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Measures of Individual, Collaborative and Environmental Characteristics predict Swiss School Principals', Teachers' and Student Teachers' Attitudes Towards Inclusive Education

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Abstract: Positive attitudes towards inclusion of children with special educational needs (SEN) are essential for a successful implementation of inclusive education. This study aimed to test a research model comprising a series of variables that are recognized in the scientific literature for influencing attitudes towards inclusion, by means of structural equation modeling. 518 student-teachers, school teachers and principals were involved in a supra-regional online study conducted in a Swiss canton. Variables were attitudes towards inclusion, self-efficacy, attitudes towards interdisciplinary team-teaching, experiences in specific school settings and opinions about school-environment characteristics. These were included in a theory guided structural equation model (SEM). The analyses revealed a good fit to the hypothesized model. Individual self-efficacy, attitudes towards interdisciplinary team-teaching, opinions about school-environment characteristics and practical experiences accounted for 34% of the variance in attitudes towards inclusion of children with SEN. The study allows a deeper insight in construct "attitudes towards inclusion of children with SEN" and a better understanding of the complexity of relations between the variables involved. The findings allow identifying more precisely the constellation of variables and relationships that play a role in predicting attitudes towards inclusion and, thus, are essential for implementing "a school for all".

Keywords: Attitudes, special education needs, inclusive education, self-efficacy, team-teaching.

INTRODUCTION

For a long time, the separated education of students with special educational needs (SEN) described the state of the art of the educational systems in western countries. The Warnock report (Warnock, 1979) in the beginning of the 1980s, the Salamanca-declaration (UNESCO, 1994) in the 1990s, but particularly today's understanding of inclusion as an elaborated concept with a broad argued policy-frame (UNESCO, 2009) have raised awareness concerning adequate educational practices for students with SEN. With this human-rights-based background, amplified by the UN Convention on the Rights of Persons with a

Disability (United Nations, 2006), the movement towards including students with SEN in regular classrooms has become a global trend, also in Switzerland (Kummer Wyss, 2007). Article 24 of the convention specifies a general framework giving all children the basic right to be educated together with their peers in their local school - regardless of ability or disability. A large number of countries have ratified the Convention (e.g. Austria: 2008; Germany: 2009; Switzerland: 2014) and decided to implement a “school for all” (Hinz, Körner, & Niehoff, 2010). Thereby, they agreed fulfilling the convention-related legally binding guidelines towards the conception of inclusive education for students with SEN, by creating inclusive cultures, policies and, last but not least, by developing inclusive educational practices (Booth & Ainscow, 2011).

Throughout the same period, international research has been dealing with the challenge of identifying success factors for inclusion and the successful implementation of inclusive school-systems. Studies have repeatedly shown that the implementation of inclusive education systems depends on the attitudes and convictions of the individual actors involved in the process (e.g. the school principals, regular- and special education teachers, but also student teachers) and that negative attitudes and expectations prove to be significant barriers to the successful implementation of inclusive classroom practices (Avramidis & Norwich, 2002; De Boer, Pijl, & Minnaert, 2011; European Agency for Development in Special Needs Education (EADSNE), 2011).

Traditionally, attitudes research discriminates three separate components in the relatively stable construct of attitudes: cognitive, affective and behavioral components (Bohner & Wänke, 2002; Eagly & Chaiken, 1993). The research literature from the last few decades shows that attitudes towards inclusion frequently have been investigated using a similar constellation of variables, namely 1) variables related directly to personal variables in teachers, 2) variables concerning the students with SEN, and 3) variables covering educational-environment issues (Avramidis & Norwich, 2002).

VARIABLES OF TEACHERS RELATED TO TEACHER’S ATTITUDES

Studies from various countries and continents, concerning personal variables, show that initial and continued teacher education, focusing on both inclusion and practical experiences in inclusive education on the other, play pivotal roles for the genesis of positive attitudes towards the inclusion of students with SEN (Avramidis & Kalyva, 2007; Dlugosch, 2014).

General and special needs teachers in primary education in Austria do not seem to differ in their attitudes towards inclusion (Gebhardt et al., 2011). Recently, Schwab and Seifert (2015) further showed that student teachers (from different educational establishments) generally have positive attitudes towards the inclusion of students with SEN. Differences between student teachers were only found in the sense that those aiming elementary-school were less positive towards the inclusion of pupils with physical handicaps than students from other branches. Furthermore, study-accompanying inclusion-focused contents seem to lead to more positive attitudes (Kopp, 2009; Kraska & Boyle, 2014). A gradual change in attitudes towards inclusion, i.e. becoming less positive, was observed for student teachers advancing in their training years (Costello, 2013). Apparently, this tendency continues in school, since several studies evidenced that less experienced teachers showed more favorable attitudes towards inclusion compared to

more experienced teachers (Avramidis & Norwich, 2002; Center & Ward, 1987; De Boer, Pijl, & Minnaert, 2011). Generally, teacher training focusing at inclusive schooling and experiences in inclusive schools appear important for the genesis of positive attitudes (European Agency for Development in Special Needs Education (EADSNE), 2011; Kurniawati, De Boer, Minnaert, & Mangunsong, 2017; Sharma, Forlin, & Loreman, 2008; Sharma, Loreman, & Forlin, 2012; Vaz et al., 2015) for student teachers (Mansfield & Volet, 2010; Sharma, Forlin, Loreman, & Earle, 2006).

According to two review studies (Avramidis & Norwich, 2002; De Boer et al., 2011) some studies reported that female teachers have more positive attitudes towards inclusion than male teachers while others did not find significant gender differences.

VARIABLES OF STUDENTS RELATED TO TEACHER'S ATTITUDES

Based on their reflections regarding teacher beliefs, i.e. the subjective appraisal of teachers of their responsibility for the support of students with SEN, Jordan, Schwartz, and McGhie-Richmond (2009) assumed that teachers hold different attitudes concerning the needs of individual students with SEN and the disabilities of these students and their inclusion. As mentioned, due to the assignment of students with SEN to special classes or schools, when included in mainstream classes, these students are automatically labelled as "special", even though their effective needs are not yet known (Cloerkes, 2007). Earlier studies already reported that teachers perceive their students according to their assigned class of disability or their "label" (Salvia & Munson, 1986). Center and Ward (1987), Gans (1987) and, more recently, Silverman (2007) conferred that teachers think more positive of the inclusion of those children who can achieve the learning objectives of the class and do not demand any additional competencies or aids. In particular, students with physical and sensory disabilities fulfill these "criteria". Attitudes towards students displaying behavioral problems or aggression are more negative (Gebhardt et al., 2011). In his study, the attitudes of teachers toward the inclusion of students with physical or sensory disabilities were the most positive. These were less positive towards the inclusion of students with learning disabilities or intellectual disability and least positive towards the inclusion of children with emotional or behavioral problems. Recent studies (Forlin & Chambers, 2011; Gal, Schreur, & Engel-Yeger, 2010) confirm these findings. Schwab and Hessels (2015) showed similar results for student teachers.

EDUCATIONAL ENVIRONMENT VARIABLES RELATED TO TEACHER'S ATTITUDES

Attitudes towards inclusion and its implementation are strongly influenced by variables that are associated with school-environmental issues. In this regard it seems confirmed that personal support, such as counselling/devices, support from professionals with a special educational background, prevailing material and immaterial conditions (teaching materials and aids, class size- and composition, school equipment, advanced training) influence the attitudes of teachers. At the same time, the demands of teachers and teacher-teams and the availability of adequate solutions seem to be highly dependent on the specific school context (Center & Ward, 1987; Gal et al., 2010; Giangreco & Doyle, 2007; Villa, Thousand, & Nevin, 2009).

Likewise, organizational innovations like the implementation of inclusion, the adoption of new roles and the accompanying anticipated increase in workload by teachers, are strongly interrelated with the perceived support by and competences of school principals (Center & Ward, 1987; Krause & Dorsemagen, 2007; Kugelmass & Ainscow, 2004).

Research further seems to confirm that the above also counts for the implementation of (specialized) support in inclusion, as well as the interdisciplinary cooperation like co- or team-teaching (Anliker, Lietz, & Thommen, 2008; Bless, 2007; Fattig & Taylor, 2008; Villa et al., 2009).

INDIVIDUAL AND COLLECTIVE SELF-EFFICACY IN TEACHERS

In pursuing the implementation of inclusive education, recently, also the teachers' sense of self-efficacy and their beliefs to be capable and handle the various challenges have become a focus of interest. In this specific domain, too, empirical findings confirm positive associations between high self-efficacy and the readiness and motivation of teachers to implement inclusive instruction, as well as with their attitudes towards inclusive education (Avramidis, Bayliss, & Burden, 2000; Hecht, Niedermair, & Feyerer, 2016; Hellmich & Görel, 2014; Sharma et al., 2012; Tschannen-Moran & Woolfolk Hoy, 2001). Teachers who estimate their self-efficacy in their practice as low tend more to attribute their difficulties to the students and their special educational needs. Furthermore, they seem less willing to adapt their teaching methods. Conversely, teachers with high self-efficacy, who feel competent, also feel more responsible for the needs of children with SEN and seem to attribute difficulties to external issues (Brady & Woolfson, 2008; Cook, Tankersley, Cook, & Landrum, 2000; Jordan, Lindsay, & Stanovich, 1997).

In this context, it should be mentioned that self-efficacy originally was understood as an individual construct. Later, Bandura (1997) enlarged the concept to a collective level for explaining factors beyond the individual perspective. Schmitz and Schwarzer (2002) defined collective self-efficacy as a super-individual belief of behavior-competences from a selected group of professionals, that influences the manner goals are set, strains are invested and resistance will be overcome, if barriers occur when implementing a project. Thus, the construct is defined as a reference for a school-team's sense of effectiveness and group behavior in organizing, managing and applying practices in a new context (Goddard & Goddard, 2001; Tschannen-Moran & Barr, 2004). As a variable that pertains rather to the school-level, collective self-efficacy is not only positively related to individual self-efficacy, motivation and teaching, but also to student's learning outcomes (Gibbs, 2007; Goddard & Goddard, 2001; Jordan, Glenn, & McGhie-Richmond, 2010; Schmitz & Schwarzer, 2002). Urton, Wilbert and Hennemann (Urton & Wilbert, 2014) further showed that collective self-efficacy is related to attitudes towards inclusion, as well as to attitudes related to providing special needs support in class to struggling learners.

ATTITUDES TOWARD INTERDISCIPLINARY TEAM-TEACHING

The implementation of inclusive education innovations and the creation of inclusive practices are related with changes in classroom contexts and changing responsibilities for the professionals involved (Booth & Ainscow, 2011; Lyons, Thompson, & Timmons, 2016). In this context, the interdisciplinary collaboration of general and special needs educators is

considered an essential approach for promoting effective instruction in inclusive classrooms with students with very heterogeneous needs. Especially so-called collaborative teaching or co-teaching gained much popularity in inclusive school practice (Friend, Cook, Hurley-Chamberlain, & Shamberger, 2010; Mastropieri & Scruggs, 2006; Murawski & Swanson, 2001). Kloo and Zigmond (2008) define co-teaching as a “special education service-delivery model in which two certified teachers – one general educator and one special educator – share responsibility for planning, delivering, and evaluating instruction for a diverse group of students, some of whom are students with disabilities” (p. 13). In their meta-analysis, Murawski and Swanson (2001) indicated that attitude towards co-teaching is often cited as an important variable, but that research regarding this topic is lacking. More than ten years later, this has hardly changed and normed and valid instruments for measuring attitudes toward co-teaching are inexistent (Pancsofar & Petroff, 2013, 2016). It should be noted that in English research publications such interdisciplinary collaboration in inclusion is mostly called co-teaching (Friend et al., 2010), whereas in German research publications comparable collaboration-forms are called team-teaching (Kummer Wyss, 2012). Obviously, conceptual definitions are needed when dealing with interdisciplinary settings in inclusion (Abegglen, Schwab, & Hessels, 2017; Murawski & Hughes, 2009). In this study with German-speaking teachers in Switzerland, that also focused on interdisciplinary and teaching-oriented cooperation, we use the term interdisciplinary team-teaching (iTT; Abegglen et al., 2017).

Even though not much research exists regarding iTT, Bergren (1997) already showed that both regular and special education teachers think that students with and without SEN profit in their learning from such interdisciplinary collaboration. Recent research has corroborated these findings (Hang & Rabren, 2009; Pancsofar & Petroff, 2013; Scruggs, Mastropieri, & McDuffie, 2007) and similar results have been reported for student teachers (Baeten & Simons, 2014; Shin, Lee, & McKenna, 2016). The fact that interdisciplinary collaboration is positively connoted and viewed as an efficient and reinforcement-providing method has been discussed in several papers (Hang & Rabren, 2009; Solis, Vaughn, Swanson, & McCulley, 2012).

In sum, research supports the assertion that iTT is important. The implication for teacher training and policy makers is that school educators need to be empowered with adequate skills to be able to invest in effective collaborations (Sharma & Jacobs, 2016). Teacher tandems receiving sufficient opportunities to explore iTT develop more self-confidence, a more positive attitude towards iTT and more confidence in their cooperation skills (Pancsofar & Petroff, 2013). Both, regular and special education teachers describe iTT as an ideal tool for their professional development (Hang & Rabren, 2009; Malinen et al., 2013; Pancsofar & Petroff, 2013; Scruggs et al., 2007). In this regard, Pugach, Blanton, Correa, McLeskey and Langley (Pugach, Blanton, Correa, McLeskey, & Langley, 2009) emphasize that iTT is an adequate entry for inexperienced and/or new team members and that it can positively and deeply affect teachers’ professional socialization and personal development. The latter seems equally true for student teachers (Baeten & Simons, 2016; Shin et al., 2016).

FOCUS OF THE PRESENT STUDY, RESEARCH QUESTIONS AND HYPOTHESES

Summarizing, an abundance of research indicates that a successful implementation of inclusive education (IE) is fundamentally dependent on the professionals' attitudes and convictions towards the inclusion of students with SEN. Thus, it is widely accepted that teacher attitudes, self-efficacy, collaborative self-efficacy as well as attitudes towards iTT have a high impact on the implementation of inclusion policies and practices. Nevertheless, the factors that shape these attitudes are still relatively poorly understood (Vaz et al., 2015). The research literature discussed previously served as the basis for the theoretical model we developed and that is tested in the present study with a Structural Equation Model (SEM). Figure 1 presents the theoretical model displaying all hypothesized relationships. The model describes the influence of experiences in inclusive education on the perception of school environment characteristics, and the influence of these two variables on individual and collaborative self-efficacy, attitudes towards iTT, and finally attitudes towards inclusive education. Direct and indirect effects, via self-efficacy, collaborative self-efficacy and attitudes towards iTT, are expected.

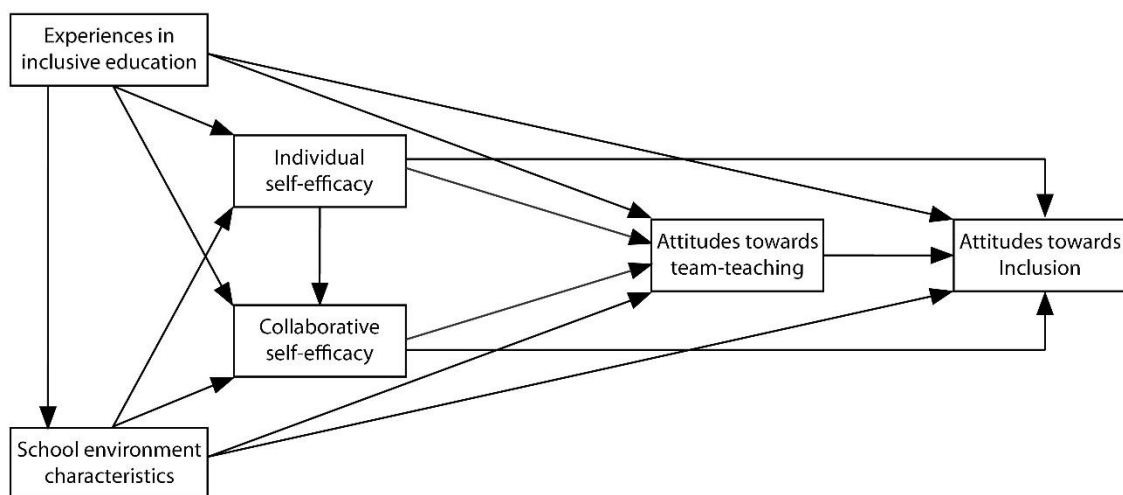


Figure 1. Theoretical model explaining teacher attitudes towards inclusion of children with special educational needs.

The key research questions associated with the theoretical model are:

- 1) How strongly related are (a) individual and collective self-efficacy (b) attitudes towards interdisciplinary team-teaching, (c) school-environmental characteristics and (d) experiences in different settings (inclusive; segregative; as a student-teacher) to attitudes towards the inclusion of children with SEN in regular classes?
- 2) Which of the factors a – d predict student teachers' and school professionals' attitudes towards inclusion of children with SEN in inclusive classes?

We expect that these four variables have a direct effect on attitudes towards inclusion (Hypothesis 1). We further hypothesize that experiences in inclusion, a positive educational-environment and team-teaching, but also higher self-efficacy, are associated with a more positive attitude towards inclusion (Hypothesis 2).

METHOD

Participants

The study reports data obtained by means of a comprehensive online survey in the Swiss canton Berne, where inclusive education was introduced by a canton-wide legislating government policy. The data was obtained from teachers and principals from 32 school teams ($N = 442$), as well as 76 student teachers from an educational training institute for pre- and primary school-level students.

Details on the study's design, recruitment, and data collection have been published elsewhere (Abegglen, Schwab, & Hessels, 2015; Abegglen et al., 2017). To participate in this study, informed consent was obtained from institute management, school principals and teachers. Student teachers were centrally informed and invited to participate in the survey via the institute's administration management. Teachers were centrally informed by the school management. The invitation to the study specifically underlined that. Prospective participants were informed that participation in the study was absolutely voluntary and that they were free to withdraw from the study at any time, without any consequence. Furthermore, the participants were informed that all collected data was anonymous. No personal data (such as date of birth, age), school names or municipal names were recorded. The participants were further assured that all data would be deleted from the server after completion of the survey. Feedback at the end of the survey contained only general suggestions for the interviewees about the success of an inclusive school. Finally, it must be mentioned that at the time of data collection, the Swiss national law on research ethics had not yet been in force. Consequently, no ethical committees existed for psychological-pedagogical research. Of course, we observed all general ethical research standards.

To obtain a representative sample of teachers, a random sample of 45 full-time school principals, i.e. professionals with responsibility for larger school-systems, was contacted and asked for cooperation in the study. Thirty-two school principals participated with their teams. Sixteen of them were responsible for kindergarten- and primary school teams, three for secondary-level-teams and ten were responsible for systems covering all the three school levels (pre-primary, early primary and secondary school levels). Three principals managed small teams of professionals for special education, i.e. speech- and psycho-motor therapy. Data preparation showed that 17 of the participants worked part-time as a principal in smaller departments or systems. These participants were also included as school principals in this study, making a total of 49 principals.

The school principals were sent an invitation mail with a link to the online questionnaire, which they were asked to forward to their teams. A total of 436 of the 796 potential participants completed the questionnaire (return rate 54.8%). This sample (see Table 1) of teachers consists of 323 women (75.9%) and 119 men (24.1%). The gender proportions are similar to those in the population of teachers. We did not ask for the age of the participants, but the number of years of professional experience as a teacher (average teaching experience: $M = 18.9$, $SD = 10.6$).

In Switzerland, the total compulsory school period amounts to eleven years. The primary level includes two years of kindergarten (pre-primary) and six years of primary school. The lower secondary level takes three years. Compulsory education generally sets in for children at the age of four. Student teachers are trained at pedagogical institute of the cantonal university of applied sciences. The students graduate from their teacher training

with a bachelor degree. This bachelor's degree in pre-primary and primary education and the pre-primary and primary school curriculum allows teachers to teach in kindergarten and primary school. Student teachers were invited to participate via the principal of the institute. 123 of the 531 students completed the online questionnaire (return rate 23.2%). Since the planned analyses required participants that were able to weigh school environment characteristics and collective self-efficacy variables, 45 students were removed from the sample because of a lack of practical experience via internships. The final subsample of student teachers consisted of 70 female (92.1%) and 6 male (7.9%) participants (see Table 1). Although it can be assumed that these students had accumulated sufficient experiences in internships, they were not as experienced as fully employed teachers.

Table1. Sample characteristics ($N = 518$).

Observed variable	Group	<i>n</i>	%
Gender	Female teachers	323	75.9
	Male teachers	119	24.1
	Female student teachers	70	92.1
	Male student teachers	6	7.9
Teaching experience	0 year (student teachers)	76	14.7
	1 – 10 years	130	25.1
	11 – 20 years	139	26.8
	> 20 years	173	33.4
Type of employment	Student teachers	76	14.7
	Regular teachers	307	59.3
	Special education professionals ^a	89	17.2
	School principals	49	9.5
Level/type of education ^b	Student teachers	76	14.7
	Pre-Primary education	34	6.6
	Primary education (grade 1 – 3)	108	20.8
	Primary education (grade 4 – 6)	123	23.7
	Secondary (all levels)	91	17.6
	Special education classes	57	11.0
	Special education services	29	5.6
Experience with inclusion systems	School-system with SEN-classes	271	52.3
	Inclusive school-system since one year	19	52.3
	Inclusive school-system more than one year	161	34.7
	Student teachers/no experience ^c	67	12.9

a. Professionals with qualification in special education (special education teachers, speech- and psychomotor-therapists).

b. $n = 49$ school principals included in subsamples.

c. Nine student teachers who had advanced in their practical training chose one of the other three categories.

Measures

Attitudes towards inclusion. In this study, the American “Opinions Relative to Integration of Students with Disabilities” (ORI) (Antonak & Larrivee, 1995) was used to measure the attitudes towards inclusion. This rating scale contains 25 items, 13 positively and 12 negatively worded statements such as “Regular-classroom teachers have sufficient training to teach students with disabilities”. The statements are grouped according to the following four dimensions: 1) Benefits of Integration, 2) Integrated Classroom Management, 3) Perceived Ability to Teach Students with Disabilities und 4) Special Versus Integrated General Education. Together, the dimensions are used for measuring teachers’ general attitudes towards inclusive education. The reported split-half reliability for the original ORI-scale (Spearman-Brown = .82), but also the internal consistency (Cronbach’s α = .88) are high (Antonak & Larrivee, 1995).

For use with (Swiss) German speaking teachers, the scale had to be translated. Some of the terms used in the ORI had to be adapted to the different school characteristics and temporal circumstances in Switzerland. The original 7-point Likert scale, with response categories ranging from -3 (I disagree very much) to +3 (I agree very much) was changed to a 6-point version, leaving out the neutral “neither agree nor disagree”. After a pilot study, leading to some small adjustments, this “ORI-d” was included in the online questionnaire. The ORI-d-scale was used as one general construct, with higher scores indicating more favorable attitudes to inclusion. The internal consistency of ORI-d total score was high (Cronbach’s α = .91) in our sample.

School, teacher and school environment characteristics, and experience in inclusion. The respondents were asked to report details concerning demographic characteristics, education, training and details regarding environmental characteristics of the school. One important part of the online questionnaire was the section in which teachers and students (with advanced internship experiences) had to rate the “readiness” of the school environment characteristics for inclusion (e.g. “How appropriate is the class size in you school to support the children with SEN”). Six items had to be rated with a 4-point Likert version. For those students and/or teachers who were not able to rate the questions, the option “no answer possible” was provided. The internal consistency of this 6-item scale (Cronbach’s α = .78) was quite satisfactory.

In order to assess how much experience the participants already had with inclusion, they were asked to indicate in which kind of system they were engaged (an inclusive system, a segregative system, or still studying). Nine students considered they had sufficient experiences to assess their work place (see Table 1).

Teachers’ appreciation of self-efficacy. The “individual teacher self-efficacy-scale” (Schmitz & Schwarzer, 2002; Schwarzer & Schmitz, 1999) is based on Bandura’s (1997) social-cognitive theory and has been constructed for measuring a teacher’s self-efficacy on the individual level. The instrument addresses four areas of professional activity of individual teachers: (a) general professional performance, (b) job-related social interactions, (c) dealing with stress and emotions, (d) specific self-efficacy towards innovative acting. The rating scale contains ten items, one negatively and nine positively worded statements. The four-point response format ranges from (1) I do not agree to (4) I agree very much. The scale was implemented in a large longitudinal study (Schmitz & Schwarzer, 2000) and the internal consistencies for the two measuring points ranged from

$\alpha = .76$ to $\alpha = .82$ (Schmitz & Schwarzer, 2002). In the current sample, the internal consistency of the scale was also high (Cronbach's $\alpha = .80$).

With the intention to capture both the individual and the collective teacher self-efficacy in a uniform way, the "collective teacher self-efficacy-scale" (Schmitz & Schwarzer, 2002; Schwarzer & Schmitz, 1999) focuses on the teacher as an individual within a group. The respondent is asked to rate the coping skills of his or her reference group (team, teaching staff) from a personal perspective. The instrument comprises 12 positively worded items. The four-point Likert scale (with the same response format as the individual scale) showed a high internal consistency with a Cronbach's α from .90 to .92 (Schmitz & Schwarzer, 2002). For the current sample, internal consistency was high (Cronbach's $\alpha = .83$).

Attitudes towards co-teaching. The "Attitudes towards Interdisciplinary Team-teaching" (AiTT) was developed within the larger framework of this study (Abegglen et al., 2017). The AiTT especially aims to measure the teachers' general disposition for interdisciplinary team-teaching (iTt) during the implementation of inclusion in their school system. The scale addresses the following aspects: (a) benefits of iTt for the individual, (b) benefits of iTt for the class in general and (c) benefits of iTt regarding teaching development in inclusive education. The 4-point Likert response format varies from 1 = "not true" to 4 = "perfectly true". The AiTT showed a very high internal consistency (Cronbach's $\alpha = .96$).

Data analysis

Data was analyzed with Statistical Package for the Social Sciences (SPSS, Version 23) and Analysis of Moment Structures (AMOS, Version 23). The online-survey was constructed to strictly minimize missing data. In this study, only few "missing data" occurred for students or beginning teachers because of their lack of knowledge for rating school environment characteristics and collective teacher self-efficacy-questions. Here we followed the strategy to control and remove participants who chose "no answer possible" list-wise. Following acknowledged guidelines for much less than 5% missing values, we decided not to use the multiple imputation-method, but to replace with subsample mean scores (McKnight, McKnight, Sidani, & José, 2007; Weiber & Mülhhaus, 2014). Independent samples t-tests confirmed that the characteristics of those whose data comprised "no answer possible", responded similarly as those who did respond to all questions. Data was assessed for univariate and multivariate outliers using Z scores $> \pm 3.29$ and Mahalanobis distance, respectively. Multivariate outliers ($n=15$) were removed so that the final sample consists of 518 participants.

To summarize the profiles of study participants, descriptive statistics were used. Two dummy variables were created to represent the categorical independent variable "setting". The dummies were incorporated in the structural equation model. For identifying multi-collinearity in multiple regressions, collinearity diagnostic factors were calculated. In order to obtain an overview of the relationships between the variables examined, a Pearson correlation matrix was calculated. Due to the relatively small sample size on the one hand and the presence of multicollinearity on the other, the structural equation model (SEM) was modeled and estimated as a path-model based on manifest variables in order to avoid incorrect causal interpretation of correlated variables (Weiber & Mülhhaus, 2014). Scale scores were computed as a total averaged score (total score divided by the number of items). The structural equation model (SEM) was estimated using covariance matrix and Maximum Likelihood Estimation, provided in AMOS. Even though these parameter

estimates are robust to departures from normality, we applied the Bollen-Stine (1992) bootstrap procedure because we anticipated that multivariate normality could be violated. The Bollen-Stine bootstrap-p provides a post-hoc adjustment to the chi-square p-value accounting for non-normality of the data and produces appropriate standard errors (Bollen & Stine, 1992).

To verify the global quality of the model, the normalized chi-square value was used. This value should be as low as possible and may vary between 2 and 5. In addition, for testing the acceptance of the model the following indices and associated cut-off values were implemented. The CFI (Comparative Fit Index), NFI (Normed Fit Index), the TLI (Tucker Lewis Index) and the AGFI (Adjusted Goodness of Fit Index) should have values $\geq .9$. The RMSEA (root mean square error of approximation) and the SRMR (Standardized Root Mean Square Residual) should have values $\leq .08$. Following the observation that the normalized chi-square values are very sensitive with larger samples, we also implemented the Hoelter-criterion. It informs about the accepted sample for the model analyzed (Chen, 2007; Hoelter, 1983; Hu & Bentler, 1999; Tabachnick & Fidell, 2013; Weiber & Mülhhaus, 2014). Finally, for calculating significances and confidence intervals for direct, indirect and total-effects, besides the regular bootstrap-based AMOS calculations (Arbuckle, 2014), the SPSS-macro and add-on for statistical mediation, moderation and conditional "Process" (version 2.16) from Hayes (2013) was used.

RESULTS

The descriptive results (means, standard deviations, minimum, maximum, and median) for the investigated constructs and the school-environment characteristics are presented in Table 2.

Table 2. Descriptive statistics (Mean, Standard Deviation, Minimum, Maximum and Median) for all variables.

	<i>M</i>	<i>SD</i>	Min	Max	Md
Attitudes towards inclusion (ORI-d; max = 6)	3.64	0.70	1.52	5.52	3.72
Attitudes towards team-teaching (AiTT; max = 4)	3.54	0.44	2.00	4.00	3.67
Individual self-efficacy (SEind; max = 4)	3.02	0.37	1.80	4.00	3.00
Collective self-efficacy (SEcoll; max = 4)	2.87	0.48	1.58	4.00	2.83
School-environment characteristics (SEC; max = 4)	2.86	0.59	1.00	4.00	2.83
Experiences Dummy 1 (ESett1) ^a	.35	.48	0	1	
Experiences Dummy 2 (ESett2) ^a	.13	.34	0	1	

a. Nominal categories transformed into two dummy-coded variables: ESett1: teachers in inclusion = 1, others = 0; ESett2: Students = 1, others = 0. For both ESett-variables, teachers in separate settings, served as reference-group = 0.

The descriptive statistics show that the attitudes towards inclusion are relatively neutral ($M = 3.64$; $SD = 0.70$) compared to the scale's theoretical (neutral) mean of 3.5. The attitudes of the participants towards co-teaching are very positive and show little variance ($M = 3.54$;

$SD = 0.44$). Similarly, the results for individual self-efficacy ($M = 3.02$; $SD = 0.37$) and collective self-efficacy ($M = 2.87$; $SD = 0.48$), are relatively positive compared to the theoretical mean of 2.5. The same is true for school-environment characteristics ($M = 2.86$; $SD = 0.59$). In sum, the descriptive statistics show relatively positive values for all variables.

As data input for path analysis served a variance-covariance matrix, respectively the correlation matrix of the variables. Table 3 presents a synopsis of the interrelationships between the investigated variables.

Table 3. Correlation-matrix of the six variables.

	1.	2.	3.	4.	5.	6.
1. Attitudes towards inclusion (ORI-d)						
2. Attitudes towards team-teaching (AiTT)	.42**					
3. Individual self-efficacy (individual) (SEind)	.44**	.37**				
4. Collective self-efficacy (SEcoll)	.23**	.24**	.34**			
5. School-environment characteristics (SEC)	.30**	.17**	.25**	.29**		
6. Experiences 1 (ESett1)	.18**	.14**	.07	.15**	.10*	
7. Experiences 2 (ESett2)	.22**	.09*	.16**	-.06	.16**	-.28**

* $p \leq .05$; ** $p \leq .01$

Table 3 shows that attitudes towards inclusion (ORI-d) are moderately related to attitudes towards co-teaching (AiTT; $r = .42$; $p \leq .01$), individual self-efficacy (SEind; $r = .44$; $p \leq .01$) and school-environment characteristics ($r = .30$; $p \leq .01$). The associations between ORI-d and collective self-efficacy (SEcoll; $r = .23$; $p \leq .01$), experiences of teachers in inclusive settings (ESett1; $r = .18$; $p \leq .01$) and those of student teachers (ESett2; $r = .22$; $p \leq .01$) – both groups dummy-coded with “1”, in comparison to ‘others’, coded “0” – are rather small. The respondents’ attitudes towards co-teaching (AiTT) and their individual self-efficacy (SEind) show a moderate correlation ($r = .37$; $p \leq .01$). The associations between AiTT and the collective self-efficacy (SEcoll; $r = .24$; $p \leq .001$), the respondents school-environment characteristics (SEC; $r = .17$; $p \leq .01$) and their experiences in inclusive education ($r = .14$; $p \leq .01$), respectively student setting ($r = .09$; $p \leq .05$) are rather small. The constructs measuring self-efficacy (SEind and SEcoll) show a moderate correlation ($r = .34$; $p \leq .01$). The correlation between SEind and respondents’ evaluation of school-environment characteristics (SEC) is relatively low ($r = .25$; $p \leq .01$). SEind has a low correlation with ESett2 ($r = .16$; $p \leq .05$) and shows no correlation with ESett1 ($r = .07$; *n.s.*). Collective self-efficacy (SEcoll) also shows a low correlation with SEC ($r = .29$; $p \leq .01$) and ESett1 ($r = .15$; $p \leq .05$), and no correlation with ESett2 ($r = -.06$; *n.s.*). The correlations between SEC and both dummies for experience-settings, ESett1 ($r = .10$; $p \leq .05$) and ESett2 ($r = .16$; $p \leq .01$), are small. Finally, no multicollinearity was revealed (Weiber & Mülhhaus, 2014).

A preliminary SEM was estimated with all hypothesized relationships. This step revealed three non-significant paths ($p \geq .05$) and concerned the relationships SEcoll – ORI-d, SEC – AiTT and ESett1 – SEcoll. Figure 2 displays the final model’s standardized estimates indicating the specific interrelations. The non-significant paths ($p \geq .05$) are displayed as

dashed arrows. The SEM shows a good fit to the theoretically hypothesized model ($\chi^2 = 4.52$; $df = 3$; $p = .21$ CMIN/ $df = 1.51$; NFI = .99; CFI = 1.00; TLI = .98; RMSEA = .03, PCLOSE = .64; SRMR = .02). Concerning the empirical to theoretical model-fit, our model fits Homburg and Baumgartner's (Homburg & Baumgartner, 1995) cut-off value CMIN/ $df \leq 2.5$. Furthermore, with values greater than .90 the NFI, CFI and TLI are good (Arbuckle, 2014; Chen, 2007; Weiber & Mülhhaus, 2014). Likewise, the Root Mean Square Error of Approximation (RMSEA = .02) is very good. According to Browne and Cudeck (1993), model-fit with values RMSEA $\leq .05$ can be interpreted as good or "close" (Weiber & Mülhhaus, 2014). Finally, the PCLOSE value indicates the error probability for the null hypothesis RMSEA $\leq .05$. With PCLOSE = .64, the null hypotheses can be accepted.

To standardized estimates of the individual relationships are presented in Figure 2. The analyses show that ORI-d has 34% explained variance. Attitudes of respondents are predicted by their individual self-efficacy (SEind; .27***), their attitudes towards co-teaching (AiTT; .26***), their estimation of school-environment characteristics (.15***) and practical experiences in different settings (dummy ESett1 = .16***, for teachers in inclusive settings, dummy ESett2 = .18***, for students' setting).

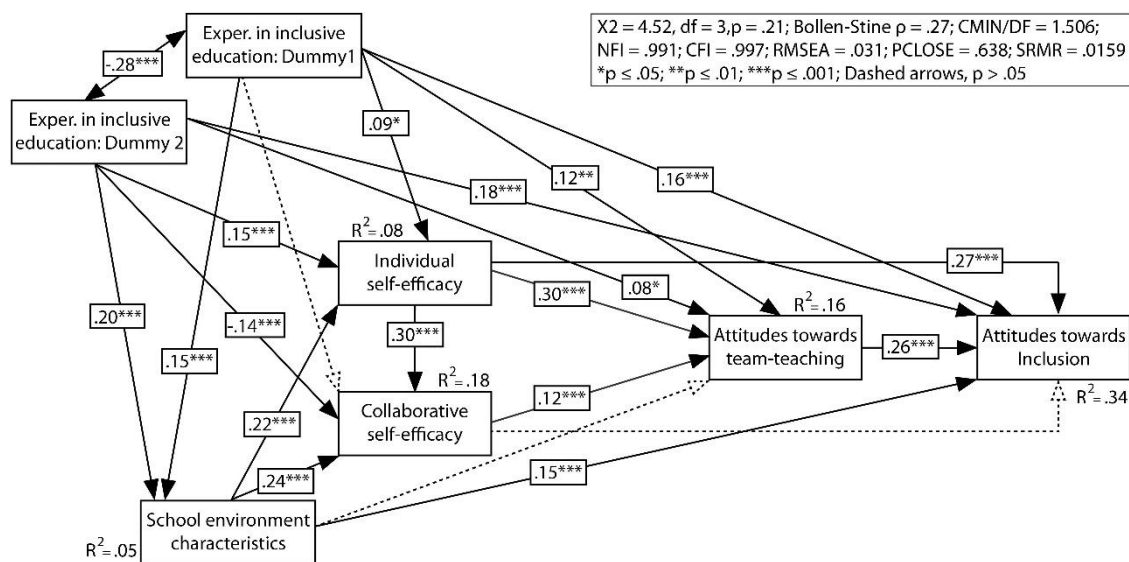


Figure 2. Structural Equation Model explaining teacher attitudes towards inclusion of children with SEN.

Table 4 provides an overview of direct, indirect and total effects. Regarding the standardized indirect (mediated) effects, Table 4 shows that the non-significant effect of collective self-efficacy (SEcoll) on ORI-d is significantly mediated by AiTT ($E_{ind} = .03^{**}$; $E_{total} = .03^{**}$). Individual self-efficacy beliefs of respondents (SEind) on ORI-d are mediated ($E_{ind} = .09^{***}$) by AiTT and SEcoll ($E_{total} = .36^{***}$). Estimations of school-environment characteristics (SEC) ($E_{dir} = .15^{***}$) are mediated ($E_{ind} = .09^{***}$) by associated variables SEcoll, SEind and AiTT ($E_{total} = .23^{***}$). Finally, the effects of experiences in specific settings (ESett 1 & 2) on ORI-d are also substantially mediated over the aforementioned variables:

Table 4. Standardized estimates with direct, indirect and total effects.

	ESett1 ^f			ESett2 ^g			SEC			SEInd			SEcoll			AiT ^h	
	E _{dir}	E _{ind}	E _{total}	E _{dir}	E _{ind}	E _{total}	E _{dir}	E _{ind}	E _{total}	E _{dir}	E _{ind}	E _{total}	E _{dir}	E _{ind}	E _{total}	E _{total/dir}	
ORI-d ^a	.16***	.10***	.26***	.18***	.12***	.30***	.15***	.09***	.23***	.27***	.09***	.36***	-	.03**	.03**	.26***	
AiT ^b	.12**	.05**	.17***	.08*	.05**	.14**	-	.10***	.10***	.30***	.04**	.34***	.12**	-	.12**	-	
SEInd ^c	.09*	.03**	.13**	.15**	.04***	.19***	.22***	-	.22***	-	-	-	-	-	-	-	
SEcoll ^d	-	.07***	.07***	-.14**	.11***	-.04	.24***	.07***	.30***	.30***	-	.30***	-	-	-	-	
SEC ^e	.15**	-	.15**	.20***	-	.20***	-	-	-	-	-	-	-	-	-	-	

a. Attitudes towards inclusion

b. Attitudes towards team-teaching

c. Individual self-efficacy (individual)

d. Collective self-efficacy

e. School-environment characteristics

f. Experiences Dummy1 (setting incl./others)

g. Experiences Dummy2 (setting stud./others)

h. For attitudes towards interdisciplinary team-teaching only one direct effect.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

For teachers in inclusive settings ($E_{ind} = .10^{***}$; $E_{total} = .26^{***}$) by SE_{ind} and $AiTT$ and for students by SE_{ind} , SE_{coll} , and $AiTT$ ($E_{ind} = .12^{***}$; $E_{total} = .30^{***}$).

Regarding the predictive power of the scales, SE_{coll} (.12^{***}) and SE_{ind} (.30^{***}) account for 16% of explained variance in attitudes towards co-teaching ($AiTT$). With an explained variance of 18%, collective self-efficacy (SE_{coll}) is predicted mainly by SE_{ind} (.30^{***}), SEC (.24^{***}) and experiences in student setting ($E_{sett2} = .14^{***}$). SE_{ind} is predicted by SEC (.22^{***}), experiences in inclusive ($E_{sett1} = .09^*$) and student setting ($E_{sett2} = .15^{**}$), resulting in 8% explained variance. Experiences made in inclusive ($E_{sett1} = .15^{**}$) and those from student's perspective ($E_{sett2} = .20^{***}$) account for 5% explained variance in opinions about school-environment-characteristics (SEC).

For regression- and thus for SEM-analyses, categorical variables had to be dummy coded. As a result, (see Fig. 2 and Table 4), we can point out some group differences (research-question three). First, the statistically significant positive path-coefficients of E_{sett1} (.16^{***}) and E_{sett2} (.18^{***}) on ORI-d make apparent that teachers in inclusive settings (E_{sett1}) and students (E_{sett2}) are more positive towards inclusion (ORI-d) than are teachers in segregative settings. Furthermore, these group differences between teachers in inclusive settings respectively students, compared to teachers in separate settings, are also present with SEC , SE_{ind} and $AiTT$ (see Fig 2). Collective self-efficacy (SE_{coll}) also showed that teachers in inclusive settings have higher collective self-efficacy than teachers in separated settings, indirectly mediated over SEC (n.s.) and SE_{ind} (n.s.) ($E_{ind} = .07$; $E_{total} = .07$). Students seem to show a lower collective self-efficacy ($E_{dir} = -.14$). The total negative causal effect ($E_{total} = -.04$) is suppressed by the positive effect ($E_{ind} = .11$) over the indirect mediating variables SE_{ind} ($p < .001$) and SEC ($p < .01$).

DISCUSSION

This study aimed at developing and testing a theoretical model that represents the associations between theoretically relevant variables that influence student teachers' and teachers' attitudes towards inclusion of children with SEN. Included in the model were experiences with inclusion, school environment characteristics, self-efficacy (individually and collectively), and attitudes towards team-teaching and reliable scales that had proved their usefulness were used to measure these variables. The findings of the current study enlarges our insight into the significance of the variables included. The verified German translation of Antonak and Larrivee's (1995) "Opinions Relative to Integration of Students with Disabilities" (ORI-d) was used as the predetermined criterion variable (Abegglen et al., 2015).

The results revealed relatively moderate and neutral attitudes towards inclusion, as is also reported in the research literature (De Boer et al., 2011). Nevertheless, the large variance in responses shows that some respondents are more positive, whereas others are more negative towards inclusion. This contrasts with the very positive attitudes towards interdisciplinary team-teaching, the positive individual self-efficacy, the rather positive sense of collective self-efficacy and the likewise positive opinions regarding school environment characteristics, even though these variables also showed considerable variance. Regarding the first research question, the findings showed that the variables used were moderately and significantly interrelated, justifying further analyses. Our theoretical model was tested with structural equation modeling and revealed a good fit to the empirical

model, as indicated by the appropriate fit-indices. Regarding research question two, the analyses showed that nearly all variables contributed directly to the prediction of the attitudes towards inclusion of children with SEN in inclusive classes (34% of variance explained). The only exception was the construct collective sense of self-efficacy, which showed only an indirect effect via the attitudes towards team-teaching. The important contribution of the latter construct seems to warrant its usefulness. As it seems to cover a specific and conative part of the attitudes towards inclusion, it merits being included in future studies.

In the present research, as was the case in previous studies, individual sense of self-efficacy proved to be a crucial predictor for positive attitudes towards inclusion (Savolainen, Engelbrecht, Nel, & Malinen, 2012; Sharma et al., 2012). Concretely this means that teachers need to feel that they master teaching skills that are required for planning and executing teaching tasks with challenging students. Participants' collective sense of self-efficacy did not directly predict attitudes towards inclusion. However, collective sense of self-efficacy did have an effect on the attitudes towards interdisciplinary team-teaching (AiTT). This finding is congruent with research that illustrated that collective self-efficacy is an important supporting factor on the level of the teaching staff (Jordan et al., 2010; Savolainen et al., 2012; Urton & Wilbert, 2014). Our findings evidenced that a construct like AiTT can serve as a significant component and potential predictor for attitudes towards inclusion - an aspect that is worthwhile investigating in future research.

Besides the positive and significant effect of individual sense of self-efficacy on attitudes towards inclusion, another important issue was confirmed in our current research, namely that experiences in inclusive education play an important role in respondents' attitudes towards inclusion of children with SEN (Gal et al., 2010). The structural equation model further illustrates significant relationships between experiences in inclusive education and (student-)teachers' self-efficacy and attitudes towards interdisciplinary team-teaching, but also with estimations concerning school-environmental characteristics (Avramidis & Norwich, 2002; Jordan et al., 2009). Our study evidences that these mediating variables function as sensitive network in the development of attitudes towards inclusion. Moreover, the presented total effects indicate that particularly personal experiences have a greater impact on attitudes towards inclusion than was thought and that they play an essential role in the prediction of associated variables. These findings emphasize the importance of (student-)teachers' opportunities for developing personal experiences with inclusion and the impact of these experiences on the feeling to be prepared for educating students with SEN in inclusive education (Avramidis & Norwich, 2002; Kurniawati et al., 2017; Vaz et al., 2015). Furthermore, the importance of perceived school-environmental characteristics in predicting individual and collective self-efficacy, as well as general attitudes towards inclusion provides a clear signal. Positive individual and collective self-efficacy, as well as attitudes towards inclusion can be fostered when school-environmental characteristics are favorable, i.e. appropriate room design, class-size and heterogeneity, support for internships (for student teachers), supervision for in-service teachers, basic- and continued education, and support from school management (Baeten & Simons, 2014; Gal et al., 2010; Kugelmass & Ainscow, 2004).

Like other research, we found that student teachers and teachers working in inclusive settings exhibit a more positive attitude towards inclusion than teachers working in segregative settings. Understandably, experienced teachers working in segregative settings show a higher sense of collective self-efficacy compared to student teachers, but lower

compared to teachers working in inclusive settings (Urton & Wilbert, 2014). The reason that student teachers and teachers in inclusive settings feel more self-efficient than teachers in segregative settings may be related to the positive effects of specific experiences in inclusive teaching (Savolainen et al., 2012) and a too positive appraisal by student teachers because a lack of (sometimes challenging) practical experiences. Concerning the focused genesis of positive attitudes towards inclusion, Gibbs (2007) evokes the importance of a synergy between the teacher's perception of his/her individual and collective sense of self-efficacy. Our SEM shows that a significant relationship exists between these two constructs and confirms their role as direct and mediating predictors. Moreover, our finding shows that both teachers working in inclusive settings and student teachers are more positive towards school-environmental aspects and interdisciplinary team-teaching than professionals working in segregated settings. This result confirms once more the positive effect of contacts and experiences with inclusive settings on attitudes towards inclusion and on the willingness of implementing inclusive education (Kyriacou, Avramidis, Høie, Stephens, & Hultgren, 2007).

LIMITATIONS AND FUTURE DIRECTIONS

There is a broad consensus that teachers' attitudes towards inclusion are crucial for successfully implementing inclusive education as a "school for all". The SEM generally confirmed our theoretical model with its hypothesized causal relations. It represents a first basic model that reliably predicts attitudes towards the inclusion of students with SEN, both for experienced and student teachers. With its systemic conception, the model allows greater understanding of and a more concrete insight in the complexity of the genesis of "inclusive attitudes". Moreover, we believe that the theoretical model may serve as useful starting point for future (and necessary) studies aiming at better understanding how attitudes towards inclusive education develop and how these could be fostered when implementing inclusive education. For qualitative studies, or preferably mixed-methods-research, our model could serve as a "pathfinder" concerning the conception of guided interviews or to evaluate investigated information. In the same line, we also think that our model may represent a step towards a reflexive practice, as it could be used as a guide to consult, to understand and to balance the implementation process or supervision of teams that are in the process of creating inclusive settings and practices.

Finally, we have to mention some limitations of our study. First, our sample included a wide range of respondents, including of student teachers with little or vast internship experiences, as well as teachers and principals from 32 school teams from a Swiss canton with a very heterogenous structure. Therefore, our study was deliberately focused on cross-sectional, cross-cultural and cross-discipline data. Even though the idea behind the project was to create a reliable model that explains and predicts our finding (for teachers from a large range of disciplines or inclusive teams-to-be), the model and causalities should not be generalized blindly. Of course, from a methodological point of view, the analyses revealed consistent findings, but differently modelled conceptions or constellations of variables and relationships could prove valid. Moreover, we did not differentiate specific models for subgroups of respondents based on gender, age, years of experience, or other aspects that have often been used in inclusive education research. The model could be expanded with such variables in replication studies with large samples. We neither investigated specific

factors beyond the classroom or variables concerning the (dis-)abilities of the children taught and that might have given an even closer view of how attitudes of beginning and experienced teachers develop. These could also be the focus of future studies. Finally, our study suggests that the genesis of attitudes towards inclusion of children with SEN should perhaps be understood as an inclusive and systemic network process, as personal and environmental factors seem to be interwoven.

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