine views about disability	.227	.379	.291	.209	.312
Adjust and accommodate for students with additional needs	.146	.336	.725	.174	.044
Technology to assist students	.138	.127	.686	.129	.417
Match resources to students' needs	.309	.219	.664	.193	.088
Assessment to determine learning needs	.129	.227	.621	.314	.452
Strategies for specific disabilities	.310	.244	.529	.233	.258
Adapt the physical environment	.419	.149	.461	.427	-.006

(continued)

Table 1. (continued)

	Factor loading				
	1	2	3	4	5
Item	Collaborative Interactions	Embracing Inclusive Principles	Differentiating for Student Needs	Inclusive Classroom Management	Promoting Inclusive Capacity
Cater to different learning styles	.301	.201	.101	.739	.224
Acquire specific skills	.249	.233	.188	.700	.179
Skills to manage students with challenging behaviours	.036	.105	.368	.672	.274
Manage co-operative learning	.193	.286	.384	.560	.023
Differentiate for very capable students	.378	.202	.291	.551	.099
Implement risk assessments	.374	.032	-.126	.456	.438
Apply behaviour management theories	-.057	.081	.350	.284	.720
Exam special provisions	.172	.392	.155	.070	.658
Referral processes to gain assistance	.315	.473	.034	.060	.598
Collaborate with parents/guardians	.329	.058	.424	.244	.565

Note. Major loadings for each item are in bold font.

Table 2:
Five Factor Loadings for Experienced Teachers on Preparation of Pre-service Teachers' Questionnaire using Principal Component Analysis with Varimax Rotation

	Factor loading				
	1	2	3	4	5
Item	Inclusive Teaching approaches	Resourcing and Supporting Inclusion	Inclusive Strategies for Individual needs	Embracing Inclusive Principles	Inclusive Organisational Procedures
Skills to manage students with challenging	.748	.149	.334	.073	.108
Acquire specific skills	.742	.348	.162	.207	.083
Apply behaviour management theories	.718	.053	.280	.071	.297
Manage co-operative learning	.670	.457	-.029	.223	.004
Differentiate for very capable students	.634	.361	.343	.110	.082
Assessment to determine learning needs	.586	.195	.458	.183	.299
Collaborate with parents/guardians	.570	.219	.302	.253	.257
Match resources to students' needs	.482	.287	.464	.227	.221
Collaborate with assistants/aides	.167	.813	.217	.107	.209
Evaluate resources	.214	.750	.233	.130	.202
Collaborate with support teachers	.361	.690	.337	.133	.133
Implement risk Assessments	.174	.675	.336	.091	.181
Awareness of support personnel	.421	.596	.105	.112	.238
Technology to assist students	.282	.469	.415	.029	.443
Adjust and accommodate for students with additional needs	.321	.224	.710	.186	.322
Strategies to teach social skills	.190	.517	.636	.153	.071
Cater to different learning styles	.321	.184	.574	.243	-.159
Develop individual education plans collaboratively	.348	.335	.572	.211	.152
Adapt the physical environment	.278	.423	.546	.113	.286
Strategies for specific disabilities	.314	.361	.511	.205	.395
Understand benefits of inclusion	.106	.138	.131	.863	.004
Positive attitudes regarding inclusion	.088	.169	.018	.818	.118
Adapt to meet the needs of all students	.216	-.068	.335	.732	.119

Table 2. (continued)

	Factor loading				
	1	2	3	4	5
Item	Inclusive Teaching approaches	Resourcing and Supporting Inclusion	Inclusive Strategies for Individual Needs	Embracing Inclusive Principles	Inclusive Organisational Procedures
Apply disability legislation	.096	.056	.248	.596	.283
Examine views about disability	.232	.363	-.033	.582	.360
Referral processes to gain assistance	.125	.273	.162	.153	.748
Exam special provisions	.195	.414	-.003	.246	.643
Apply syllabus information	.233	.097	.250	.445	.616

Note. Major loadings for each item are in bold font.

External validity is the extent to which the study results can be generalised to other situations, populations and times (Bryman, 2012). Although caution should be exercised with regard to generalising the results, the large and representative sample of experienced teachers suggests that those results could be generalised to a population of NSW Department of Education teachers (i.e., those in public government schools). Construct validity refers to the extent to which a higher-order construct (or factor) is accurately represented in a study (Burke Johnson & Christensen, 2014, 659). Construct validity of the questionnaire was determined using exploratory factor analysis (EFA). EFA explores correlations within the data to identify relationships between variables that suggest underlying broad constructs (factors) (Kline, 1994). This technique is commonly used to validate the construction of self-reporting scales (Williams, Onsman, & Brown, 2010). Data were considered suitable for factor analysis, with appropriately strong inter-item correlations (Pallant, 2011).

EFA was performed on pre-service and experienced teacher group data separately. This was based on recommendations by leading authors in the field. When performing factor analysis, Tabachnick and Fiddel (2013) and Hills (2011) caution against pooling the results of different samples for the following reasons: firstly, the groups are likely to be different with regard to a variable; in this case the teachers are more experienced than the pre-service teachers. Thus, pooling results is likely to mask differences between groups (Tabachnick & Fiddel, 2013). Secondly, the underlying factor structure may change as a result of experience or intervention (Tabachnick & Fiddel, 2013). As such, Tabachnick and Fiddel (2013) suggest that the differences between the groups on EFA may be revealing. In both groups, sample sizes and the ratio of participants to number of variables were sufficient for factor analysis (Kline, 1994; Tabachnick & Fiddel, 2013).

Questions that asked *to what extent* participants believed items should be included in inclusive units were subjected to EFA using the extraction method of principal component analysis with a Varimax rotation and Kaiser normalisation (Field, 2009; Tabachnick & Fiddel, 2013). Pre-service (post-unit questionnaire) and experienced teacher data were analysed separately. As the sample sizes were between 120 and 300 an absolute loading value of .45 was selected (Field, 2009).
While the factors identified differed slightly between groups, for the most part there were strong similarities with the majority of items loading onto similar factors. For example, the same four items in each group loaded onto a factor called "Embracing Inclusive Principles". Within both groups low correlations between factors suggested these were identifying discernibly independent constructs. Table 1 shows the results of EFA for pre-service teachers and Table 2 shows the results of EFA for experienced teachers. Overall, the EFA results confirmed that the questionnaire was measuring the conceptual constructs of attitudes, knowledge and skills as intended. This evidence supports the questionnaire's construct validity.

Reliability refers to the consistency or stability of scores resulting from the use of a tool such as a questionnaire. Internal consistency is one type of reliability. The term refers to how consistently the items on a test measure a construct or concept (e.g., inclusive classroom skills) (Burke Johnson & Christensen, 2014). Cronbach's alpha coefficient is used to measure this particular type of reliability. To explore the internal consistency of the questionnaire, subscales were defined comprising items that that had loaded together on factors identified by EFA. Pre-service teachers (post-unit questionnaire data) and experienced teachers' subscales data were examined separately. Cronbach's alpha values above .7 are considered to indicate acceptable levels of reliability (Pallant, 2013). The majority of subscales showed good to very good internal consistency (Cronbach's alpha's ranging from .785 to .914), with minimal redundancy of items (see Table 3 and Table 4) suggesting that items made a meaningful contribution to questionnaire performance (Kline, 1994).

Table 3:
Cronbach's Alpha for Factors from Post-unit Questionnaire Pre-service Teacher Data

Subscale title	Number of items	Cronbach's alpha
Collaborative interactions	6	.885
Embracing inclusive principles	5	.804
Differentiating for student needs	6	.849
Inclusive classroom skills	6	.834
Promoting inclusive capacity	4	.807

For the pre-service teachers, two subscales were identified on which one item was redundant. As deleting these items resulted in only minimal increases in reliability, no items were deleted.

Table 4:
Cronbach's Alpha for Factors from Experienced Teacher Data

Subscale title	Number of items	Cronbach's alpha
Inclusive classroom skills	8	.914
Resourcing and supporting inclusion	6	.903
Inclusive strategies for individual needs	6	.887
Embracing inclusive principles	5	.830
Inclusive organisational procedures	3	.785

The experienced teacher data showed redundancy for only one item on one subscale. As deleting the item made only a minimal increase in reliability and as all of the items had an item correlation above .3, no items were deleted (Hills, 2011).

Two distractor items were included in the questionnaire. Reassuringly, the results showed the distractor items had performed as intended. There was a significant moderate correlation between these two items (r =.609, p =.000), with no significant correlation between these and other items, and neither item loaded sufficiently on factor analysis Both pre-service (post-unit questionnaire data) and experienced teachers showed low levels of agreement with the statements '*adopt strategies that ignore the individual differences of students'* and '*assess all students using the same methods'*. Importantly, these results further support the questionnaire's construct validity. Further, these results suggest that questions had been interpreted correctly and that, despite the risk of participant overload, participants had been attentive to the questions and had answered honestly (see Table 5).

Table 5:
Level of Agreement about the Extent to which Distractor Items should be Covered

	Pre-service Teachers		Experienced Teachers				
	M [a]	SD	M [a]	SD	95% CI	t	df
Adopt strategies that ignore individual differences of students	3.43	2.23	3.2	2.31	.25, .71	.83	431
Assess all students using the same assessment methods	3.77	2.14	3.26	2.11	.06, .95	.86	430

Note: M = mean, SD = standard deviation, CI = confidence interval, t = t-statistic, df = degrees of freedom.
[a] 1= no extent to 7 = very high extent.

Discussion

This paper presents a detailed account of the development and initial validation of a questionnaire that was purpose-specific for the topic of research. The procedures described in the paper are readily adaptable across disciplines and can inform questionnaire development in other fields of research.

Strengths and Limitations

Participant load is a concern when designing questionnaires, because answering lengthy, time-consuming questionnaires can lead to 'overload' resulting in fatigue, boredom and/or loss of attention; which can adversely impact on the quality of responses (Visser, Krosnick, & Lavrakas, 2000). Rather than using different response formats to explore the same item, choosing to use either only Likert-scales or ranking questions would have shortened the questionnaire. However, indications were that respondents did not find the length of the questionnaire onerous and responses gathered from the different formats yielded more informative and meaningful data. To enhance reliability, it is recommended that the questionnaire be used as an online tool to avoid the possibility that participants treat ranking questions as Likert-scales, as on hard-copy questionnaires ranking questions appear similar to Likert-scale questions. Online '*drag and drop'* options prevent this from happening. Alternatively, if using hard-copy questionnaires, it is recommended that instructions and the format of ranking questions be modified by asking participants to use numerals *1, 2, 3, 4* to indicate the degree of importance. Many of the programs available for questionnaire construction, for example *Qualtrics*, involve an investment of time to train and acquire the necessary skills. While less sophisticated tools are available these often come with restrictions on the nature of the resultant questionnaire.

One aim of this paper was to inform readers about the development and initial validation of a questionnaire to inform pedagogy and curriculum that could improve the preparation of pre-service teachers for contemporary inclusive teaching. The questionnaire psychometrics (reliability and validity) show that the questionnaire performed well with this study sample. Importantly, the study results show that the questionnaire was able to identify meaningful differences between groups and changes across time (pre- and post- intervention). Reliability and validity, however, are context specific and further research is needed to ascertain the psychometric properties of the questionnaire in other samples (Streiner & Kottner, 2014). Generalisability of the questionnaire results would be enhanced by using it in different settings and with other

groups (e.g., pre-service teachers in other universities, experienced teachers in other types of school systems).

Conclusion

Novice researchers are often unaware of the challenges involved in developing an effective questionnaire. This article highlights factors to consider when constructing a questionnaire, including determining content, structure, question type and presentation. It is imperative when developing a questionnaire to start with the 'end' in mind. The integrity of research findings is, to a large extent, dependent on the quality of the tool used to generate the underlying data. As such, developing a research tool warrants care and rigour.

The results suggest that the questionnaire is a reliable tool for conducting further research about enhancing pre-service teachers' preparedness for contemporary inclusive teaching. It may also prove useful to evaluate inclusive education during initial teacher education. The methods described here are applicable across research settings and disciplines. Further evidence is needed to support the methodological approach to the questionnaire design within the context of the specific field of research, and to confirm the results. Future research could explore the questionnaire's utility for informing pre-service teacher preparation where inclusive education is not a stand-alone unit.

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Author contribution

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