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Measuring preservice teachers' attitudes towards inclusive education: Psychometric
properties of the TAIS scale

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Abstract

The Teachers' Attitudes towards Inclusive Education (TAIS) scale was designed to measure pre-service teachers' attitudes towards inclusion, as defined in the Salamanca Statement of UNESCO. The 10-item scale was developed using a sample of 185 final-year pre-service subject teachers. It was validated in four subsequent studies with various samples of teachers and pre-service teachers. The unidimensionality of the scale was established in all samples except the first-year students, and its validity was confirmed in psychometric analyses. The scale is suggested for use in intervention studies aiming to develop positive attitudes towards inclusion among teachers and pre-service teachers.

Keywords: inclusive education, scale development, attitude, pre-service teacher, factor analysis

Measuring Pre-service Teachers' Attitudes towards Inclusive Education: Psychometric

Properties of the TAIS Scale

1. Introduction

It has been widely acknowledged that the demands on schools and teachers are becoming increasingly complex in the modern society (e.g. OECD, 2005). The OECD report (p. 97) describes the new challenges facing schools as follows:

Society now expects schools to deal effectively with different languages and student backgrounds, to be sensitive to culture and gender issues, to promote tolerance and social cohesion, to respond effectively to disadvantaged students and students with learning or behavioural problems.

Attempts to successfully tackle these demands have been conceptualised in the idea of inclusive education, first launched as an international goal by the United Nations Educational, Scientific and Cultural Organization in the Salamanca Statement (UNESCO, 1994), and recently defined as non-discriminatory quality education for all in a way that respects diversity and the different needs of students (UNESCO, 2009).

The demand for inclusive education became part of the international legal framework through the enactment of the Convention on the Rights of People with Disabilities (United Nations, 2006). According to Article 24.1 of the convention, "State Parties shall ensure an inclusive education system at all levels" (United Nations, 2006, p. 16). Inclusion has now been established as a key concept in the educational policy of many international organizations, including the United Nations (2006), UNESCO (1994), the OECD (2005), the

WHO (2011), the European Commission (2010a), The Council of the European Union (2010), and the European Agency of Special Needs Education (EADSNE, 2009, 2010, 2011, 2012).

The growing international commitment to human rights has led to the view that separate educational facilities for diverse populations represents a threat to their equal rights as citizens. While initially having a special focus on children with disabilities, inclusion is now used to refer to full learner diversity, including gender, sexual orientation, ethnic, cultural, linguistic or religious background, socio-economic status, disability and special educational needs (European Agency of Special Needs Education, 2010, p. 7). Inclusive education has become a vehicle for resisting all kinds of rejection, be it based on disability, race, gender, poverty or other forms of difference.

A recent conclusion of the Council of the European Union confirmed that the excellence of educational systems and the pursuit of social inclusion of all citizens should not be seen as mutually exclusive but as complementary goals, stating that “successful inclusion of pupils with special needs in mainstream settings benefits all learners” (2010, pp. 4–5). The aim is a high performing school system committed to both equity and excellence.

The most enduring attainment of the international movement on inclusive education might well have been the vastly increased knowledge regarding how to promote inclusion in the classroom. The number of research articles and textbooks on inclusive education has grown exponentially (e.g. UNESCO, 2001). This research has identified the central importance of teacher education and especially pre-service teacher education in the pursuit of inclusive schools (WHO, 2011; UNESCO, 2001, 2008; European Agency for Development in Special Needs Education, 2010). The WHO World Report on Disability (2011) deemed the appropriate training of mainstream teachers crucial in achieving confident and competent teachers for children with diverse educational needs. According to the report, “The principles

of inclusion should be built into teacher training programmes, which should be about attitudes and values not just knowledge and skills” (WHO, 2011, p. 222). This emphasis is in line with empirical findings on the importance of teacher characteristics to learner achievement. When the contributions of student, home, school, teacher, curricula, and teaching-related variables were compared, it was found that the variables relating to the teacher characteristics had the largest effect on learning (Hattie, 2009). In particular, the accepting relationship towards the child has been confirmed as an influential factor associated with good learning outcomes (Cornelius-White, 2007).

1.1 Measuring teacher attitudes towards inclusive education

In order to study the effects of teacher training programmes, it is fundamental to be able to use psychometrically sound instruments to measure the attitudes of teachers and pre-service teachers towards inclusive education. Teachers’ attitudes towards inclusive education have been an object of extensive study for decades (Avramidis & Norwich, 2002; de Boer, Pijl, & Minnaert, 2011; Scruggs & Mastropieri, 1996) whereby the number of studies amount to several hundred (de Boer et al., 2010). Typically, each study has used its own method/s to measure teacher attitudes. Generally, however, these studies have not paid much attention to the psychometric properties of their measuring instruments to the extent that the exact wordings of the variables assessing teacher attitudes are not reported.

Attempts have also been made to construct reliable and valid scales to measure teacher attitudes towards inclusion. The development of psychometrically sound scales is advisable because such scales improve the reliability and validity of the measurements and provide possibilities for comparative studies and further theoretical development. Some examples of scales developed thus far are given in Table 1. The list is based on a preliminary, unsystematic literature search from some main electronic databases, including ERIC,

PsycINFO, Academic Search Elite, ProQuest Education Journals, ProQuest Psychology Journals and PsycARTICLES, using “attitudes”, “teacher”, “teacher attitudes”, “pre-service teachers” and “inclusion” as keywords. In all, 144 studies on teachers’ or pre-service teachers’ attitudes towards inclusion were found. The means of measuring these attitudes were examined, and the study was added to the list presented in Table 1 if the following three conditions were fulfilled: a) the items of the attitude scale were given in the study, b) some psychometric data on the scale was reported, for example, reliability or factor structure, and c) the attitude scale was used in at least one other study to further examine its validity. Without seeking a precise description of the current situation, Table 1 provides an overall picture of some of the main instruments developed in the field.

1.2 Aim of the study

Considering the fact that a great number of scales have been developed for this purpose, one could ask whether there is a need for additional scales. However, there are no absolute criteria for an ideal scale measuring teachers’ attitudes towards inclusion. The characteristics of a good scale depend on several factors, including the specific purpose of the research. In the present study, five criteria were underscored. The first criterion was construct validity. In order to warrant good construct validity, the scale should encompass a wide array of themes considered critical in the implementation of inclusive education. The second criterion was brevity. The scale should be sufficiently brief to ease its enclosure into questionnaires, which may include several other scales. However, the level of brevity should not be achieved through reduced coverage of the target construct. The third criterion was internal consistency as a measure of reliability. A good scale requires that the items have sufficiently high intercorrelations with each other. This indicates that they measure the same construct. The fourth criterion was unidimensionality. This requirement was based on the theoretical

assumption that teacher attitudes towards inclusion ideally contain only one dimension extending from acceptance to rejection. If it is possible to construct a one-dimensional scale, it would make further analysis simpler and more understandable. The fifth criterion was simplicity. The items should be easy to understand and answer.

No one of the existing scales presented in Table 1 fulfilled all of the five criteria listed; especially, unidimensionality was not acquired by any of the scales. In fact, unidimensionality was not always a requirement because the content of some scales was divided into distinct domains. The reliability of all scales listed in Table 1 was good. The length of the scales varied between 12 and 30 items, and many scales were quite short. However, the shortest scale, MTAI-SF (Stoiber, Gettinger, & Goetz, 1998), was developed on the basis of a sample containing both parents and teachers and, therefore, did not purely represent the perspective of teachers. The construct validity of some scales could be questioned. The PIE scale of Moberg (1997) mainly contained items about facts and not values, example “All students will receive appropriate education and related services in regular education”. Such statements of fact could very well be rejected by persons who may otherwise support inclusion. Therefore, the scale seemed to measure quite extremist attitudes rather than a wide array of opinions.

The aim of this study was to develop a scale that would incorporate all the five criteria set above. The planned target group for the application of the scale were pre-service and in-service teachers. The scale development process consisted of several phases. In study I, the new scale was constructed stepwise on the basis of psychometric analysis using a sample of pre-service subject teachers as participants. In Finland, subject teachers work mainly at junior secondary education level in grades 7–9. In the subsequent four studies, additional samples were used to investigate and confirm the validity and reliability of the scale.

2. Study I: Construction of a New Scale

The first phase of the construction of the scale involved devising an initial definition of inclusive education, writing an initial pool of items, collecting data and reducing the number of items on the basis of stepwise psychometric analysis. Following this, the properties of the new scale were analysed using content analysis, item analysis and analyses of dimensionality or structure. Finally, the construct validity of the scale was evaluated.

2.1 Definition of the concept

The concept of inclusive education, having been born and spread a few years earlier in some disability organizations, such as TASH in the US, became internationally famous through the Salamanca Statement (UNESCO, 1994). The definition of inclusion given in the Salamanca Statement was summarized in the second chapter of the declaration as follows: “Those with special educational needs must have access to regular schools which should accommodate them within a child-centred pedagogy capable of meeting these needs” (UNESCO, 1994, p. viii). Thus, positive attitudes towards inclusive education means accepting all children in mainstream classrooms and making necessary accommodations for them. The concept of inclusive education incorporated the brand new idea that even those groups, such as children with severe disabilities, who were previously unacceptable within mainstream classrooms can and should be integrated with the provision of adequate support. The emphasis of the concept was strongly on the outcome – actual inclusion through various means of support – and not on the more or less speculative processes hopefully leading towards inclusion.

2.2 Writing an initial pool of items

A pool of survey items was developed by the author on the basis of contemporary discussion on various dimensions of inclusive education. All of the items were meant to measure the opinion of the respondent concerning the placement of a child with special educational needs (SEN) either in a mainstream classroom or in a special education classroom. In order to foster heterogeneity, different wordings and ideas were tested in creating the pool of items. Cullen, Gregory and Noto (2010) described three critical dimensions in the attitudes and beliefs of teachers towards inclusive education: a) attitudes towards students in inclusive settings, b) beliefs about professional roles and responsibilities and c) beliefs about the efficacy of inclusion. The item pool contained items from all of these groups. Each item was written in the form of a claim to be answered using a 4-point Likert scale with four alternatives: 1) strongly disagree, 2) disagree, 3) agree or 4) strongly disagree.

2.3 Participants and data collection

A total of 185 pre-service subject teachers were contacted during their university course on educational psychology organized as a part of their studies in the department of teacher education. The questionnaire was delivered to the participants at the beginning of the lecture, and it was stressed that participation was both anonymous and voluntary and that it was acceptable to opt out. The procedure used here and in the subsequent studies followed the ethical standards of the National Advisory Board on Research Ethics in Finland (2009). The questionnaire was returned by almost all students present at the lecture comprising 73% of all students who were graded on this study module.

The mean age of the participants was 25 years ($SD = 4$). Among them, 75.7% were female, and 24.3% were male. A total of 157 participants replied to all the items presented, and 168 replied to all the items retained in the final scale.

2.4 Reduction of the number of items

The reliability of the initial scale containing 65 items was $\alpha = .95$. A stepwise reduction of items was performed on the basis of item/total correlation coefficients and Cronbach's alfa coefficient until the number of items was reduced to 10. As a first step, those items whose correlations with the sum total of the scale were less than .25 were removed from the scale. Six items were excluded on the basis of this criterion, among them "The place of learning is not the most important thing; the quality of teaching is", "I rely on the high quality of teaching in special education classrooms", and "School integration is not a yes-or-no question – it must be considered case by case". These items were omitted in order to clean up the test pattern from those items which explained very little of the total variance and apparently did not share the same content area with other variables. After omitting these six items, the value of Cronbach's alfa (α) remained the same as before.

In the next phase, only those items whose correlation with the sum total of the scale was higher than $r = .600$ were retained. Eleven items survived this criterion. The reliability of the scale consisting of these items was $\alpha = .89$. Among the items removed in this phase were, for example: "If a child cannot be educated in a mainstream classroom, he should be moved immediately to a special classroom" ($r = .519$), "I am willing to teach a student with special educational needs in my classroom" ($r = .528$), and "More research is needed before children with special educational needs can be placed into mainstream classrooms" ($r = .521$).

One item with the lowest correlation (.611) was removed from the scale: "The education of children with mild learning problems should be arranged in mainstream classrooms with the provision of adequate support". The wording of this item was similar to two other remaining items, the sole difference being the SEN category mentioned. The omission did not change the value of the reliability of the scale.

2.5 Properties of the final scale

The items remaining in the final scale of the “Teacher Attitudes towards Inclusive Education Scale” (TAIS) are presented in Table 2. The reliability of the scale was $\alpha = .89$. The correlation of this 10-item scale with the original 65-item scale was $r = .94$, which meant that the new scale explained 88% of the variance of the original scale. In order to arrive at a sum total to indicate a more positive attitude towards inclusive education, the values of six items (1, 3, 5, 6, 8) were reversed before counting them together.

2.5.1 Content analysis

A content analysis of the items indicated that four types of content remained in the scale: a) issues concerning outcomes of inclusion, b) the rights of the child, c) the workload of the teacher and d) general value statements on the desirability of inclusive placements (Table 2). This richness and variety in the content strengthen the construct validity of the scale and correspond with the analysis of Cullen, Gregory and Noto (2010) on the three dimensions of teacher attitudes towards inclusion mentioned earlier.

2.5.2 Item analysis

The sum total distribution was slightly positively skewed with a skewness of .241 and a standard error of .194. The value of kurtosis was .841, indicating that observations were clustered more around the centre of the distribution compared with the normal distribution. The mean of the items varied from 2.0 to 3.1 on a scale from 1 to 4, which meant that the item difficulty did not vary significantly. The standard deviations of the items varied between .67 and .80, thus guaranteeing at least a moderate variance for each item. The intercorrelations of the test items were mostly on a moderate level, indicating that the items were not too close to each other. The proportion of negative versus positive assertions on inclusion was 6/4. Thus, the tendency to answer in the direction of the statement was optimally balanced.

2.5.3 Dimensionality

An exploratory factor analysis was conducted on the 10-item scale in order to study its latent dimensions. The correlations between the items were high and did not go below $r = .27$ in any case. Bartlett's test of sphericity was also highly significant, $X^2(45) = 694.417$, $p = .000$, indicating the suitability of data for factor analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.90, which was excellent. The normalcy of the sum total distribution of the scale was confirmed by the value of the skewness = $-.111$ while the standard error of the skewness was $.187$. An initial solution using the principal axis extraction method confirmed the strong unidimensionality of the scale. The first factor had an eigenvalue of 5.0, explaining 44.6% of the total variance, while the eigenvalue of the second factor remained below 1. The Cattell scree test also supported the conclusion of the unidimensionality of the scale.

2.5.4 Validity

Test validity "refers to the degree to which evidence and theory support the interpretation of test scores entailed by proposed uses of tests" (American Educational Research Association et al., 2002, p. 9). Validity is not a property of the measurement but has to do with the interpretation of the test scores for the proposed uses. Therefore, a rationale needs to be presented regarding the applicability of the test to the planned use (American Educational Research Association et al., 2002).

The Teacher Attitudes towards Inclusion Scale (TAIS) is proposed to predict the predisposition of an in-service or pre-service teacher to accept a child with special educational needs into a mainstream classroom. Traditionally, attitudes have been divided into three camps: cognitive, affective and behavioural (Hollander, 1971, p. 238). In considerations of attitudes towards inclusive education, the cognitive component would

contain statements on the proposed positive or negative consequences of inclusion as well as its technical feasibility. The affective component would contain statements on the desirability of inclusion and on its fit with other important values, for example, the rights of the child. Finally, the behavioural component has to do with the readiness of the teacher to act according to the expressed cognitive and affective beliefs and views and promote inclusion in practice. This classical division, however, may not be very helpful because the three elements are intricately intertwined.

Another way to analyse the item contents would be to ask whether they contain factual or normative statements. The analysis of the item contents is presented in Table 2. Three items on the scale clearly contained normative statements expressing what “should” be done (items 2, 4 and 7). These items were value statements articulating the normative desirability of inclusion and were theoretically the most unproblematic in relation to the construct under measurement. Similarly, two items pertained to the “right” of the child to a certain treatment (items 3 and 9). These items were also akin to a value rhetoric because in ordinary speech, “rights” are typically cited metaphorically without direct reference to specific written legislation.

Two items evaluating the workload of the teacher in inclusive education were selected in the final scale (items 5 and 8). On an initial reading, it could seem that these items measure a construct that differs from the desirability of inclusion. However, at least in the target group of this scale, there was correlation between the attractiveness of inclusion and the judgements made regarding the expected workload of teachers. The three remaining items (1, 6 and 10) assessed the expected learning outcomes of children in different settings. These items were fact statements which correlated with evaluations concerning the desirability of inclusion.

Even if the items were selected on the basis of a highly mechanical psychometric procedure from the pool of 65 original items, the end result indicates richness of content and the presence of several key themes surrounding the discussion on inclusion, such as the civil rights of children, expected educational outcomes and the workload of teachers (Dyson, 1999; Gunnþórsdóttir & Jóhannesson, 2014). This versatility adds to the content validity of the scale or the extent to which the scale represents various sides of the construct of interest (American Educational Research Association et al., 2002, pp. 18–19).

3. Study II

The aim of the second study was to extend the use of the scale from pre-service teachers to in-service teachers and to further evaluate its psychometric properties with a fresh sample in order to cross-validate the results. The participants of the second study were 65 in-service teachers from class levels 1 to 6 in three municipalities in Eastern Finland. Permission for the study was first granted from the principals of the schools. Out of 38 schools, 11 accepted the invitation to participate in the study. It was explained that the object of the study was to investigate the attitudes of teachers towards inclusive education. It was stressed that individual teachers would not be identified and that participation in the study was voluntary. With the help of the school staff, the questionnaires were delivered to all teachers in the participating schools. The questionnaires were then returned by post. Of all teachers in the study schools, 58% returned the questionnaire. Among the respondents, 72% were women, and 28% were men. Their mean age was 45 years, with a minimum of 25 and a maximum of 65 years.

The scoring of the items was changed from the four-item scale to a five-item scale by adding a midpoint of “neither agree nor disagree”. This was done in order to obtain more

variance in the distribution which, in the first sample, was strongly centred on the mean. The change in scoring was retained in all subsequent studies.

The reliability of the scale was $\alpha = .90$. The principal axis factor analysis confirmed the unidimensionality of the scale. The first factor had an eigenvalue of 5.3 and explained 49.1% of the total variance. The Cattell scree test equally confirmed the unidimensionality of the test structure.

4. Study III

The aim of the third study was to validate the findings of the earlier studies with yet another sample of pre-service subject teachers. The aim was also to study the discriminant validity of the scale with a scale measuring teacher efficacy in implementing inclusive practices. The concept of self-efficacy is derived from Bandura who defines it as “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (1997, p. 3). Teachers’ self-efficacy has been understood as the confidence which teachers hold about their individual and collective capability to influence student learning (Klassen, Tze, Betts, & Gordon, 2011). Sharma, Loreman and Forlin (2012) developed an 18-item scale to measure teachers’ self-efficacy to teach in inclusive classrooms (TEIP).

The participants of the third study were 170 pre-service subject teachers attending the final lecture of their university teacher education. They comprised 90% of all students participating in the final study module. The data were collected at the start of the lesson by means of a questionnaire. It was emphasized that participation was voluntary, confidential, and did not affect the evaluation of the students’ study attainment. The mean age of the participants was 26.0 years (SD = 3.1). Among them, 64.5% were female, and 35.5% were male.

The reliability of the scale was $\alpha = .89$. The principal axis factor analysis produced one factor with an eigenvalue greater than 1. The eigenvalue of the first factor was 4.97, confirming the unidimensionality of the scale. The Cattell scree test also confirmed this unidimensionality. The correlation between the sum total scores of the TAIS and TEIP scales was $r = .048$, indicating good discriminant validity of the TAIS compared with the construct of self-efficacy towards inclusion (TEIP).

The confirmatory factor analysis was performed in order to test whether the expected one-factor model of the TAIS scale obtained in the pilot study would fit the data on a new sample of final-year pre-service subject teachers. For this purpose, the Mplus 7.3. software and the standard missing-at-random approach (supposing that data are missing at random) were used (Muthén & Muthén, 1998–2012). The parameters of the models were estimated using the full information maximum likelihood estimation with standard errors that are robust to non-normality (MLR estimator). When estimating the parameters in the model, this method uses all observations in a data set without imputing the missing values. The ten items in the scale were set to load on one factor.

The results indicated that the model lacked adequate fit to the data, as measured by Chi square statistics, $\chi^2(45) = 640.062$, $p = .000$, which should be nonsignificant. However, when the model was additionally interpreted using a Comparative Fit Index (CFI) and a Tucker-Lewis Index (TLI) as fit indices, their values (CFI = .928, and TLI = .908) supported acceptable fit, being above the value 0.9 (Bentler, 1990; Hu & Bentler, 1999; Steiger, 1990). Finally, the root mean square error of approximation gave a result of RMSEA = .085, with values below 0.05 denoting a good fit and values from 0.06 to 0.08 indicating a reasonable fit (Steiger, 1990).

5. Study IV

A fourth study was performed to further analyse the psychometric properties of TAIS with a sample of first-year educational sciences students. The convergent and divergent validity of the scale was studied by correlating the TAIS scores with the subscales of the SACIE-R scale (Forlin, Earle, Loreman, & Sharma, 2011). This 15-item scale measures pre-service teachers' perceptions in three constructs of inclusive education. The dimension of sentiments measures comfort levels when engaging with people with disabilities; the dimension of acceptance evaluates the acceptance of learners with different needs; and the dimension of concerns measures possible problems, identified or expected, when implementing inclusion. Of these dimensions, attitudes are closest to the contents of TAIS while concerns are the most distant from it.

The participants of the fourth study were 186 students of education attending a university lesson on educational psychology during the first year of their studies. The data were collected at the start of the lesson by means of a questionnaire. It was explained that participation was voluntary, confidential and did not affect the evaluation of the students' study attainment. Among the participants, 89.2% were female, and 10.8% were male. Their mean age was 21 years. Among them, 36% were pre-service kindergarten teachers, 28% pre-service classroom teachers, 22% pre-service special education teachers, and 14% majored in educational science and adult education.

The reliability of the scale was $\alpha = .81$. The principal axis factor analysis produced two factors with an eigenvalue greater than 1. The eigenvalues were 3.79 and 12.7, respectively. After the promax rotation was performed, two items loaded high in the second factor: "The workload of the teachers should not be augmented by compelling them to accept children with special educational needs in their classrooms" and "Integrated children with special educational needs create extra work for teachers in mainstream classrooms." Thus, the second

factor expressed workload concerns while the first factor expressed accepting attitudes. The correlation of these two factors was $r = .532$. The correlation of the TAIS and SACIE attitudes subscale was $r = .526^{**}$, with the SACIE concerns subscale recorded as $r = -.357^{**}$ and the SACIE sentiments subscale recorded as $r = -.106$.

6. Study V

The aim of the fifth study was to cross-validate the results by using a sample of final-year pre-service classroom teachers as subjects. In this study, the discriminant validity of the scale was again measured by comparing the results with the TEIP, the scale measuring teacher efficacy in implementing inclusive practices (Sharma, Loreman, & Forlin, 2012). The participants were individually given the questionnaire on the occasion of their last study requirement, the finals, during the year 2014. It was explained that participation was voluntary, confidential and did not affect the evaluation of their study attainment. The questionnaire was returned by 53 students. The mean age of the participants was 28.9 years ($SD = 6.5$). Among them, 75.5% were female, and 24.5% were male.

The reliability of the scale was $r = .90$. The principal axis factor analysis produced one factor with an eigenvalue greater than 1. The eigenvalue of the first factor was 5.37, thus confirming the unidimensionality of the scale. The result of the Cattell scree test also confirmed this unidimensionality. The correlation between the sum total scores of the TAIS and TEIP scales was $r = .09$, indicating good discriminant validity of the TAIS compared with the construct of self-efficacy towards inclusion (TEIP).

7. General Discussion

The present study was performed in order to develop a short, reliable and one-dimensional scale to measure pre-service teachers' and teachers' attitudes towards inclusive education as defined in the Salamanca Statement (UNESCO, 1994). The need for

such a scale was confirmed by reviewing the existing scales, which, though demonstrating good psychometric qualities, contained several latent dimensions.

In this study, a new 10-item scale “Teachers’ Attitudes towards Inclusive Education” (TAIS) was developed, and its psychometric qualities were examined in five samples. The original pilot study was performed with a sample of final-year pre-service subject teachers. The subsequent samples consisted of a) in-service teachers, b) another sample of final-year pre-service subject teachers, c) first-year students of education who were mainly pre-service teachers and d) final-year pre-service classroom teachers.

The reliability of the scale was good for all samples, varying between $\alpha = .81$ and $.90$. The unidimensionality of the scale was examined by using exploratory factor analysis in four samples and confirmatory factor analysis in one sample. Unidimensionality was demonstrated in three samples, admitting that the confirmatory factor analysis with a second sample of pre-service subject teachers did not provide a perfect model fit. However, even if χ^2 was significant, two other fit indices indicated that the model afforded a reasonable fit to the data. In the sample of first-year students of education, the factor structure clearly broke down into two dimensions, the first factor expressing attitudes and the second factor expressing workload concerns towards inclusion. The interpretation of the differing results is that first-year students of education could support inclusive education, and at the same time agree on its workload problems, while among older students and in-service teachers, the tendency to express concerns was associated with more negative attitudes towards the desirability of inclusive education. This finding needs additional study for confirmation.

The content validity of the scale was examined by analysing the content of the items selected for the final version. The convergent validity of the scale was demonstrated by its positive correlation with the “Attitudes” domain in the SACIE-R scale and its negative

correlation with the “Concerns” domain in the same scale (Forlin et al., 2011). The divergent validity of the scale was demonstrated through its low correlation with the teacher self-efficacy scale TEIP (Sharma et al., 2012) and the “Sentiments” domain of the SACIE-R scale (Forlin et al., 2011).

Some of the limitations of this study include the small sample size in most cases. However, it has been shown that even samples below $N = 100$ can be applicable to factoring, if, as in the studies presented here, the communalities are high, factors are well determined, and computations converge to a proper solution (MacCallum, Widaman, Zhang, & Hong, 1999). The shortness of the scale should not be considered a problem if, as in this case, the reliability is on an acceptable level and the contents of the scale shows richness and variety. The high correlation of the 10-item scale with the original 65-item scale indicated that it explained the majority of the variance of a much longer scale. The validity of the TAIS scale needs to be further confirmed in future studies using different populations. It is recommended that the content validity and convergent validity of the scale be examined by comparing its results with those obtained with some other scales presented in Table 1. Also, the properties of the scale need to be studied in different teacher categories and different countries. Because the scale was developed using a sample of pre-service teachers, its validity in the populations of in-service teachers needs further study.

7.1 Conclusions

The TAIS scale seems to show satisfactory psychometric properties and could be recommended as a unidimensional measure of attitudes towards inclusive education among advanced pre-service teachers and teachers. There are several applications for this kind of scale. Most importantly, it can be used to evaluate the outcomes of teacher training programmes aiming to promote positive attitudes towards inclusion. The scale may prove

useful both in comparative and intervention studies around inclusive education, for example, in developing teacher education in universities or in supporting inclusive education in schools. Additional study is recommended concerning its applicability in different populations.

8. Acknowledgements

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Table 1

Scales measuring teacher attitudes towards mainstreaming or inclusive education

Study	Acronym	N of items	Original sample	Reliability	Structure
Alvarez et al., 2007	ATI	22-28	preservice	$\alpha = .91$	missing
Antonak & Larrivee, 1995 ¹	ORI	30	preservice	$\alpha = .83$	4 factors
Cochran, 1998	STATIC	20	teachers	$\alpha = .89$	4 factors
Cullen et al., 2010	TATIS	14	teachers	$\alpha = .82$	3 factors
Forlin et al., 2011	SACIE-R	15	preservice	$\alpha = .74$	3 factors
Larrivee & Cook, 1979	ORM	30	teachers	$\alpha = .89$	5 factors
Moberg, 1997, 2003	PIE	19-20	preservice	$\alpha = .86$	4 factors
Sharma & Desai, 2002	CIES	21	teachers & principals	$\alpha = .91$	4 factors
Stoiber et al., 1998	MTAI-SF	12	teachers & parents	$\alpha = .80$	3 domains
Stoiber et al., 1998	MTAI	28	teachers & parents	$\alpha = .91$	3 domains
Wilczenski, 1992	ATIES	16	teachers & preservice	$\alpha = .71 - .89$	4 factors

1) Revision of the ORM Scale

Table 2

Items of the Teachers' Attitudes towards Inclusive Education Scale (TAIS): Means, Standard Deviations and Item/Total Correlations from Study 1 (n = 168)

Item	M	SD	r
Expected outcomes			
1. Children with special educational needs learn best in their own special education classes where they have specially trained teachers. (R)	2.29	.71	.67
6. The best result is achieved if each child with special educational needs is placed in a special education classroom that best suits him/her. (R)	2.50	.78	.77
10. The learning of children with special educational needs can be effectively supported in mainstream classrooms as well.	3.05	.71	.60
Rights of the child			
3. It is the right of a child with special educational needs to get into a special education classroom. (R)	1.99	.80	.58
9. A child with special educational needs should be moved to a special education classroom in order not to violate his/her legal rights. (R)	2.60	.71	.61
Workload of the teacher			
5. Teachers' workload should not be augmented by compelling them to accept children with special educational needs in their classrooms. (R)	2.12	.78	.58
8. Integrated children with special educational needs create extra work for teachers in mainstream classrooms. (R)	2.47	.67	.56
Inclusion as a value			
2. The education of children with emotional and behavioural problems should be arranged in mainstream classrooms with the provision of adequate support.	2.60	.73	.60
4. Children with attention deficit/hyperactive disorder (ADHD) should be admitted in mainstream classrooms with adequate support.	2.91	.74	.63
7. The education of students with special educational needs should be arranged as far as possible in mainstream classrooms.	2.88	.71	.63

Note: Scoring of items marked with R is reversed when counting the sum total.

Table 3

Psychometric Properties of the TAIS Scale: Summary of Four Studies

Study No.	N	Participants	Reliability (α)	Factor structure	Divergent and convergent validity
1	168	Final-year pre-service subject teachers	.89	One factor Eigenvalue = 5.0	
2	65	In-service teachers	.90	One factor Eigenvalue = 5.3	
3	170	Final-year pre-service subject teachers	.89	One factor Eigenvalue = 5.0	Teacher self-efficacy (TEIP) $r = .048$
4	186	First-year students of education	.81	1) Attitudes Eigenvalue = 3.8 2) Concerns Eigenvalue = 1.3	Inclusion: SACIE-R Sentiments $r = -.106$ Attitudes $r = .526^{**}$ Concerns $r = -.357^{**}$
5	53	Final-year pre-service classroom teachers	.90	One factor Eigenvalue = 5.4	Teacher self-efficacy (TEIP) $r = .090$