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ARTICLES

Know How to Teach Me . . . Evaluating the Effects of an In-Service Training Program for Regular School Teachers Toward Inclusive Education

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Teachers are seen as key players in implementing inclusive education. However, extremely little attention has been paid to teacher preparation, particularly in India. The aim of the current study was to implement a teacher training program and evaluate its effects and appropriateness. This focused on increasing teachers' (a) attitudes, (b) knowledge about four types of special educational needs (i.e., attention deficit and hyperactivity disorder [ADHD], dyslexia, intellectual disability, and autistic spectrum disorder [ASD]), and (c) teaching methods. In a pre–posttest study, the effects of the training program were evaluated ($n_{\text{experimental group}}=38$, $n_{\text{control group}}=41$). A questionnaire package was administered before and after the implementation of the training program. Outcomes of the ANCOVA revealed that the teachers in the experimental group had significantly more positive attitudes and had increased their knowledge about dyslexia, intellectual disability, ASD, and teaching methods. Moreover, teachers evaluated the training program as relevant and appropriate. The practical implications of the results are discussed in terms of teacher preparation and the implementation of inclusive education.

Keywords: Inclusion, attitudes, knowledge, disabilities, teaching methods, teacher training, professional development

INTRODUCTION

Inclusive education for students with disabilities was one of the new Millennium Development Goals (United Nations, 2000). This particular goal defines concrete educational objectives based on international policy statements such as

the Salamanca Statement, Framework for Action on Special Needs Education (United Nations Educational Scientific and Cultural Organisation [UNESCO], 1994), and the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD, 2006). It is a rights-based approach that underscores the discussions about implementing inclusive education for students with disabilities.

Many countries follow the trend toward inclusive education (Srivastava, De Boer, & Pijl, 2015), among which is India, where this rights-based approach has also been introduced. Legislation and educational policies have

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been steadily emphasizing this approach for almost two decades now. In this context, the Persons with Disabilities Act (PWD) Act of 1995 was a landmark, followed by others like *Sarva Shiksha Abhiyan* (SSA, Education For All Movement in English) in 2001; Action Plan for Inclusive Education of Children and Youth with Disabilities in 2005 and the Right to Education Act in 2010 (Ministry of Social Justice and Empowerment [MHRD], 2010). In India, the term *disabilities* is used interchangeably with *special educational needs* (SEN; Hodkinson & Devarakonda, 2009; Singal, 2005). Although on a policy level much progress has been made in the last few years, the practical aspects of implementation are barely visible.

Teachers play a pivotal role in implementing inclusive education (Ahmmed, Sharma, & Deppler, 2012; Oswald & Swart, 2011). Several studies have indicated important aspects with respect to teachers in inclusive education, such as their attitude (Avramidis, Bayliss, & Burden, 2000; Ross-Hill, 2009), knowledge about the characteristics of students, their learning style (Bishop & Boag, 2006; Croft, 2010), and knowledge about teaching methods (Rix, Hall, Nind, Sheehy, & Wearmouth, 2009). In other words, teachers' attitude, their knowledge about disabilities, and their knowledge about teaching methods are important for including students with disabilities in regular schools.

A substantial body of research has investigated the above three aspects and suggests that teachers' attitudes are neutral or undecided (De Boer, Pijl & Minnaert, 2011; Parasuram, 2006), and that they lack knowledge about different types of disability like dyslexia (Carvalhais & Da Silva, 2010), attention deficit hyperactivity disorder (ADHD; Ghanizadeh, Bahredar, & Moeini, 2006) and autistic spectrum disorders (ASD; McCabe, 2008). Moreover, teachers possess inadequate knowledge about specific teaching methods pertaining to a disability (Leach & Duffy, 2009). Overall these studies express teachers' concern about their inadequate preparedness to include such students in their classroom. While teachers' concerns might be justified in certain circumstances or situations, Rouse (2008) suggests reconsidering the role and responsibilities of teachers from three aspects, namely believing, knowing, and doing. These aspects appear similar to attitudes, knowledge about disability, and knowledge about teaching methods. Florian (2008) explains them as having a triangular relationship, as any two of these aspects influences the third. This means that if a teacher "believes" in the rights-based approach toward inclusive education and is willing to try to include students with disabilities ("doing"), then the teacher's knowledge about inclusive practices will develop. Likewise, another teacher believing in the principle of inclusion may lack confidence in "doing," but by learning about inclusive practice develops the knowledge ("knowing"), giving him or her the confidence to engage in inclusive practices. Similarly, teachers may know about inclusive practice but still be unsure about whether they believe in it, but by working in a

school that has an inclusive ethos ("doing"), they see the practice can be effective ("believing"; Florian, 2008). While looking at the implementation of inclusive education from this perspective, the question arises: How should teachers be facilitated in developing their attitudes, knowledge, and teaching methods? The current study focuses on preparing regular teachers in developing their attitudes, knowledge about disabilities, and knowledge about teaching methods.

Theoretical Background

Attitudes toward inclusive education

Eagly and Chaiken (1993) defined attitudes as comprising three distinguishable components toward an object: cognitive, affective, and behavioral. The cognitive component refers to the beliefs about a concept or object. In the case of inclusive education, it could be the belief that "students with a disability should be in regular schools." The affective component refers to the feelings toward a situation. For inclusive education, it might be the feeling that a student with a disability will disrupt the entire class. The behavioral component refers to the intention to act in a certain way. In the case of regular teachers' behavior, this could be their willingness to adapt instruction or the curriculum for a student with a disability. Based on an investigation of 26 studies on the three components of attitude, the study of De Boer, Pijl, and Minnaert (2011) showed that regular school teachers held negative or neutral attitudes toward inclusion. In addition, they concluded that teachers do not feel competent and confident in teaching students with disabilities. Furthermore, they investigated the influence of variables like gender, years of teaching experience, experience with inclusive education, and training on the attitudes of teachers. They found that women teachers being more supportive than their male colleagues, having less teaching experience, previous experience with inclusive education, and training in special needs education were all variables that significantly influenced a more positive attitude toward inclusion.

Knowledge about disabilities

Obviously, it would be difficult for teachers to teach students with disabilities without having any knowledge about it. Allday, Neilsen-Gatti, and Hudson (2013) identified knowledge about the characteristics of students with disabilities as a basic teacher requirement toward the goal of inclusion. It was also recommended by the teachers in the study by Idol (2006). A number of studies that focused on teachers' knowledge about disabilities such as ADHD (Ghanizadeh et al., 2006; Vereb & DiPerna, 2004), specific or general learning disabilities (Kirby, Davies, & Bryant, 2005), dyslexia (Carvalhais & Da Silva, 2010), intellectual disabilities, and ASD (McCabe, 2008), found that in each case the teachers lacked knowledge. These authors also suggested that the knowledge about disabilities would be helpful in employing relevant teaching methods that might

be both specific and effective. The current study focused on teacher's knowledge about four "invisible" disabilities in India, commonly occurring in regular primary classrooms (ADHD, dyslexia, intellectual disability, and ASD). The reason for focusing on these is that due to the normal-looking physical appearance of children with such disabilities, they have special education needs about which teachers can be unaware. Consequently, in regular classrooms they are either overlooked from the educational objectives or wind up in special education. It is argued that both situations should be avoided.

Knowledge about teaching methods

The literature suggested that to include students with disabilities in regular classrooms, teachers need to be aware of appropriate teaching methods (Allday, Neilsen-Gatti, & Hudson, 2013; Burstein, Sears, Wilcoxon, Cabello, & Spagna, 2004; Edwards, Carr, & Siegel, 2006). Moreover, certain teaching methods are specific to a certain disability such as dyslexia (Carvalho & Da Silva, 2010) or ASD (Goodman & Williams, 2007; McCabe, 2008). Therefore, teachers need to be aware of the common difficulties of students with disabilities and the relevant teaching methods appropriate to a particular situation. Florian (2006) categorized teaching methods for an inclusive teacher under the headings: differentiated instruction (e.g., different paces of instruction), cooperative learning (e.g., peer tutoring), and classroom management (e.g., modified seating plan). Florian (2006) described these methods as "inclusive teaching methods" as they would benefit all students in the regular classroom. Since preparing teachers for inclusion is the objective of the current study, knowledge about these teaching methods fits well in the theoretical framework.

Rationale for Development of an In-Service Training Program

The current study focuses on the implementation of an in-service training program and aims to influence teachers' attitudes, knowledge about disabilities, and knowledge about teaching methods. To promote positive attitudes and increase knowledge, several studies recorded the impact of teacher education and teacher training programs on attitude and knowledge (Carroll, Forlin, & Jobling, 2003; Florian, 2009; Nash & Norwich, 2010; Sharma, Forlin, & Loreman, 2008). Studies have also aimed at increasing knowledge about various special needs and teaching methods (see Forlin & Chambers, 2011; Leblanc, Richardson & Burns, 2009; Rae, McKenzie, & Murray, 2011). Overall, these studies reported a significant increase in the knowledge of participants about disabilities and knowledge about teaching methods after the training programs. Thus, an in-service training program seemed to have a tremendous potential in preparing teachers for inclusive education. Unfortunately,

however, not every in-service training program has been evaluated properly in terms of its effects.

In the context of India, the education of students with disabilities in the past decades has been provided in special schools (Hodkinson & Devarakonda, 2009). However, the Indian legislation and educational policies have been evolving at a rapid pace from the last few years, which are in line with the international trends toward inclusive education. Inclusion of children with disabilities in regular education was started under the movement of SSA (Education for All), which has increased its pace with the introduction of the Right to Education Act 2010 (Ministry of Human Resource Development [MHRD], 2010). The legislation mandates all schools to include students with disabilities in regular education. Consequently, students with disabilities have started attending regular schools. The percentage of students with disabilities present in regular schools has been increasing in the past years.¹ However, implementation of policies requires preparation. Students with disabilities have started attending the regular school but teachers are hardly prepared to manage their special educational needs. Literature about inclusive education in India hardly reports about teachers' preparedness or attempts toward their preparation. A study conducted to measure the attitudes of regular teachers toward inclusive education and their knowledge about disabilities and teaching methods found that teachers held neutral attitudes toward inclusive education and sparse knowledge about disabilities (Srivastava, De Boer, & Pijl, 2015). The study concluded that teachers feel insufficiently prepared to manage the special educational needs of the students with disabilities and require knowledge about disabilities and knowledge about teaching methods.

In India, available teacher training and in-service programs do not really prepare teachers for inclusive education. Moreover, the country has a shortfall of approximately 140,000 special teachers (Institute of Applied Manpower Research [IAMR], 2009, cited in Singh, 2012). With regard to the available teacher training, studies by Gafoor and Asraf (2009) and Sharma, Moore, and Sonawane (2009) evaluated the appropriateness of available preservice teacher education programs and found rather disappointing results. The authors concluded that teachers held negative attitudes and were insufficiently prepared in practical aspects of inclusion even after following these programs. The in-service teacher training in India is mainly provided by the government and local institutes. Despite government provision to orientate primary school teachers toward inclusive education, its efforts remain insufficient. Short training programs on inclusive education, ranging

1. In 2012–2013, 1.18% of students with disabilities were in schools, while in 2013–2014 it was 1.26% (District Information System for Education [DISE], 2014).

from between one and seven days, seem not always sufficient (Kumar & Kumar, 2007; Singal, 2009). Besides this, there is a serious lack of empirical evaluation of the effects (Singal, 2009). Local institutes offering training to teachers at a few state schools are mainly tailor-made for certain ones. Designed for an individual school, they thus vary in duration, content, or method to meet its specific requirements. Furthermore, the effects remain obscure. There is not much information available regarding the preservice teacher training, in-service teacher training programs, and bridge courses, which are the institutes involved in preparing teachers for inclusive education in India. Even though there has been recurring need for knowledge about disabilities and knowledge about teaching methods expressed by the teachers in a small body of literature in India, hardly any studies have been performed to address these needs. The current study focuses on developing an in-service training program and evaluating its effects for regular teachers to include students with disabilities in their class. It focuses on increasing positive attitudes, knowledge about disabilities, and knowledge about teaching methods as important aspects of preparing teachers for inclusive education. The study uses the term SEN (Special Education Needs) when referring to the target group, and aims to answer the following two research questions:

1. What is the short-term effect of an in-service training program for regular primary schoolteachers' attitudes toward inclusive education, knowledge about SEN, and knowledge about teaching methods?
2. How do regular schoolteachers evaluate the appropriateness of an in-service training program in terms of its content and preparation toward inclusive education?

Outline of the In-Service Training Program

The training program presented in the current study focused on the most commonly occurring special needs in India's regular classrooms, namely: (a) attention deficit hyperactivity disorder (ADHD), (b) dyslexia, (c) intellectual disability, and (d) autistic spectrum disorder (ASD). The content of the training program included information about the rights-based approach toward inclusive education, plus various Indian legislations endorsing this type of schooling, and the facts about four types of special needs and teaching methods. It was anticipated that information about the rights-based approach and recent legislation, such as the Right to Education Act, and policies promoting inclusion would bring a change in attitude. Information about the four types of special needs included their characteristics and behavior manifestations in the classroom. Knowledge about teaching methods included specific and inclusive teaching methods

that could be used for not only special needs teaching but for the class as a whole, like differentiated instruction.

The training program was given on four continuous working days. Content and information on included topics were presented using PowerPoint and video clips. At the end of each day, the participants recapitulated the information received in small groups and then presented the recap to the entire group. The underlying aim of this interactive activity was to help participants retain the information. Table 1 presents a summary of the training program.

Content validity of the training program

Prior to the implementation of the training, its content validity was evaluated by a panel of four experts, comprising teacher trainers with expertise on inclusive and special education who were closely associated with regular schools that had students with the four types of special needs. They were asked to comment on the objectives of the training program, its overall duration, and length of each session plus content of the training and its relevance and method of training. In general, the panel agreed to the training objectives, duration, content, and its relevance to the training objectives. However, they suggested a visit to a special school, discussing case studies of students from the classroom of the participants, and including group work in preparing teaching material, which could be used after the training in class. Based on the recommendations, changes were made to the program.

Implementation of the training program

The 30-hour training was given by trainers with experience of inclusive education across four days in 2.5-hour sessions. A handbook was provided at the beginning of the training program, which the participants could use in their daily practice. On the last day, real-life case studies were provided to the teachers and discussed in small groups.

METHOD

Research Design

The study had a pre–posttest control group design to ascertain the effects of the in-service training provided to regular school teachers in Jaipur, India. A convenience sampling method was used to assign control or experimental group, depending on the school principals' consent to depute the teachers as participants for the training program. In doing so, we were aware about the possible differences in the two groups. The effect of the training was evaluated by a self-reported questionnaire package and focused on three outcome variables: attitudes toward inclusive education, knowledge about the four types of SEN, and knowledge about teaching methods. The questionnaire was adminis-

TABLE 1
Summary of the In-Service Training Program

	Topic	Method
Day 1	<ul style="list-style-type: none"> → Inclusion as a human right: Legislative and social aspects → Overview of disability in India, Rajasthan → Inclusion: Removing barriers 	PowerPoint presentation, interactive lectures, discussion
Day 2	<ul style="list-style-type: none"> → Dyslexia: A broad perspective → Dyslexia: Specific learning difficulties → Overview: ADHD,¹ difficulties and needs → ADHD: Specific teaching skills → Overview: Intellectual disability → Intellectual disability: Specific teaching skills → Comorbidity of the conditions 	PowerPoint presentation, interactive lectures, discussion
Day 3	<ul style="list-style-type: none"> → Visit to a special school → Dyslexia: Specific teaching skills in classrooms 	<p>Interaction with the students with disabilities and special teachers followed by discussion</p> <p>PowerPoint presentation, demonstration of phonic exercises, interactive lecture</p>
Day 4	<ul style="list-style-type: none"> → Understanding ASD²: Understanding needs of students with social and communication difficulties in class → ASD: Specific teaching skills → Becoming an inclusive teacher → Creating an inclusive environment using inclusive pedagogic approaches → Conclusion and feedback 	<p>PowerPoint presentation, interactive lectures, video clips, demonstrating various visual schedules for ASD</p> <p>Group work</p> <p>Group presentation</p>

Note. ¹ ADHD = attention deficit hyperactivity disorder; ² ASD = autistic spectrum disorder.

tered before and after the training program in the experimental group and also given in the same week to teachers in the control group.

Procedure

The total sample of the study comprised 79 regular primary school teachers from Jaipur, India. Participants were selected in both groups from schools based on the following criteria: (a) schools did not have experience of special needs education or had a specialist teacher, (b) followed the common curriculum,² that is, the CBSE curriculum, (c) did not have students with SEN with a formal diagnosis, and (d) were within the 20–25 kilometer catchment area for practical commuting reasons.

Twenty-five schools were contacted to participate in the study. The school principals were contacted for their willingness to send teachers on the training program. If they were, they were requested to send four or five teachers to participate. Ten schools agreed to complete the questionnaires but not participate in the training program. The teachers who completed questionnaires from those schools comprised our control group. Fifteen schools agreed to send between two and four teachers for the training. These teachers comprised our experimental group. A questionnaire was

administered before and after training to the experimental group and also in the same week to the control group.

Participants

Forty-nine participants in the control group completed the questionnaire before the training and 41 after the training. Only questionnaires completed at both times were considered for the analysis, resulting in a total sample of 41 teachers in the control group. With regard to the experimental group, 40 teachers were present for 2–3 days and 38 attended the entire training program. Therefore, questionnaires from participants attending the entire training program were considered in the final analysis, resulting in a total sample of 38. Thus, the final database of the participants in the study comprised 79 regular primary school teachers. The majority of the participants were from the 31–40 age group ($n = 45$), had 5–9 years of teaching experience ($n = 27$), and had no students with perceived challenging behavior in class ($n = 53$). Using chi-square analysis, we did not find any statistical differences in the distribution of the background variables per condition. Detailed information about the participants is given in Table 2.

Measures

To measure the effects of the training program on the three outcome variables (i.e., attitudes, knowledge about four types of SEN, and knowledge about the teaching methods),

2. In India, three main kinds of curriculum are followed across the country: Indian Certificate for Secondary education (ICSE), Central Board of Secondary Education (CBSE) and Secondary School Certificate (SSC), which is the curriculum of different states.

TABLE 2
Information of the Background Variables of Control and Experimental Group Based on Posttest Measurement

		Total	Experimental group	Control group
		(N = 79)	(N = 38)	(N = 41)
Demographics ¹		N (%)	N (%)	N (%)
Gender	Male	–	–	–
	Female	79 (100)	38 (100)	41 (100)
Age	21–30 years	14 (18)	9 (22)	5 (12)
	31–40 years	45 (57)	17 (44)	28 (68)
	> 40 years	20 (25)	12 (31)	8 (19)
Teaching experience	1–4 years	21 (27)	8 (21)	13 (31)
	5–9 years	27 (34)	12 (32)	15 (36)
	10–14 years	18 (23)	9 (24)	22 (22)
	> 14 years	13 (17)	9 (24)	4 (10)
Students with perceived challenging behaviors in the class	Yes	23 (29)	13 (34)	10 (24)
	No	53 (68)	23 (60)	30 (73)

Note. ¹ Due to missing values of demographics, the number does not correspond to the sample size.

a questionnaire package was administered to the teachers. The questionnaire had five sections: (a) some general questions regarding background information of the participants, (b) attitude statements toward inclusive education, (c) knowledge about four types of SEN, (d) statements to assess knowledge about teaching methods, and (e) teachers' evaluation of the training program.

The scale for measuring attitude was an adapted version of the Multidimensional Attitudes Toward Inclusive Education Scale (MATIES) originally developed by Mahat (2008). The adapted scale had 19 items with a 5-point Likert rating showing an appropriate reliability coefficient (.81). Answering options ranged from "strongly disagree" to "strongly agree," in which a higher score reflected more positive attitudes. Mahat performed a detailed confirmatory factor analysis of the three components of the original scale. The author reported that the three components were correlated and all items showed factor loadings greater than 0.5 (see Mahat, 2008, for further details).

The scale for measuring knowledge about SEN and knowledge about teaching methods was carefully designed and evaluated in one of our previous studies (Srivastava, De Boer & Pijl, *resubmitted*). The scale consists of four vignettes describing the characteristics of ADHD, dyslexia, intellectual disability, and ASD based on the characteristics described in the ICD-10 (World Health Organization [WHO], 2010; see Appendix 1). The vignettes were followed by statements per SEN type with answers given on a 4-point Likert rating scale (1 = strongly disagree to 4 = strongly agree), with a higher score reflecting more knowledge. The reliability coefficients for the subscale regarding ADHD were .79, dyslexia .70, intellectual disability .78, and ASD .82 (see Table 3). Next to statements, a question required participants to identify the type of SEN based on the vignette description (e.g., Participant K. displays the characteristics of ADHD/dyslexia/intellectual disability/ASD).

The fourth section contained 24 items measuring knowledge about teaching methods. This section was based on a list developed by Florian (2006) and carefully evaluated in one of our previous studies (Srivastava, De Boer & Pijl, *resubmitted*). The items focused on teaching methods like differentiated instruction, classroom management, and cooperative learning. Teachers were asked to indicate their familiarity with the teaching method by means of a 3-point Likert scale (1 = familiar to 3 = unfamiliar), with a higher score reflecting more knowledge about the teaching methods. The reliability coefficient of the scale was .93.

In order to answer the second research question, the fifth section included open-ended questions to evaluate the appropriateness of the training program (e.g., "Please describe which topics covered in the training should have more information"). An overview of the complete questionnaire package is presented in Table 3.

Analyses

In order to answer the research questions, we first recoded negatively formulated statements. Second, we calculated mean scores of the participants. All analyses were conducted using SPSS 22.

We conducted analysis of covariance (ANCOVA) to answer the first research question. By means of this analysis, individual differences in pretest scores are taken into account, which makes it the most appropriate analysis in this kind of study. In the analysis, posttest scores of attitudes were included as dependent variable. Condition (i.e., experimental and control group) was included as the between-subjects factor, and we controlled for the pretest scores in the analysis. Moreover, other relevant background variables (see Table 1) were also included as covariates. We applied the same procedure for analyzing the effects of the training program on knowledge about SEN and knowledge about teaching

TABLE 3
An Overview of the Reliability Coefficient for Three Scales and their Subscales of the Questionnaire Package

Scale	Sub(scale)	Reliability coefficient
Attitude	Total ($n = 19$) Cognitive: I believe that students with disability should be taught in special schools. Affective: e.g., I feel frustrated when I have difficulty communicating with a student with disability. Behavioral: I am willing to adapt the curriculum to meet the individual needs of all students.	.81
Knowledge about SEN ¹	ADHD ² ($n = 11$) e.g., S. has no difficulty in organizing his tasks.	.79
	Dyslexia ($n = 7$) e.g., A. has good reading comprehension.	.70
	ID ³ ($n = 8$) e.g., The curriculum could be modified for K.	.78
	ASD ⁴ ($n = 9$) e.g. P. sometimes interrupts activities with an irrelevant topic.	.82
Knowledge about teaching methods	Total ($n = 24$) e.g., Give supplemental instructions /peer-tutoring/vary group composition for various kinds of activities/modify seating	.93

Note. ¹ SEN = special educational needs; ² ADHD = attention deficit hyperactivity disorder; ³ ID = intellectual disability; ⁴ ASD = autistic spectrum of disorder.

methods. In all analyses, a p -value of 0.05 was used to establish significant effects. We also used partial eta square as an indicator of the effect size, with effect sizes of .02, .13, and .26 indicating a small, medium, and large effect (Cohen, 1992). With regard to the identification of four types of SEN presented in vignette, the percentage of correct answers were counted and presented per condition on pre- and posttest.

The second research question was answered based on the responses of teachers to open-ended questions (e.g., "Please describe which methods used in the training were appropriate"). The responses were analyzed using the themes of duration of the training program, content (e.g., relevance of topics; which topics require more/less information), methods used in the training, and usefulness of the information.

RESULTS

Effects of the Training Program on Attitudes, Knowledge About SEN, and Knowledge About Teaching Methods

Attitude

Descriptive statistics showed that the mean scores of the experimental group increased after the training. The mean scores of the control group did not increase (see Table 4). Analyzing the effects of the training on teachers' attitude revealed a significant difference between the two groups on attitude, $F(1, 76) = 36.66, p < .00, \eta^2 = .33$. None of the background variables showed either a main effect or an interaction effect on teachers' attitude.

Knowledge about SEN

Descriptive statistics showed an increase in the mean scores of teachers in the experimental group regarding knowledge

about dyslexia, intellectual disability, and ASD. The ANCOVA results showed a significance difference between the two groups on knowledge about dyslexia, $F(1, 76) = 15.15, p < .00, \eta^2 = .17$, intellectual disability, $F(1, 76) = 10.72, p < .00, \eta^2 = .12$, and ASD, $F(1, 76) = 41.53, p < .00, \eta^2 = .35$. For dyslexia and intellectual disability it was found that none of the background variables showed a main effect. However, an interaction effect was found between condition and age for knowledge about ASD, $F(2, 72) = 3.77, p < .02, \eta^2 = .09$. Outcomes revealed that participants between 31 and 40 years old in the control group significantly differ from their counterparts in the experimental group. None of the other background variables showed any main or interaction effects.

TABLE 4
Descriptive Statistics per Dependent Variables on Pre- and Posttest for Both Conditions

Outcome variables	Condition	Pretest		Posttest	
		M	SD	M	SD
Attitude	CG ⁴	3.42	.49	3.36	.48
	EG ⁵	3.62	.40	3.93	.34
Knowledge about ADHD ¹	CG	3.09	.36	3.09	.38
	EG	3.15	.31	3.22	.34
Knowledge about dyslexia	CG	2.84	.41	2.85	.39
	EG	2.82	.34	3.05	.38
Knowledge about ID ²	CG	2.96	.26	2.96	.25
	EG	3.08	.30	3.21	.38
Knowledge about ASD ³	CG	2.82	.33	2.80	.34
	EG	2.75	.36	3.17	.37
Knowledge about teaching methods	CG	2.25	.57	2.05	.59
	EG	2.11	.46	2.77	.35

Note. ¹ ADHD = attention deficit hyperactivity disorder; ² ID = intellectual disability; ³ ASD = autistic spectrum disorder; ⁴ CG = control group; ⁵ EG = experimental group.

The descriptive statistics for knowledge about ADHD showed much less increase in the means scores of the experimental group, while no change in the mean scores was found in the control group (see Table 4). While ANCOVA revealed no main effect of the condition, $F(1,76) = 1.31$, $p > .26$, $\eta^2 = .01$, the background variable years of teaching experience did show an effect on knowledge about ADHD, $F(3,70) = 2.79$, $p < .04$, $\eta^2 = .11$. Tukey's post-hoc test result revealed that participants with 5–9 years of teaching experience showed less knowledge about ADHD. No effect or interaction effect of the other background variables was found.

Knowledge about teaching methods

Descriptive statistics showed an increase in the mean scores of the experimental group (see Table 4). The results of the ANCOVA showed a significant difference between the two groups on teaching methods, $F(1,76) = 88.93$, $p < .00$, $\eta^2 = .54$. None of the background variables showed either a main or an interaction effect.

Identification of the SEN as Described in Vignettes

An analysis of identifying the vignettes correctly by the participant in both conditions showed that, overall, the control group had more difficulties in this. Both groups had least difficulties in identifying ADHD correctly on posttest (57%_{control} versus 92%_{experimental}), and most difficulties in identifying an intellectual disability correctly on posttest (10%_{control} versus 55%_{experimental}). The percentage of correct identification increased in the experimental group on posttest for all four disability types. However, least increase was found on ADHD, which is in line with the nonsignificant outcomes of the ANCOVA for ADHD. More detailed results of correct identification of the vignettes can be found in Table 5.

Teachers' Evaluation of the Training Program

With regard to the second research question, the result showed that, overall, the participating teachers described the training program as "very useful and informative." The

participants showed their satisfaction with the training program under the following themes.

Duration of the training

They found the overall length of the training and sessions covering each topic appropriate. For example, the teachers found the duration of the two sessions on dyslexia and ASD, which gave an overview about their characteristics, behavioral symptoms, and difficulties for the student, to be just right.

Content of the training

The topics covered during the training were found relevant and provided enough information on the types of SEN and teaching methods. However, three participants suggested having more information on intellectual disabilities.

Methods used in the training

The PowerPoint presentations, the small-group discussions about real-life case-studies in identifying the SEN, and the teaching methods were found very useful, as was a visit to a special school. The latter was generally described by participants as an "eye-opener" with regard to special needs education and diversity of the classroom. The teachers commented that the specific teaching aids (number lines, picture cards) could be used for certain students in their classes.

Usefulness of the information

The participants described the information gained during the training program on the four types of SEN as being much awaited and desired. They expressly stated having identified such students both in their own classroom and others as well. Furthermore, the teachers had had their queries clarified regarding certain reasons for particular behaviors or underperformance of children in class. It was suggested that such training programs or workshops should be conducted regularly in future.

TABLE 5
Comparison of Percentages of Correct Answers on Pre- and Posttest per Condition

	ADHD ¹		Dyslexia		ID ²		ASD ³	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Control group	67%	57%	45%	35%	12%	10%	22%	18%
Exp. group	82%	92%	45%	90%	33%	55%	40%	90%

Note. ¹ ADHD = attention deficit hyperactivity disorder; ² ID = intellectual disability; ³ ASD = autistic spectrum disorder.

DISCUSSION

In the current study, we examined the short-term effect of an in-service training program on the attitudes of Indian regular school teachers toward inclusive education with regard to their knowledge about four SEN types and knowledge about teaching method. Moreover, we evaluated the appropriateness of the training program as judged by the teachers who participated in the study.

In India, teachers have received very little attention in preparing and empowering themselves in their attitude toward inclusive education, knowledge about SEN, and knowledge about teaching methods. To overcome this shortcoming, we developed a short in-service training program focusing on these three important aspects and measured its effects. The program was developed based on available literature and carefully implemented. It is argued here that well-planned, short in-service training has the potential to be effective. In addition, the belief while developing the training program was to empower teachers so that they could see themselves as an agent of change in the process of inclusion (Ashby, 2012).

The effects of the training program are encouraging for all of its three outcome measures, namely attitudes, knowledge about four types of SEN, and knowledge about teaching methods. Overall, medium to large effect sizes were found ranging from .12 to .54. Regarding teachers' attitude toward inclusive education, positive effects of the training were found. This confirms the findings elsewhere (see Leblanc, Richardson, & Burns, 2009; Sari, 2007). The result suggests that despite initial neutral attitudes in both groups, the experimental one became more positive as opposed to the control group. Surprisingly, in our study we did not find any effect of the background variables on attitudes such as age or years of experience as reported by others (Alghazo & Naggar Gaad, 2004; Avramidis et al., 2000; Parasuram, 2006). This finding could have two explanations. Firstly, the variable of gender could not be considered, as participants in our study were all females; secondly, they were deputed by their schools, which voluntarily agreed to participate in the study. Therefore, it might be that the schools selected motivated teachers to participate in the training, which would then help them all as a core group to take concrete action in daily practice.

We did find participants describing and discussing their visit to a special school as an important and relevant part of the training program. It provided them with firsthand interaction with SEN students. This linked with the Contact Theory of Allport (1954), which suggests that personal contact with persons reduces prejudice. In addition, our finding is in line with the study of Parasuram (2006), also conducted in India (Mumbai). The author reports that the regular school teachers were more positive in their attitudes when they had previous contact with persons with disability. This suggests that the content of our training program, whereby there is an opportunity for interaction with SEN students, has the

potential of making regular teachers more positive. This opportunity could be included in future training programs, in the form of a visit to a special school or testimonies from SEN students about their achievements.

The current study measured teachers' knowledge about four types of SEN that commonly occur in regular classrooms. The results of our effect study are encouraging as teachers' knowledge about three types of SEN show a significant increase (see Table 4). These results are in line with the findings of Leblanc et al. (2009), Rae et al. (2011), and Sari (2007). With regard to knowledge about ADHD, although quantitative measures did not show a statistically significant increase, the experimental group identified the description of the vignette more correctly and less incorrectly at posttest, compared to the control group. This outcome indicates also that teachers' knowledge about ADHD increased in some way.

We realize that providing knowledge about SEN to the regular teachers poses dangers, such as increasing the labeling of students or overidentifying behavior with SEN. We emphasize, however, that our training program did not contain components of the standardized or formal assessment of these SEN. In order to avoid the danger of overdiagnosis, the core belief repeated in the entire duration of the training was that every child is able to learn. It is argued here that knowledge about certain characteristics of students in class helps teachers to employ the required strategies. Therefore, instead of formal assessments, one of the foci of the training program was helping teachers to see themselves as agents for change in schools. It is felt that knowledge about SEN and knowledge about teaching methods are the tools necessary to make that happen. It is envisioned through this training program that those students with SEN who are supported appropriately in regular education will not end up in special schools or in no school at all.

The significant increase in knowledge about teaching methods is the strongest and biggest effect amongst all outcome variables ($ES = .54$). Similar findings are reported in the studies of Edwards et al. (2006), Leblanc et al. (2009), and Sari (2007). It is an encouraging finding, which could have two practical implications from the teachers' perspective. Firstly, even after knowing about the types of SEN, their question remains how to address it in the classroom. Secondly, this knowledge might increase their confidence, reduce their stress while coping with diversity, and teach them it is the most important aspect of daily practice.

The study has limitations in terms of generalizing the results. Firstly, the study is based on a limited geographical area of India, so results might be different for other locations. Secondly, teachers in the experimental group participated voluntarily. Moreover, the study used a convenience sampling method, that is, the participants in the experimental group were deputed by their principals. Hence, it may be that they were motivated to change and gain knowledge. Also, as principals selected and deputed the participants, they might have expected participants to gain knowledge from the

training program, impart it to their colleagues, and apply it in their daily practices. A mix of participants being both more and less motivated is recommended in future research.

Despite the limitations, the results of this study have several implications. First, in India hardly any studies have been performed in which an in-service teacher training program was developed and measured for its effects. Second, hardly any study has been performed in which participants evaluated the appropriateness of the training program. The current study bridges this gap greatly and could be replicated elsewhere in India as well as in other countries when aiming to prepare teachers for inclusive education. The training program reported in this study is of added value, as it has shown itself to be effective.

The results of the study lead to interesting further research directions. The training program in its present form has ingredients (attitudes, knowledge about SEN, and knowledge about teaching methods) in equipping regular teachers to take action in the classroom. For further research, it would be interesting to explore how this knowledge is applied in daily practice. Moreover, it would be interesting to examine the effects of in-service training programs on student outcomes like increase in social participation and academic achievements. Lastly, it would be interesting to explore how much knowledge received during an in-service training program is retained by the participants over a longer period. Showing long-term effects would contribute to the development of professional programs.

CONCLUSION

The present study had two aims. The first was to examine the short-term effect of an in-service training program on the attitudes of regular schoolteachers toward inclusive education, their knowledge about four SEN types, and their knowledge about teaching methods. The second aim was to evaluate the appropriateness of the training program as judged by the teachers who participated in the study. Based on the outcomes, it can be concluded that, overall, the training was very effective. It can be concluded that promoting teachers' attitude toward inclusive education increased significantly. Furthermore, out of four types of SEN, teachers' knowledge increased significantly about dyslexia, intellectual disability, and ASD. No increase in knowledge about ADHD was found. Knowledge about teaching methods also increased significantly. With regard to the second aim of the study, teachers who participated in the study indicated finding the training program appropriate and relevant for their daily practice.

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APPENDIX 1

EXAMPLE OF A VIGNETTE USED IN THE QUESTIONNAIRE

Vignette About a Student With Dyslexia

Amit is a boy eight years old. During reading he has difficulty in finding the page and text. He seems lost while

reading and jumps frequently from one word to another. He cannot remember spellings and often jumbles up the sequence of words. While reading, he very often reverses letters and adds letters or words or substitutes words with others. He hesitates to read and has a slow reading speed. He does not answer questions based on a text he has just read. His performance in exams is poor. He likes to play outside, enjoys swimming, and swims fast. During group teaching, he appears to daydream, although he has good comprehension skills. Amit also has good role-play skills and is a friendly and cheerful boy.