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## Assessment conception patterns of Finnish pre-service special needs teachers: the contribution of prior studies and teaching experience

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### ABSTRACT


The main aim of this study was to investigate how Finnish pre-service special needs teachers' (N = 134) assessment conceptions, prior academic studies in special education and teaching experience together cluster into different patterns representing different student types. Their assessment conceptions formed three main factors: 1) assessment measures learning, 2) assessment supports teaching and learning, and 3) assessment as a harmful action. All three factors were emphasised differently in each pattern. Assessment conceptions, prior studies, and teaching experience were clustered together in three different patterns: Assessment Criticals, Assessment Positives, and Assessment Cautious. The Assessment Criticals emphasised assessment as a harmful action, and they had fewer prior studies and less teaching experience. The Assessment Positives emphasised assessment for teaching and learning, and they had more prior studies and less teaching experience. Finally, the Assessment Cautious emphasised assessment of learning, and assessment as a harmful action, and they had more studies and more teaching experience. This study shows that relative to national guidelines, students have very different starting points for professional growth during studies. Additionally, this study will discuss the implications for special needs teacher education.

### KEYWORDS

Assessment conceptions; assessment skills; assessment of learning; assessment for learning; pre-service special needs teacher; special needs teacher education

## Introduction

Assessment is an integral part of teaching, and it is therefore included in teacher education as a central set of skills to be learned. The prominent role of assessment in student learning and well-being has been recognised in several studies across different age levels (Arter 2003; Coutts, Gilleard, and Baglin 2011; Gibbs and Simpson 2005; Veldhuis and van den Heuvel-panhuizen 2013). One of the particular responsibilities and tasks of a special needs teacher is to ensure adequate support for learning and schooling (Takala et al. 2018). This task is linked to the continuous, systematic, and regular assessment of learning progress and the effectiveness of the support provided. In addition to assessment knowledge and skills, individual conceptions of assessment direct both how teachers assess students and what kind of conclusions and interpretations they make (Cheng, Cheng, and Tang 2010; Hill and Evers 2016). Furthermore, to understand the processes behind

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assessment practices, we also need to gather information on the conceptions that guide these practices. This is particularly important for pre-service teachers, as the possibility and direction of potential conceptual change during teacher education may depend on their existing conceptions (Green 1971; Xu and Brown 2016). In the current study, the main aim was to investigate how Finnish pre-service special needs teachers' assessment conceptions, prior academic studies in special education and teaching experience together cluster into different patterns representing different student types with differing assessment conceptions and key background factors.

According to Black and William (1998), the focus of attention in assessment studies has shifted towards formative assessment, which emphasises interaction between classroom learning and assessment. Consequently, research interest in traditional summative assessments of learning has decreased. Conversely, governments and international organisations have developed even greater interest in summative assessment in recent times (see, e.g. Brown 2017; Cumming, Van Der Kleij, and Adie 2019). The key feature of formative assessment, which is assessment for learning, includes feedback that is intended to support the learning process. Formative assessment can be viewed from the learner's perspective (what kind of feedback promotes learning) or from the teacher's point of view (what kind of feedback helps the teachers modify their own practices) (Frey and Schmitt 2007). The same change in approach has also been observed in the highly anticipated emergence of tiered frameworks of learning support, such as the Response-To-Intervention (RTI) approach introduced by Fuchs and Fuchs (2005). RTI refers to a process of implementing identification, support and monitoring of progress with intensifying tiers of assessment and support. It has its roots in dynamic assessment (DA; see Grigorenko 2009), in which continuous assessment and teaching are intertwined to gather information to modify teaching and interventions, not to assess students' skill levels or performance as such (Fuchs, Fuchs, and Stecker 2010). The DA model emphasises sufficiently individual assessment and learning potential that will flourish through appropriate teaching and interventions (Fuchs et al. 2007), and is therefore considered as well suited for the assessment of learning support in the context of special education, as well.

Assessment in the context of special education has traditionally been targeted at students' skills and learning achievements with attention focused almost exclusively on the target student (Ysseldyke, Algozzine, and Epps 1983). However, RTI- and DA-like approaches and assessment principles have shifted perspectives from the learner to the teacher, pedagogy and learning environment (Björn et al. 2018; Grigorenko 2009). Even though RTI has gained popularity mainly in the USA, it has gradually also been implemented in Europe (e.g. Finland: see Björn et al. 2018; the Netherlands: see Scholvink and Janssen 2014; Spain: see Jiménez et al. 2010). Since making decisions on the intensity, duration and content of support is one of the key responsibilities of special needs teachers, understanding and applying these assessment-related principles is essential for special needs teachers.

### *Teachers' conceptions of assessment*

Assessment conceptions represent an individual's intuitive understanding of assessment and can thus be objectively incorrect or incomplete (Brown 2008). This intuitive understanding includes prior information as well as beliefs, thoughts, and feelings about assessment. Conceptions have both a cognitive and an affective dimension (Xu and Brown 2016). The cognitive dimension refers to an individual's beliefs about which

assessment-related information is true and which is not. This provides an individual the basis for embracing new assessment information and more easily adopting information that is consistent with our existing conceptions. The affective dimension is formed on the basis of individual assessment experiences and can include both positive and negative emotional experiences, some of which are stronger than others (Crossman 2007). Green (1971) further suggests that conceptions with a strong emotional experience may be more challenging to change than conceptions with a weaker emotional experience.

According to Mockler (2011), the development of teacher identity is mediated by personal experience, professional context, and external political environment. Since assessment conceptions are a key part of a teacher's assessment identity (Looney et al. 2018), the same framework can be used to frame the development of assessment conceptions. Previous studies show that prior personal assessment experiences, before teacher education, play a significant role in structuring one's assessment conceptions (Crossman 2007). For instance, students with negative assessment-related experiences may have more negative conceptions of assessment than students who do not have similar negative experiences. Teacher education is a significant part of the professional context (Mockler 2011). In addition to the theoretical knowledge and practical skills provided, assessment conceptions are suggested to be significantly shaped by one's own experiences of being assessed during teacher education (Smith et al. 2014). Assessment conceptions of pre-service teachers may also change dramatically during practicum periods, as suggested by Xu and He (2019). The political context consists, among other things, of the public debate on the work and training of teachers, and of political decisions that affect the work of teachers and the organisation of training (Mockler 2011). They shape pre-service teachers' conceptions of what is expected of them as a teacher and as an assessor.

Based on previous studies, both teachers' (Brown et al. 2011) and pre-service teachers' (Brown and Remesal 2012) assessment conceptions are context-dependent. Thus, assessment conceptions reflect societal and cultural practices. Assessment conceptions are dynamic (Cheng, Cheng, and Tang 2010; Hill and Evers 2016), and they change during teacher education and later during professional career. However, it requires an active reflection of one's own conceptions. Teachers' conceptions of assessment differ, and teachers' own conceptions of assessment guide their assessment work (Barnes, Fives, and Dacey 2014; Brown 2008). Previous research shows that teachers' conceptions differ in terms of whether they emphasise assessment for learning or assessment of learning (Barnes, Fives, and Dacey 2014). Teachers' conceptions also differ in the level of depth and diversity of reflection (Halinen et al. 2014). Previous studies have also shown that although pre-service teachers have a strong understanding of the principles of assessment for learning and are theoretically aware of the different assessment methods, they do not necessarily apply them in practice (Deneen et al. 2019; Siegel and Wissehr 2011). Thus, possessing theoretical knowledge does not automatically entail the ability to utilise it.

### *Assessment in the Finnish educational context*

The Finnish school system is built on public schools with highly-educated teachers. Teacher education (class teachers, subject teachers, special needs teachers) is based on a master's degree (300 credits/about five years). With a prior master's degree (class

teacher or subject teacher), one can also become qualified as a special needs teacher by having 60 additional study credits in special education. Finnish universities that educate pre-service special needs teachers do not share common curricula (Takala et al. 2015) but they share certain key areas (reading, writing, mathematics, communication, behavioural, socio-emotional challenges, teaching practice) that are common to all of them (Hausstätter and Takala 2008). Special education teachers' work in Finland includes three main areas: teaching, consulting, and background work that includes assessment, planning, and making or selecting instructional materials (Takala, Pirttimaa, and Törmänen 2009). All of these areas are linked to the continuous, systematic, and regular assessment of learning progress and the effectiveness of the support provided.

Children enter the nine-year compulsory schooling system (primary education 1–6, secondary education 7–9) the year they turn seven years old. Since 2015, pre-school attendance for one year prior to entrance to school has been compulsory. National educational standards are locally implemented in curricula by schools ([www.minedu.fi](http://www.minedu.fi)). Since 2011, there has been a national, RTI-based framework called 'Support framework for learning and schooling' with three levels of support for learning: general support (including co-teaching and differentiated teaching as forms of support), intensified support (domain-specific learning plans and support in reading and writing in flexible groups in addition to forms of support mentioned before), and special support (all previous forms of support and individualised education plans). In each level, the student is entitled to a variety of forms of support (e.g. even special education, see authors, 2016). Access to special education services in Finland does not require statements of eligibility, but is based on multidisciplinary decision-making that involves the caregivers' opinions.

In the Finnish educational policy system, municipalities, schools, and teachers have a relatively broad autonomy in interpreting the law and national guidelines. This results in very individual and different ways of conducting assessments and supporting students' learning processes. There are no nationally standardised tests used in Finland for student assessment. In a recent study (Virinkoski et al. 2020), special education teachers ranked their own observations and discussions (with students, parents and other teachers) as the two most relevant sources of information regarding the assessment and follow-up of literacy skills. These indirect practices were considered more important than tests, assessment forms and exams, although the majority of the participants reported using all the aforementioned practices in their work. The aforementioned finding reflects the fact that there are no formal diagnostic criteria for eligibility for support, as well as the teachers' broad professional autonomy. Recent research also suggests that even though the framework for support was renewed in 2011, Finnish special education teachers continue to have better skills in identifying learning difficulties than in monitoring the effectiveness of support (Virinkoski et al. 2018).

### **Current study**

In the current study, the main aim was to investigate how Finnish pre-service special needs teachers' assessment conceptions, prior academic studies in special education and teaching experience together cluster into different patterns representing different student types with differing assessment conceptions and key background factors. Assessment conceptions are key elements of assessment competence since they direct assessment practices as well as conclusions and interpretations made based on assessment information (Hill and Evers 2016).

Since assessment conceptions develop in interaction with both personal assessment history and professional experiences in teacher education and schools (Mockler 2011), the amount of previous theoretical studies and teaching experiences were included in the same analysis with assessment conceptions to build a picture of how these three elements cluster into different patterns representing different student types. In addition, we investigated how these different student types differed in age, prior teacher qualifications and assessor experience.

This study extends prior knowledge in two ways. First, so far, assessment conception studies have included pre-service primary (Hawe 2007; Xu and He 2019) or secondary school teachers (Daniels and Poth 2017), not specifically pre-service special needs teachers as a separate group of professionals. Neither studies investigating in-service teachers' conceptions concentrated on special needs teachers' conceptions, even though conceptions of primary school (Brown 2004; Remesal 2011; Veldhuis and van den Heuvelpanhuizen 2013) and subject teachers in secondary education (Remesal 2011) have been investigated in several studies. Second, research examining the assessment conceptions of Finnish teachers has mainly focused on university teachers (see, for example, Halinen et al. 2014; Postareff et al. 2012). Since previous studies have shown that assessment conceptions are dependent on societal and cultural practices and policies (Brown and Remesal 2012; Brown et al. 2011), there is an evident need for information concerning Finnish pre-service teachers as well. Therefore, this study will also widen the understanding of assessment conceptions in different educational contexts.

In this study, we aim to answer the following research questions:

- (1) What are the emergent pre-service special needs teacher types as defined by assessment conceptions, prior academic studies in special education and teaching experience?
- (2) How do representatives of different student types differ in age, prior teacher qualification, and prior assessor experience?

## Methods

### *Participants and procedure*

Pre-service special needs teachers (N = 134) from three Finnish universities participated in this study. The response rate was 64% (134/209). Forty-one percent of participants (N = 55) had a prior master's degree, including teacher qualification (class teacher or subject teacher), and they were thus completing their additional 60 study credits to qualify as special needs teachers. The rest of the participants (N = 79; 59%) were currently completing their master's degree. There were 121 females (90%), 12 males, and one preferred not to say. This corresponds to the typical proportion of female special needs teachers in Finland (86%; Honkala and Komppa 2020). The respondents' age varied from 19 to 57 (M = 29.84, SD = 9.47).

The data was gathered via a web-based questionnaire, the link to which was provided via course pages on the Moodle learning platform or by email. Even though the link was shared in the context of a particular course, participation was voluntary. All participants signed an informed consent form before participation.

## Online questionnaire

The online questionnaire included items on the teachers' background characteristics, such as age (in years), the amount of previous study in the field of special education (0 = no previous study units, 1 = basic studies 25 ECTS, 2 = intermediate studies 35 ECTS, and 3 = advanced studies 70–90 ECTS), and teaching experience (both general and special education teaching included but not specified) in years (0 = no teaching experience, 1 = <1 year, 2 = 1–5 years, 3 = 6–10 years, 4 = 11–15 years, 5 = >15 years). Prior teaching qualification (0 = no teacher qualification, 1 = teacher qualification) as well as assessment experience (0 = no assessment experience, 1 = prior assessment experience) was also included.

Assessment conceptions were measured with a 20-item questionnaire that included ten items from Brown's (2004) COA-III Instrument (Teachers' Conceptions of Assessment) and ten items constructed for the current study to cover the essential issues of the national standards of assessment in education ([www.minedu.fi](http://www.minedu.fi)) and to complement the special educational perspective. The ten statements from the COA-III represented four purpose-defined conception themes (assessment: describes, improves learning, improves teaching, is bad), that are relevant in the Finnish educational context. The statements were translated into Finnish. The other ten final statements were constructed in co-operation with Finnish experts in special education, assessment and didactics. The final statements represented the assessment of learning (5 items; e.g. 'Assessment sums up what students have learned'), assessment for learning (5 items; e.g. 'Assessment supports learning'), assessment supporting teaching (6 items; e.g. 'Assessment helps improve the quality of teaching') and assessment as harmful (4 items; e.g. 'Assessment is unfair'). The participants were asked to determine what they thought about certain statements that addressed assessment on a scale from 1 to 7, where 1 meant 'completely disagree' and 7 meant 'completely agree.'

## Analysis

The statistical analyses were conducted in the following steps. First, descriptive statistics were calculated for demographic variables. Second, to identify the factors of assessment conceptions, explorative factor analysis (EFA) using principal axis factoring was employed. Solutions for three, four and five factors were examined using oblimin rotation of the factor loading matrix. Items with double loadings were placed to the dominant factor if it was theoretically and conceptually justifiable. The three-factor solution of 1. Assessment supports teaching and learning ( $\alpha = .92$ ; 10 items; example item: 'Assessment supports students' learning'), 2. Assessment measures learning ( $\alpha = .80$ ; 5 items; example item: 'Assessment tells what students can do'), and 3. Assessment as a harmful action ( $\alpha = .71$ ; 5 items; example item: 'Assessment increases inequality'), which explained 58.1% of the variance ( $KMO = .885$ ;  $p < 0.001$ ), was preferred because 1) it was theoretically justifiable, 2) the three-factor structure was the most appropriate based on the scree test (see Costello and Osborne 2005) and, 3) the subsequent factor structures (four and five factors) were difficult to interpret. Even though the items were originally divided on the basis of content into four entities (assessment of learning, assessment for learning, assessment supporting teaching, assessment as harmful), assessment for learning and assessment supporting teaching both loaded strongly for the first factor. Third, regression-based factor scores were saved as composite scores for subsequent use. Fourth, to identify the different pre-service teacher profiles, cluster analysis was conducted using the K-means

method, which is suggested to work well in small to medium data (Jiawei, Kamber, and Pei 2011). The purpose was to differentiate homogenous groups of pre-service teachers by clustering the three assessment factor composite scores, prior teaching experience and prior theoretical studies in the field of special education. All five variables were standardised, and the demographic variables described the order and magnitude, which made them suitable for K-means analysis also (see Ruff 2014). The number of clusters was determined by inspecting the results of hierarchical cluster analysis (dendrogram and agglomeration schedule; see, e.g. Gore 2000) and by testing three-, four- and five-cluster solutions. The three-cluster solution was preferred because it was theoretically interpretable and supported by hierarchical cluster analysis. Fifth, to further test the fit of the cluster solution, discriminant analysis was conducted. Sixth, to test the validity of the clusters, MANOVA was conducted. Finally, to investigate whether there were significant group differences in age, prior teacher qualification, or prior assessment experience, ANOVA with age in months as a dependent factor was conducted, and a chi-squared test for independence between clusters and prior teaching qualification as well as assessment experience was calculated.

## Results

For descriptive statistics for demographic variables and all three composite variables (based on factor scores), see Table 1. Data screening showed that there were no signs of ceiling or floor effects. The skewness and kurtosis values for the composite variables met the criteria for normality. The association between composite variables was determined by means of Pearson correlation analysis. 'Assessment supports teaching and learning' correlated positively and significantly with 'Assessment measures learning' ( $r = .41$ ;  $p < .001$ ), and negatively and significantly with 'Assessment as harmful' ( $r = -.55$ ;  $p < .001$ ). 'Assessment measures learning' did not correlate with 'Assessment as harmful' ( $r = -.03$ ;  $p = .766$ ).

Cluster profiles based on standardised z scores are presented in Figure 1, and descriptive statistics for the three clusters are presented in Table 1. The first cluster ( $N = 27$ ) represents pre-service teachers with below average scores in 'Assessment supports teaching and learning' and 'Assessment measures learning' but high scores in 'Assessment as harmful' (from here on Assessment Criticals). Typical for the teachers in the first cluster were lower amounts of prior theoretical studies in special education as well as minor teaching experience. The second cluster ( $N = 61$ ) represents pre-service teachers with high scores in 'Assessment supports teaching and learning,' just above average scores in 'Assessment measures learning,' and very low scores in 'Assessment as harmful' (from here on Assessment Positives). Typical for the teachers in the second cluster were higher amounts of prior theoretical studies in special education as well as minor teaching experience. The third cluster ( $N = 46$ ) includes pre-service teachers who have quite high scores in 'Assessment measures learning' as well as 'Assessment as harmful' but low scores in 'Assessment supports teaching and learning' (from here on Assessment Cautious). Typical for the teachers in the third cluster were higher amounts of prior theoretical special education studies and long teaching experience. For final cluster centres, see Figure 1.

The discriminant analysis confirmed the fit of the cluster solution (Wilks'  $\lambda = 0.162$ ;  $\chi^2 = 234.94$ ;  $df = 10$ ;  $p < .0001$ ). The cross-validated classification showed that overall 92.5% of the grouped cases were correctly classified. The MANOVA test confirmed that the three clusters significantly differed in all variables (Pillai's Trace = 1.25,  $F(10, 256) = 42.29$ ,



**Table 1.** Descriptive statistics of the variables.

Measure	All participants N = 134				Assessment Criticals n = 27		Assessment Positives n = 61		Assessment Cautious n = 46			
	M	Sd	Skewness	Kurtosis	M	Sd	M	Sd	M	Sd	F	$\eta^2$
Age	29.84	9.47	1.03	0.10	24.93	9.00	27.61	8.07	35.67	8.68	17.56***	.21
Assessment supports teaching and learning <sup>a</sup>	.00	.97	-.88	.41	-1.06	.95	.65	.49	-.24	.78	59.47***	.48
Assessment measures learning <sup>a</sup>	.00	.92	-.55	.26	-.64	.90	-.04	.94	.32	.71	10.79***	.14
Assessment as harmful <sup>a</sup>	.00	.88	.27	.02	.89	.74	-.63	.61	.34	.66	55.85***	.46
Prior theoretical studies	1.15	.92	.46	-.58	.59	.69	1.26	.98	1.32	.84	6.77**	.09
Prior teaching experience	1.49	1.03	.12	-1.12	.74	.81	1.15	.83	2.37	.74	45.37***	.41

Note. <sup>a</sup> = Regression based factor scores. \*\*\* p < .001, \*\* p < .01.

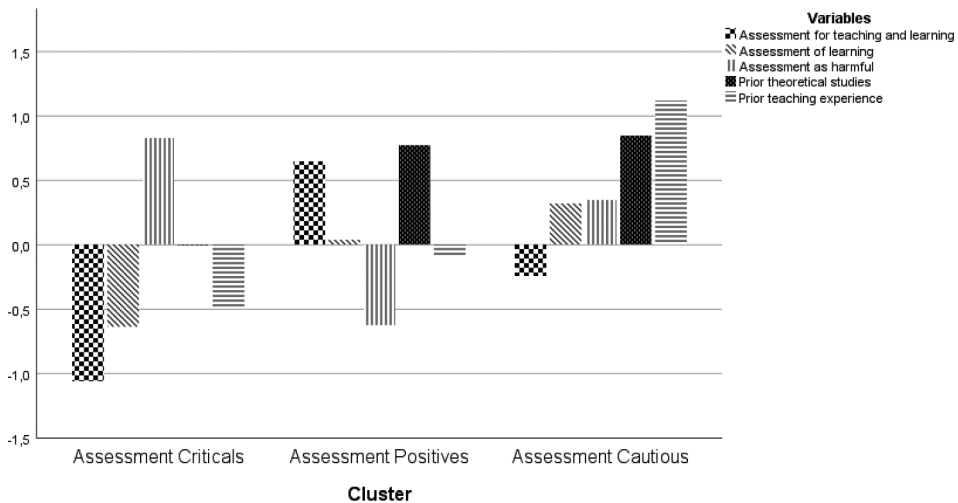


Figure 1. Cluster profiles.

$p < .001$ ,  $\eta^2 = .62$ ; Table 1). More precisely, pairwise post hoc comparisons (Scheffe) showed following group differences, in 'Assessment supports teaching and learning' all the groups differed significantly. Assessment Positives showed the highest scores and Assessment Criticals showed the lowest scores. In 'Assessment measures learning,' Assessment Positives and Assessment Cautious showed higher scores than Assessment Criticals. In 'Assessment as harmful,' all the groups differed significantly; the Assessment Criticals showed the highest scores, and the Assessment Positives showed the lowest ones. Assessment Positives and Assessment Cautious had significantly more prior special education studies than Assessment Criticals. In prior teaching experience, all the groups differed significantly. Assessment Cautious had the most teaching experience and Assessment Criticals the least teaching experience.

Finally, one-way MANOVA showed that the clusters significantly differed in age ( $F = 17.56^{***}$  (2, 134);  $\eta^2 = .21$ ). Assessment Cautious ( $M = 35.67$ ;  $SD = 8.68$ ) were significantly older than Assessment Positives ( $M = 27.61$ ;  $SD = 8.07$ ) and Assessment Criticals ( $M = 24.93$ ;  $SD = 9.00$ ), which is in line with the results showing that they also had the longest teaching experience. Based on crosstabs and a chi-squared test for independence, the three clusters differed in prior teacher qualification ( $\chi^2$  (2, 134) = 50.33\*\*\*). While most (82.6%) of the pre-service special education teachers in the Assessment Cautious group had previous teacher qualifications, most of the pre-service teachers in the other groups did not (Table 2). The three groups also differed on assessment experience ( $\chi^2$  (2, 130) = 27.37\*\*\*). While 59.3% of the Assessment Criticals did not have any prior experience as an assessor, the corresponding percentage for the Assessment Positives was 19.7%, and that of the Assessment Cautious was 6.5% (Table 2).

## Discussion

The results showed that Finnish pre-service special education teachers' assessment conceptions formed three main factors: assessment measures learning, assessment supports

**Table 2.** Differences in prior teacher qualification and assessment experience.

	Prior teacher qualification $\chi^2 = 50.33^{***}$		Prior assessment experience $\chi^2 = 27.37^{***}$	
	Yes	No	Yes	No
Assessment Criticals n = 27	4 (14.8%)	23 (85.2%)	11 (40.7%)	16 (59.3%)
Assessment Positives n = 61	13 (21.3%)	48 (78.7%)	49 (80.3%)	12 (19.7%)
Assessment Cautious n = 46	38 (82.6%)	8 (17.4%)	43 (93.5%)	3 (6.5%)

Note.  $^{***} p < .001$ ,  $^{**} p < .01$ ,  $^{*} p < .05$ .

teaching and learning, and assessment as a harmful action, all of which were emphasised differently in each profile. Similarly to the results of Brown (2004), assessment for learning and assessment supporting teaching loaded on the same factor, reflecting one and the same aspect body (see, however, Remesal 2011 for contradictory results). Pre-service special education teachers' assessment conceptions, prior studies in the discipline of special education and teaching experience clustered together in three different student types: Assessment Criticals, Assessment Positives and Assessment Cautious.

The Assessment Criticals emphasised assessment as a harmful action that belongs to teachers' work instead of as a tool of assessing or supporting learning. Typical of them were lower amounts of prior theoretical studies in special education as well as minor teaching experience, which suggests that their conceptions are strongly influenced by pre-training assessment-related experiences of being assessed. This is supported by the result showing that this group had the highest proportion of students with no experience as an assessor. Previous studies show that prior personal assessment experiences before teacher education play a significant role in structuring one's assessment conceptions (Crossman 2007) and that students with negative assessment-related experiences may create more negative conceptions of assessment than students who do not have similar negative experiences. Negative experiences of assessment do not necessarily relate to poor academic performance. They may be related to any kind of experience of injustice related to assessment situations where the student has not, in his or her own opinion, become fairly assessed or where the student has experienced that the assessment is one-sided or wrong. These experiences are also possible when the student is doing well in school. When it comes to special needs teacher education, Assessment Criticals are a noteworthy group because it has been suggested that these conceptions based on emotional experiences are more challenging to change than conceptions with a weaker emotional experience (Green 1971; Xu and Brown 2016). This kind of negative notion related to injustice and negative consequences of assessment is suggested to appear in contexts that have a high-stakes assessment culture (Brown 2008). This, however, does not apply to Finland, which has broad professional autonomy and lacks a high-stakes testing culture.

The Assessment Positives emphasised assessment for teaching and learning, recognised the need for assessment of learning, and did not consider assessment as a harmful practice. Their conceptions are in line with the ideals of formative assessment and RTI- and DA-like assessment principles that, in addition to student learning, the success of teaching and support must also be assessed (Björn et al. 2018). Typical of this group were higher amounts of prior theoretical studies in special education as well as minor teaching experience. A strong theoretical basis and a short time span from these theoretical studies explain their current up-to-date conceptions. This supports the notion that conceptions are re-constructed during

professional education (Smith et al. 2014; Xu and He 2019) and emphasises the importance of theoretical studies alongside practical studies. Minor teaching experience, and consequently, limited own assessment experience in actual teaching practice, may explain their overly positive, non-critical approach to assessment. Although the Assessment Criticals and Assessment Positives share similar age profiles, the dissimilarities in their theoretical studies and teaching experience may explain the differences in assessment conception patterns. Assessment Positives had more theoretical studies and longer teaching experience and reported more assessment experience than the Assessment Criticals.

The Assessment Cautious emphasised assessment of learning, and disadvantages of assessment. Typical for this group was the higher amount of special education studies and longer teaching experience. Students in this particular group were significantly older than the students in other groups. Emphasising assessment of learning reflects more traditional conceptions that have also been linked to long teaching experience and an unwillingness to develop one's own work (Authors, submitted; Maskit 2011). On the other hand, the traditional conceptions of the respondents with longer teaching experience may simply reflect the emphasis of teacher education at the time respondents completed their master's degree. In Finland, the students can qualify as special needs teachers while simultaneously completing their master's degree or later as additional studies. Most of the students in this group had prior teacher qualification. Teacher education curricula and curricula in theoretical special education studies are regularly updated, and today's curricula are likely to treat assessment differently than, for example, ten or twenty years ago. Traditional conceptions may also reflect concrete assessment-related circumstances in Finnish schools. In the Finnish educational policy system, municipalities, schools, and teachers have a relatively broad autonomy in interpreting the law and national guidelines. This results in very individual and different, sometimes traditional, ways of conducting assessments and supporting students' learning processes.

Assessment is centrally linked to the special education teachers' profession (Takala et al. 2018). Thus, supporting the development of good assessment skills is an essential part of special needs teacher education. Our results show that pre-service special education teachers represent different assessment conceptions that are differently related to official educational policy, which poses challenges for special needs teacher education. Our results are in line with those of Brown (2008), which suggest, based on cluster analysis, that teacher conception types differ in terms of how they emphasise assessment for learning and assessment of learning. While the Assessment Positives represent conceptions that are closest to assessment for teaching and learning and national educational policy, conceptions of the Assessment Cautious are more traditional, with an emphasis on assessment of learning. The Assessment Criticals, however, saw assessment as a harmful action rather than a tool to assess and/or support learning, and thus stood out from the other groups.

This study suggests that without theoretical knowledge or teaching experience, pre-service special education teachers' own experiences of being assessed may direct assessment conceptions, and these are not necessarily in line with policy-level objectives. As in this study, the conceptions may thus become very critical, which is a challenge for special education teacher education, considering that the studies should support the development of assessment skills that support teaching and learning. Positive conceptions, however, are related to stronger up-to-date theoretical knowledge. On the other hand, theoretical knowledge without much

practical experience may also result in unrealistically positive or uncritical views of assessment. Long practical teaching experience can support the development of conceptions that are not in line with policy-level objectives if the experience is gained in the environment with very traditional assessment practices.

Some limitations of this study should be acknowledged. We used a self-report measure to assess assessment conceptions and used that as a basis for the assessment profiles. Although the developed questionnaire showed good internal reliability in our study and might be considered the easiest type of instrument to be implemented among pre-service special needs teachers, future studies could combine it with methods that show how these conceptions concretise assessment practices, such as video-recordings and inter-rated observation sheets. Even though assessment conceptions underlie assessment practice (Hill and Evers 2016), theoretical awareness and practice are not always in concordance with one another (Deneen et al. 2019; Siegel and Wissehr 2011). The present investigation was based on participant motivation. Therefore, the generalisability of the results and reservations on assessment conceptions of those who decided not to participate may be considered an issue. However, as we found as much as three clearly distinct student types, the results are purposeful. Finally, as this study employed a cross-sectional design, longitudinal designs taking into account the observed quality of instruction or classroom interaction as predictors of assessment profiles could be useful in future studies.

## Conclusion

Despite the above limitations, the current study does indeed extend to prior knowledge by providing information about assessment conceptions of pre-service special education teachers, who, as respective representatives of a separate professional group, have not been investigated before. Since previous studies have shown that assessment conceptions are dependent on societal and cultural practices and policies (Brown and Remesal 2012; Brown et al. 2011), investigating different teacher groups in different cultural contexts is important to strengthen the theoretical basis of assessment conceptions. This study has practical implications for special needs teacher education by providing information for curriculum work. Since assessment conceptions are an integral part of assessment skills, studies should be planned to support identifying and reflecting on one's own conceptions. Furthermore, this study shows that relative to national guidelines, students with different assessment conceptions have very different starting points for professional growth during studies. The starting points may affect how willing students are to shape their own conceptions (Xu and Brown 2016), which guides how the student's practical assessment skills develop. Thus, similar learning methods do not necessarily support assessment-related professional growth amongst all students. Since assessment should be a natural part of the everyday work of special education teachers and closely linked to pedagogical practices and support, it should also be a pervasive part of university curricula in special needs teacher training and be closely linked to all courses and practical periods, not just separate assessment courses.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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