



Effects of inclusion on students with and without special educational needs reviewed

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ABSTRACT

In many countries, education policies are shifting towards inclusive education. Human rights have always been an important argument for this development, but the effects on students should be an important factor when designing policies. In this review, therefore, literature on the effects of inclusion on both students with and without special educational needs is described. The review covers not only effects on cognitive development, but also socio-emotional effects. In general, the results show neutral to positive effects of inclusive education. The academic achievement of students with and without special educational needs seems to be comparable to non-inclusive classes or even better in inclusive classes. However, there may be some differential effects for high- and low-achieving students without special educational needs. Regarding social effects, children with special educational needs seem to have a less favourable social position than children without special educational needs.

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'Those with special educational needs must have access to regular schools which should accommodate them within a child-centred pedagogy capable of meeting these needs.

Regular schools with this inclusive orientation are the most effective means of combating discriminatory attitudes, creating welcoming communities, building an inclusive society and achieving education for all; moreover, they provide the efficiency and ultimately the cost-effectiveness of the entire education system.' (Articles 2.4 and 2.5, The Salamanca Statement, UNESCO, 1994)

1. Introduction

In 1994, these articles from the Salamanca Statement were adopted by representatives of 92 countries at a UNESCO conference in Salamanca, Spain. According to Ainscow and César (2006), this statement is the most significant international document that has ever appeared in the field of special education. The Salamanca Statement explicitly endorses the idea of inclusive education, as the quotations above show. Inclusive education can be defined as educating children with special educational needs in regular schools, instead of in special schools. To put it another way: 'inclusion involves keeping special education students in regular classrooms, and bringing support services to the child rather than bringing the child to support services' (Smelter, Rasch, & Yudewitz, 1994).

In line with the Salamanca Statement, the overall international trend is towards more inclusive education (Ainscow & César, 2006; Meijer, 2004; Smeets, 2007). However, there are major differences between countries in the policies on inclusive

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education. In Europe, for example, there are large differences between the numbers of students in special education. In the period 2002–2004, 0.4% of Spanish and Norwegian students were educated in special settings. In the same period, 4.9% of Flemish and 4.8% of German students were educated in special schools (Smeets, 2007). Furthermore, there are major differences in the kind of special educational needs of children educated in special education settings. In some countries, like Denmark, there are only one or two types of special education. In other countries, like the Netherlands, there are more than 10 (Meijer, 2004). Within inclusive education, there are also differences: children can be included in regular classes all day, or children can be taught separately for part of the day (e.g. Markussen, 2004; Wiener & Tardif, 2004).

Despite the differences between countries and practices, the trend towards inclusive education still holds. Farrell (2000) makes some interesting remarks on this trend. He states that there are two types of arguments in favour of inclusive education: socio-political and empirical. The socio-political arguments mostly state that inclusion is a matter of human rights: children with special educational needs have the right to be educated in regular schools. Farrell (2000) describes some problems with this line of argument. First, he states that the most important right of children is to have good education, even if this means special education for some students. Second, he states that rights can conflict: parents might feel their child has a right to be educated in a regular school, while the child might objectively be better off in a special school. Furthermore, other children have a right to good education as well: placing a child with special educational needs in a regular class might have a negative effect on the other pupils. Finally, Farrell (2000) states that there is a right to choose: if special education is abolished, parents will be denied any choice, as a special school will no longer be an option. Because of these problems, the empirical arguments are very important: policy decisions should have regard for the effects on students.

Farrell (2000) describes some results of earlier research into inclusive education. However, his descriptions are rather short and the studies he describes are now quite dated. Nevertheless, for policy on inclusive education, it is very important to know the empirical evidence on the effects of inclusion for both regular students and students with special educational needs. Only then will decisions on inclusive education be mainly based on evidence instead of the ideals in the human rights debate. In the light of the discussion on evidence-based education, this would be a very important shift of focus. A problem with this approach, however, is that it requires comparing students with different types of special educational needs in different countries, which might lead to over-generalized conclusions. While it would be better to have a specific focus on the effects of inclusion of a particular group of students in one specific context, this is practically not feasible. There is often too little research to draw evidence-based conclusions for a specific country. Using research results of other countries is then a second-best solution. While it is obviously impossible to predict something about the effects of inclusion on one particular student in one particular context, this international approach makes it possible to infer the general outcome trends of inclusive education.

Already, there have been a number of international reviews on the effects of inclusive education. Many of these earlier reviews focused on children with severe special educational needs (e.g. Nakken & Pijl, 2002; Pijl, Nakken, & Mand, 2003). Less has been written on the effect of including children with mild to moderate special educational needs. Nevertheless, this group is the biggest group of children with special needs; they will be the ones who will be included in the greatest numbers and the first to be included. Two recent reviews by Lindsay (2007) and by Kalambouka, Farrell, Dyson, and Kaplan (2007) investigated the effects of inclusion of children with mild special educational needs, but neither drew explicit conclusions on the effects of including this group. Furthermore, Lindsay (2007) focused only on the effects of inclusion on the children with special educational needs, while Kalambouka et al. (2007) just focused on the effects on the children without special educational needs. In this review, we try to give a comprehensive overview of the recent literature on the academic and socio-emotional effects of including children with mild to moderate special educational needs on both the regular students and the students with special educational needs. Theoretical issues relating to these topics will be elaborated in the introductions to the respective parts of this review.

2. Method

To get an overview of the academic and socio-emotional effects of inclusive education on both regular students and students with special educational needs, we searched recent international scientific literature on this topic. For this, three electronic databases were used: PsychInfo, ERIC and Google Scholar. We used terms such as 'inclusion,' 'inclusive education' and 'special educational needs' combined with terms such as 'achievement,' 'socio-emotional' and 'effects.' After that, references within articles were used to find more studies. Only articles published in the last decade (since 1999) were included in this review. Because of the limited number of studies a meta-analysis was not an option, so we confined ourselves to a review with summaries of each study.

In selecting articles, scientific quality was the most important criterion. First, studies were selected based on the presence of a control group or a pre-test/post-test design and a substantial number of subjects. Earlier reviews with a thorough selection of studies were included in this review. However, in the field of inclusive education, much of the research is qualitative; only a limited number of studies have investigated the effects on larger groups of students. To be able to draw substantive conclusions on the effects of inclusive education, smaller scale studies which used a control group or a pre-test/post-test design were included as well when few large-scale studies were available. To make clear what kind of study is described, the methodology is mentioned in the description of each study.

Studies on children with severe special educational needs, including physical disabilities, were excluded. In our definition, mild to moderate disabilities included children with mild to moderate learning disabilities, children with mild to moder-

ate behavioural difficulties and children with mild to moderate psychosocial difficulties. Unfortunately, as Lindsay (2007) describes clearly, the terminology used to describe children with special educational needs is inconsistent. Terminology varies over time, between countries and between practitioners. It is not always clear, therefore, which group of students with special educational needs is being investigated. Furthermore, studies differ considerably in the amount of information given about their subjects. In some studies, it is not completely clear whether students with mild, moderate or severe special educational needs were included. This is why we used the authors' descriptions of their subjects in our descriptions of the studies. Studies in which several groups of students with special educational needs are investigated were included as well, though in describing these studies, we only address the results on the groups of children we wanted to study. Therefore, some studies are only partly described. Despite these efforts on including a homogenous group of students with SEN, there are still differences in the population of students included in this review. In some studies, children with learning disabilities or low-achieving students are investigated, while in others, children with behavioural problems are investigated. Besides, there can also be large differences within groups of children with one certain type of SEN. The reader should keep this in mind when reading this review. To be as clear as possible on the group of students investigated in a single study, authors' descriptions of children with special educational needs will be used when elaborating on their studies and the term 'children with special educational needs' will be used in the conclusions and for general remarks.

The results are divided into four sections. In the first section, the effect of inclusive education on the achievement of children with special educational needs is described. In the second, the socio-emotional development of these children is described. After that, there are two sections on the effects of inclusive education on children without special educational needs. For readability, each section is divided into four subsections. In these subsections, the different studies are classified by whether they found positive, negative or mixed or undecided results of inclusive education. The fourth subsection presents conclusions on each topic. The label 'positive' indicates that the academic or socio-emotional outcomes of students with or without special educational needs are positively influenced by inclusive education; the label 'negative' indicates the opposite. When studies reported no significant effects or mixed effects, they were classified as finding 'mixed or undecided' results.

In some cases, like reviews, it was difficult to decide whether the study should be classified as finding either 'positive or 'negative' results or 'mixed or undecided' results. Because reviews nearly de facto report mixed findings, the general conclusions were used to classify it. Further, some of the subsections only contain a small number of studies. This is because in some sections, studies mostly yield similar results, and in others, only little research is available. Because of this, we considered to only structure the review based on the four topic sections, but for readability, we decided to structure the sections on findings as well.

3. Achievement of students with special educational needs

In order to draw conclusions about the desirability of inclusive education, it is important to know the effects on the academic achievement of children with special educational needs. Theoretically, there might be positive and negative effects: children with special educational needs might achieve better results, because they can learn from more able students. Besides that, they could become more motivated to achieve, because there might be more focus on academic achievement and academic progress in regular education (Cole, Waldron, & Majd, 2004; Myklebust, 2007). On the other hand, children with special educational needs might become less motivated and self-confident when they compare themselves to their peers, because they are likely to achieve less well than their peers without special educational needs. This might adversely affect their motivation and self-confidence. Furthermore, there might be less knowledge about teaching children with special educational needs in regular schools, which might have a negative effect on the quality of their education and their achievement (Cole et al., 2004; Myklebust, 2007).

3.1. Positive findings

Salend and Garrick Duhaney (1999) reviewed nine articles on the effect of inclusive education on the academic achievement of students with disabilities. Most studies they describe report that placement in inclusion programmes results in improved educational outcomes for students with disabilities. One study, for example, found that 71 students with learning disabilities in inclusive settings showed greater gains in reading than 73 students with resource room services. No difference was found for mathematics (Waldron & McLeskey, 1998; cited in Salend & Garrick Duhaney, 1999). In another study, Marston (1996) investigated 240 students with learning disorders in three different settings. He found that 36 students with special educational needs in a combined setting of special and inclusive education had significantly greater gains in reading performance than 33 students in completely inclusive and 171 students in completely special education. Salend and Garrick Duhaney (1999) described some earlier reviews as well. These reviews conclude that inclusive programmes can be effective, but that evidence does not indicate that complete inclusion is superior to special education for children with mild disabilities.

Karsten, Peetsma, Roeleveld, and Vergeer (2001) and Peetsma, Vergeer, Roeleveld, and Karsten (2001) found similar results. Karsten et al. (2001) used a large Dutch cohort-study to investigate whether children with learning and behavioural difficulties or mild mental retardation are better off in special education compared to regular schools. They compared the academic and psychosocial functioning of over 400 matched pairs of students in special and regular education. After 2 years, there were few differences between children in regular schools and the paired children in special schools. In both regular and special schools, the number of students whose academic and psychosocial functioning improved was about the same as the

number of students whose functioning deteriorated. There were some indications that at-risk children in regular education made more progress in mathematics than children in special education.

Peetsma et al. (2001) developed this comparison of children in regular and special education somewhat further. Children in special and regular education were matched in 2nd grade and were followed for 4 years. After 2 years, the results were mixed: some children developed better in regular education, while others developed better in special education. On average, children in regular education achieved somewhat better on mathematics than children in special schools for learning and behavioural difficulties. This difference was not found for children at special schools for mild mental retardation. After 4 years, the differences were greater. Students in regular education scored better at language and mathematics than children in special education.

Finally, Peetsma et al. (2001) investigated the development of 34 students who appeared to have much in common at age 7 or 8, but had developed differently at the later measurements. They found that children who scored better at language and mathematics, functioned better at psychosocial measures as well. For students who achieved less well, there was no clear pattern. Problems at home seemed to have a negative effect on some students, but had a stimulating effect on others. However, children with both psychosocial problems and cognitive problems seemed to develop less well than children with cognitive problems only. Children with problems in both domains developed somewhat better in special education than in regular education.

Jepma (2003) investigated the development of children with learning and behavioural difficulties or mild mental retardation using a similar method. He states that the Dutch policy *Weer Samen Naar School* ('Back to School Together Again') created an overlap between children in special and regular primary education. Some children are referred to special education, while others are educated in regular education. To investigate the development of both groups of pupils, he matched students in regular and special education on cognitive and non-cognitive factors. Jepma (2003) also used Dutch cohort data for his research. He found a matched pair for 55% of the children in special education. The other children may have had problems that were too severe for them to be educated in regular schools.

Five hundred pairs were compared on different measures: language, maths and socio-emotional functioning. Language and maths were measured by achievement tests, socio-emotional functioning was measured by a questionnaire completed by the teacher. Jepma (2003) found that students with special educational needs in regular education made more progress in language and maths. This difference was found both for children with learning and behavioural difficulties and for children with mild mental retardation. Jepma (2003) found no difference in behavioural development and the development of nonverbal IQ scores between children in special and regular education.

Markussen (2004) investigated the development of a group of 777 students with relatively mild special educational needs at upper secondary school in Norway. He administered questionnaires and was given access to the school files of participating students. Students with psychosocial or emotional problems and students with general or complex learning difficulties were less likely to succeed in upper secondary education than other students with special educational needs. Besides that, the better the grade from lower secondary school, the higher the chance of succeeding at upper secondary school. Students receiving special education in regular classes proved to have a better chance of succeeding in upper secondary education than students receiving special education in special classes. However, these groups might have been different at the start of upper secondary education.

The use of segregated arrangements in inclusive education, such as personal tuition or group education for students with special educational needs in ordinary classes, did not seem to have a positive effect on success in upper secondary education. An increase in the amount of special education provided in regular classes even seemed to have a negative effect on the chance of success in secondary education.

Myklebust (2007) also investigated the effect of inclusive education in Norwegian upper secondary education. He investigated the development of 494 students with special educational needs such as general learning difficulties, specific difficulties with reading, writing and arithmetic and mild psychosocial problems. After correcting for relevant background variables, he found a positive effect of inclusive education on competence attainment: students receiving additional support in inclusive classes were 76% more likely to obtain formal qualifications than students receiving education in special classes. Students who achieved better at the start of upper secondary education were also more likely to obtain a formal qualification.

Myklebust (2007) also found a difference between boys and girls: for girls, inclusive education seemed to have more positive effects than for boys. When boys were analysed separately, there appeared to be no differences between inclusive and special education settings. Girls achieved much better in inclusive settings. However, as was the case in other studies on inclusive education, there were more boys with special educational needs in this study. Another unknown is whether the boys and girls had similar types of special educational needs.

Finally, Lindsay (2007) reviewed the effect of inclusive education on children with special needs and decided that it is difficult to draw conclusions about inclusive education, because there are many different forms of inclusion and many ways of researching it. According to Lindsay (2007), the literature before 2000 does not give clear results. At that time, there was little evidence for the effectiveness of inclusive education. Evidence from earlier meta-analyses generally showed positive, but small, effect sizes for inclusive education, especially for academic achievement.

To investigate more recent literature, Lindsay (2007) examined all publications in the period of 2000–2005 from eight relevant journals. From the 1373 considered papers, 14 reported comparative outcome studies of children with special educational needs in regular education. Special educational needs included mild disabilities, such as learning difficulties and behavioural problems, and more severe disabilities, such as autism spectrum disorder, deafness and Down's syndrome.

Concerning academic achievement, most studies found no differences or found a positive effect of inclusive education. From the eight findings concerning academic achievement, two were positive, three found positive results with some caveats and three studies found neutral results. Some of the articles Lindsay (2007) describes are also described in this review. When only the non-overlapping results are taken into account, one study found positive results, three found positive results with some caveats and one found neutral results.

3.2. Negative findings

Rogers and Thiery (2003) investigated whether American students with learning disabilities performed better in an inclusive setting or in a setting in which they had reading lessons in separate classes. The authors investigated five students with learning disabilities in a class of 17 students. Before the study, students were having their reading lessons in special classes. During the first 6 weeks of the study, students still had reading education in their special classes. After 6 weeks, they stayed in their regular classes for reading. Reading performances were measured before the study, after 6 weeks and after 12 weeks.

The results seemed to show a negative effect of inclusion: four out of five students showed a decrease in performance after their reading lessons were switched to the inclusive setting. One student performed better in inclusive education. The opinion of the students with learning disabilities concurred with these results: 80% of the students with learning disabilities stated that they preferred to attend the special classes. However, this study was very small-scale, and the students were already being taught in an inclusive setting for most of the time before the reading inclusion project.

3.3. Mixed or undecided findings

Cole et al. (2004) investigated the effect of inclusive education on children with learning disabilities and children with mild mental disabilities. They compared inclusive and non-inclusive primary school classes in Indiana (US). In inclusive classes, children with disabilities had reading and mathematics lessons in the general education classrooms. In non-inclusive classes, children with disabilities had these lessons in separate classes. Achievement was measured with a test of reading and mathematics. Data on 429 students with mild disabilities were investigated. Of these, 235 students were being taught in special classes and 194 students in inclusive classes. The analysis showed no differences between the children in inclusive and non-inclusive classes.

3.4. Conclusions

We found several studies into the effects of inclusive education on the academic outcomes of children with mild to moderate special educational needs. Most are descriptive studies and they concern children with mild to moderate learning disabilities, mild mental retardation, mild to moderate behavioural difficulties, and mild psychosocial problems. The majority of these studies found positive or neutral results. Very few studies found adverse effects on the achievement of children with mild special educational needs. This appears to indicate that students with special educational needs achieve better in inclusive settings than in non-inclusive settings. However, some caveats must be pointed out. First, some studies did not use a control group in special education. It is difficult, therefore, to draw conclusions based on these studies: it is unclear whether the effects of inclusive education are more positive than the effects of special education. Second, there are major differences between the different studies in the way inclusion was designed: some investigated the effect of full-inclusion projects; others investigated the effect of inclusion programmes in which children are only included for some lessons during the day. The findings of Markussen (2004) indicate that there might be differences between different kinds of inclusion. It is important, therefore, to keep the design of the studies in mind, when drawing conclusions for policy or practice.

4. Socio-emotional effects on children with special educational needs

An important line of argument on inclusive education concerns the social effects on children with special educational needs. Education in special schools could be detrimental to the self-confidence of these students. They might feel rejected and a failure because they attend special schools. On the other hand, children with special educational needs in inclusive schools will compare themselves more often to children without special educational needs, which might have an adverse effect on their self-confidence (Bakker, Denessen, Bosman, Krijger, & Bouts, 2007). Another factor is that children often have to travel longer distances to go to special schools, which might have an adverse effect on their social contacts in their own neighbourhoods. Integrating children with special educational needs in regular schools is believed to lead to increased opportunities for contact with local children, which might have a positive effect on their social development (Nakken & Pijl, 2002).

The social position of children with special educational needs in inclusive education has been investigated quite often. Some of these studies compare students with special educational needs in inclusive and non-inclusive classes. However, many studies only investigate the social position of children with special educational needs in inclusive education, and do not compare them to similar children in special education. This makes it difficult to draw conclusions about the effect

of inclusion on the social development of children with special educational needs, which is why we included a separate subsection devoted to studies without a control group.

4.1. Positive findings

In a Canadian study, [Wiener and Tardif \(2004\)](#) investigated the differences between children with mild learning disabilities in different forms of special education. They measured social acceptance, number of friends, quality of relationship with the best friend, self-concept, loneliness, depression, social skills and problem behaviour. Children were educated at different schools in different settings. One group of children received in-class support ($N=28$), another received lessons in separate classes for a limited period of time during the day ($N=45$).

Children in more inclusive settings seemed to score better on the different measures than children in special education settings. Children who received lessons in separate classes for a small part of the day were less accepted by peers, had lower self-perceptions of mathematics competence and had higher teacher-rated problem behaviour than children in the more inclusive settings. However, when corrections for multiple testing were applied, many of these differences became insignificant. Furthermore, the schools had chosen to adopt inclusive education, which might have led teachers to a more positive assessment of pupils' functioning in inclusive education.

4.2. Negative findings

[Bakker and Bosman \(2003\)](#) investigated the differences in well-being and peer acceptance of low-achieving primary school children in regular and special education in the Netherlands. They administered questionnaires and sociometric scales to 419 children in regular education and 149 children in special education. Children were divided into four groups based on achievement level: one group of low-achieving students in regular education without additional help; one group of low-achieving students in regular education with additional help; one group of low-achieving students in special education; and one control group with average to high-achieving students in regular education.

Both groups of low-achieving students in regular education proved to have lower self-confidence, poorer relationships with the teacher and classmates, and more negative self-perceptions about their physical appearance than average to high-achieving students in regular education. Their ideas about achievement in sports did not differ significantly. Students in special education proved to have more self-confidence than low-achieving children with additional help in regular education, while children with additional help in regular education were more confident about their achievements in sports. On most scales however, there were no differences between low-achieving students in regular and special education.

On the sociometric questionnaire, there proved to be no difference between the two groups of low-achieving students in regular education. Low-achieving students in special education were assessed more positively than low-achieving children in regular education. Average to high-achieving students were assessed more positively than all groups of low-achieving students.

4.3. Mixed or undecided findings

[Peetsma et al. \(2001\)](#) investigated the socio-emotional development of matched pairs in regular and special education using teacher questionnaires, and they found no clear differences. Two years after the first measurement, children at schools for pupils with mild mental retardation were found to be significantly more motivated than comparable children at regular schools. However, this difference was not repeated after 4 years, when there seemed to be no difference in self-confidence between children in special education and children in regular education.

In a comparable Dutch study, [Jepma \(2003\)](#) investigated the socio-emotional functioning of matched pairs in regular and special education, also using teacher questionnaires. He did not find differences in social behaviour, motivation and self-confidence between students with learning and behavioural difficulties or students with mild mental retardation in regular and special education.

[Mand \(2007\)](#) investigated the social position of children with behavioural problems in regular and special education in Germany. He states that children with behavioural problems are often rejected in inclusive schools, but he wonders whether this rejection only occurs in inclusive settings. [Mand \(2007\)](#) conducted a survey to investigate the social position of children with behavioural problems. Children in regular and special classes were given a sociometric questionnaire. Teachers filled in a questionnaire about background characteristics of pupils and another questionnaire about problem behaviour for the children with behavioural problems. Two hundred and thirty-nine pupils were included in this study. Of these, 144 were in integrated school classes and 95 were in special school classes. In integrated classes, there were 16 students with behavioural problems and in special school classes, there were 35 students with behavioural problems.

The results showed that children with behavioural problems were less popular with other students in both regular and special schools: they were on average less popular, had 'average' status less often and were more often rejected. Apart from that, they were also ignored less often, possibly due to their behaviour. The percentage of rejected pupils differed significantly, the other differences were modest. Furthermore, there proved to be no difference between children with externalizing and children with internalizing problem behaviour, both were equally disliked.

In his review, Lindsay (2007) also investigated social effects of inclusive education on children with special educational needs. Most of these studies found few differences between children in regular education and children in special schools. Of the 16 different findings on the social effect of inclusive education, 2 were positive, 2 were positive with some caveats, 8 showed no differences and 4 studies found negative results. Some of these articles have already been described in this review. When these articles are omitted, there remains one study that found positive results, two that showed positive results with some caveats, six that showed no differences and four studies that found negative results.

4.4. *Studies without a control group in special education*

Nowicky (2003) performed a meta-analysis on the social position of children with learning disabilities in inclusive classes. She searched for studies published in peer-reviewed journals from 1990 onwards. Only studies comparing social skills, acceptance and/or self-perceptions of children with learning disabilities and children without disabilities were included. Nowicky (2003) found 32 studies fitting her inclusion criteria. She distinguished different control groups in regular education. Children with learning disabilities were compared with low-achieving and with average to high-achieving children without special needs. Nowicky (2003) classified studies that do not make a distinction between low and average to high-achieving students as having an average to high-achieving control group.

In the meta-analysis, there proved to be significant effect sizes in the comparison of children with learning disabilities with average to high-achieving students. There were large effect sizes on teacher ratings of social skills and peer ratings for social preferences. Children with learning disabilities received lower scores on these measures than their average to high-achieving classmates. For positive peer nominations, global self-worth and scholastic self-perception, medium sized effects were found. For negative peer nominations and social self-perception there was a small effect size, which indicates that children with learning disabilities were more likely to be negatively nominated than average to high-achieving students, and that children with learning disabilities have less favourable social self-perceptions.

Different results were obtained when children with learning disabilities were compared with low-achieving students. Due to a lack of data, peer ratings could not be compared. There was no statistically significant effect of scholastic self-perception and social self-perception. Differences were found regarding teacher ratings, social preference and global self-worth. The results indicate lower scores for children with learning disabilities.

However, in both comparisons, there was no homogeneity of variance. This reveals large differences in effect sizes between studies: some studies found positive effect sizes, while others found negative effect sizes. Thus, outcomes and outcome effect sizes differed across studies. Further, Nowicky (2003) classified non-described control groups as average to high-achieving control groups, while there may have been low-achieving students in these groups as well. If this is the case, there might even be a larger difference between low and average to high-achieving children.

Frostad and Pijl (2007) investigated the social position of children with special needs in regular education. They performed a sociometric scale and administered a questionnaire about social skills on nearly 1000 children in 4th and 7th grades in Norway. Of these children, teachers considered 8% to have special educational needs such as serious behaviour problems, mild, moderate or severe learning problems and communication problems. Children with special needs proved to be less well accepted than their classmates: they were less popular, they had fewer reciprocal friends and they were less often part of a subgroup of peers.

Of the children with special needs in grade 4, nearly 15% were not accepted by their classmates, compared to 2.4% of the children without special needs. This difference was even larger in 7th grade: at this age, nearly 25% of the children with special needs were not accepted by their classmates, compared to 4% of their classmates without special needs. Regarding the questionnaire on social skills, children without special needs seemed to score higher than children with special needs in 7th grade, but not in 4th grade. There seemed to be some relationship between social skills and social position in the class. This relationship was insignificant for all children with special needs, but was significant on empathy for children with behavioural problems. Empathic children with behavioural problems were better accepted by their classmates than less empathic children with behavioural problems. This study suggests that the social position of children with special needs is less favourable than the social position of other children in the class and that their position deteriorates as they get older.

Estell et al. (2008) performed longitudinal research on the effect of inclusion on the social position of children with mild learning disabilities in the US. Mild learning disabilities included, for example, difficulties with oral expression, listening comprehension, basic reading skills and mathematical reasoning. To investigate the social position of children with mild learning disabilities, Estell et al. (2008) assessed different social and sociometric measures on 1361 elementary school students. Fifty-five children were identified as children with mild learning disabilities. The results showed no differences in group membership and intragroup centrality between children with and without learning disabilities. Children with learning disabilities were equally often members of a group within their classes and were equally central in these groups. Similarly, their groups did not differ in size and centrality in the class.

Children with learning disabilities were, however, less often nominated as being someone's best friend and were less often nominated as popular. Children with learning disabilities also scored lower on social preference. This means that they were less often nominated as most liked or that they were more often nominated as least liked. These findings proved to be stable over time. There was no difference between the position of children with learning disabilities in third grade and their position in 6th grade.

4.5. Conclusions

From most of the described studies, it is not possible to draw conclusions about the effect of inclusive education on the social development of children with special educational needs. Many studies did not use a control group in special education. These studies seem to show a difference between children with and without special educational needs. Children with special educational needs are less well liked than their peers without special educational needs: often, they are assessed more negatively on sociometric questionnaires (Estell et al., 2008; Frostad & Pijl, 2007; Nowicky, 2003).

In the studies with control groups, mixed results are found. Wiener and Tardif (2004) found positive results on measures of social and emotional functioning and self-perceptions. Bakker and Bosman (2003), on the other hand, found that children in inclusive education are more negatively assessed by their peers and that they have a less positive self-image than children with special educational needs in special education. Other researchers found no clear differences (Jepma, 2003; Peetsma et al., 2001).

It might be that the number of interactions with children without special educational needs increases because of inclusive education, but that students with special educational needs still have a less positive social position than their peers without special educational needs. Besides that, none of the described studies has directly investigated the effect of inclusive education on contacts in the neighbourhood, while inclusion might have a positive effect on these contacts (Nakken & Pijl, 2002).

5. Academic effects on the other children in the class

The effect on the other children in the class is another important topic in inclusive education. A frequently heard argument against inclusive education is that it could have an adverse effect on the achievement of the children without special educational needs. Children with special educational needs could take up more of the teacher's attention, which might adversely affect the other children (Dyson, Farrell, Polat, Hutcheson, & Gallannaugh, 2004; Staub & Peck, 1994). Furthermore, the general standard of education in the class might be lowered (Huber, Rosenfeld, & Fiorello, 2001) and the other children in the class might get distracted by the children with special educational needs. On the other hand, proponents of inclusive education state that in inclusive classes, there is more adaptive education, which might have a beneficial effect on all the children (Dyson et al., 2004). Besides that, the extra teachers or teacher assistants that are often appointed in inclusive schools, might have a positive effect on the children without special educational needs as well. Some research has been done on this topic.

5.1. Positive findings

Cole et al. (2004) investigated the effect of inclusive education on children without disabilities. They compared inclusive and non-inclusive primary school classes in Indiana (US). Inclusive classes were defined by the presence of students with learning disabilities and mild mental disabilities at reading and mathematics lessons. In non-inclusive classes, disabled students had these lessons in separate classes. Achievement was measured with a reading and a mathematics test. Data on 606 students without disabilities in inclusive and non-inclusive classes were analysed. Students in inclusive classes proved to achieve better than children in non-inclusive classes, even when the results were corrected for pre-test scores and expenditure per student. The authors explain these results by stating that the non-disabled students profit from the additional support available in inclusive classrooms.

Kalambouka et al. (2007) reviewed the literature on the effects of inclusive education on outcomes for regular students. They systematically searched and assessed relevant articles in electronic databases. To be included, studies needed to be empirical, report evidence of the impact of an intervention and concern children in the age of compulsory schooling (5–16). No limitations were set for the period in which the studies were published. Kalambouka et al. (2007) found 26 studies matching their criteria. Studies were classified into finding positive, negative and neutral outcomes for the inclusion of different categories of children with special educational needs.

Concerning inclusion of pupils with cognitive and learning difficulties, most outcomes for primary school children were neutral: 12 studies reported neutral outcomes, 4 reported positive outcomes and none reported negative academic outcomes. There were fewer studies about inclusion of students with cognitive and learning difficulties in secondary education. One study found neutral results, and one study was classified as finding negative results. This was a study by Cawley, Hayden, Cade, and Baker-Kroczyński (2002). The authors of this study interpreted their results as positive but the data in the tables seem to indicate that a negative conclusion would be more appropriate.

For behavioural, emotional and social difficulties, similar results were found. For primary education, six studies found neutral results and three studies found positive results. For secondary schools, one study found neutral results and one (by Cawley et al., 2002) was classified as finding negative results. Concerning students with sensory or physical and communication disabilities, results were rather positive: in primary education, 12 studies found neutral results and 6 found positive results. In secondary education, only one study was found. This showed neutral results. Only one study described by Kalambouka et al. (2007) overlapped with the studies included in this review. This concerns the paper by Huber et al. (2001), described in Section 5.3.

Rouse and Florian (2006) used data from the English National Pupil Database. They investigated the achievement of 2448 children in secondary schools in one district. To investigate the academic progress (e.g. progress in literacy, numeracy, science) of these children, they compared grades at Key Stage 2 – just before secondary education – with national tests at the end of secondary school. To investigate the effect of inclusive education, the progress of students at three schools with more than 25% students with special educational needs was compared to similar schools with less than 12% students with special educational needs. Special educational needs included problems with communication and interaction, cognition and learning, behaviour, emotional and social development, and sensory and/or physical problems.

Compared to the non-inclusive schools, mean progress proved to be higher in inclusive schools. However, this difference was not found when inclusive schools were compared to all schools in the district. When the inclusive schools were analysed separately, results were even more complex. One inclusive school had a higher mean progress, one had a lower mean progress and the third did not differ from the comparison schools. In the qualitative analysis, schools proved to be very different as well. This study seems to show a small positive effect of inclusive education. However, there turned out to be large differences between schools. This seems to indicate that other differences between schools are more important than the inclusiveness of the school.

Demeris, Childs, and Jordan (2007) performed a large-scale study on the effect of inclusion on the achievement of students without special needs. They used student grades on a standardised provincial test in Ontario, Canada. This test measures achievement in reading, writing and mathematics in grade 3. Students with special needs were identified as those who had been formally identified as exceptional and those who received additional accommodation during the assessment.

To investigate the effect of inclusion on the achievement of children without special needs, class averages of children without special needs were computed. Two thousand one hundred and fifty-two classes with more than 16 students were included. When corrected for class size and SES, the correlation between the number of students with special needs and the achievement scores of children without special needs was small but significant, ranging from 0.052 to 0.074. This means that students without special needs performed slightly better when the number of students with special needs in their classes increased. However, the amount of explained variance was very small: 0.3% for reading and writing and 0.5% for mathematics. Furthermore, it is unclear what arrangements were made for children with special needs.

5.2. Negative findings

Dyson et al. (2004) performed a large study into the effects of inclusion on the achievement of students without special educational needs. They analysed the scores in the English National Pupil Database. To investigate the effect of inclusion on the achievement of the other students, the authors performed multi-level regression analyses, in which they controlled for the effect of background variables like the number of free school meals, age, sex and mother tongue. They defined inclusion as the number of students with a special educational needs statement and students who were placed in School Action Plus. To avoid distortion by the presumed lower scores of students with special educational needs, the authors controlled for the effects of having special educational needs.

At a regional level there proved to be no relationship between the inclusiveness of the Local Educational Authority (LEA) and student achievement. At school level, a small significant relationship between school inclusivity and student achievement was found. In schools with a higher level of inclusion, student achievements were on average lower, even when the background variables were taken into account. According to the authors, however, there are a few problems with this conclusion. They state that the effect found is small, both in terms of the decline in achievement and in the percentage of special needs students needed to have an effect on the achievement of the other students. Furthermore, the results were highly variable between schools. This indicates that other differences between schools are more important than the inclusivity of the school.

In addition to the multi-level regression analyses, the authors did a qualitative case study on the effect of inclusion, in which they compared a sample of highly inclusive primary and secondary schools. Some of these schools were academically high-performing schools, others performed less well. To compare these schools, Dyson et al. (2004) used various methods of collecting data, including interviews with head teachers, teachers and parents, document analysis, observations and surveys. There proved to be large differences between high-achieving schools. There was no clear pattern of general best practice: some schools chose to place children out of regular classes during some lessons, others chose to use teacher assistants. In general, there seemed to be a couple of recurrent elements: flexibility, customisation of care for and monitoring of individual students, flexibility of pedagogy in mainstream classes, school commitment to inclusion and strategies for raising the achievement of all students.

To summarise, Dyson et al. (2004) did not find any effect of inclusion at LEA level. At school level, there was a small effect: on average, children in inclusive schools achieved somewhat lower than children in non-inclusive schools. Nevertheless, other background characteristics proved to be more important than school inclusivity. However, there are some problems with this research. First, the results were analysed at LEA and school level, not at class level. Second, the authors did not make a distinction between different kinds of special educational needs, while there could be a difference between the effects of including children with behavioural problems and children with learning problems.

5.3. Mixed or undecided findings

Huber et al. (2001) investigated the differences in achievement between inclusive and non-inclusive classes with the same curriculum in Eastern Pennsylvania (US). According to the authors, the curriculum was designed to support inclusive education. Four hundred and ten children were investigated. Of the 49 disabled children, most had learning difficulties but there were children with behavioural difficulties in the sample as well.

The inclusive curriculum seemed to benefit the low-achieving students: during the 2 years of measurements they showed more progress on both mathematics and reading than the high-achieving students. There were no differences for reading scores between students in inclusive and non-inclusive classes. For mathematics, there were differences between inclusive and non-inclusive classes. However, the pattern was unclear: some inclusive classes showed less improvement in performance than non-inclusive classes, while other classes showed more improvement than non-inclusive classes. This permits the conclusion, therefore, that inclusion does not have a large impact on the achievement of children without special educational needs. However, inclusive curricula seem to benefit the low-achieving students: they seem to show more progress than high-achieving students. Nevertheless, this difference might also be caused by a ceiling effect for high-achieving students.

5.4. Conclusions

It is difficult to draw clear conclusions from the literature about the effects of inclusive education. Some studies find positive effects (Cole et al., 2004; Demeris et al., 2007), others find negative effects (Dyson et al., 2004) and others find no effects (Huber et al., 2001). The review by Kalambouka et al. (2007) came to a similar conclusion: 23% of the studies showed positive results, 58% showed neutral results and 9% showed negative results.

However, some important qualifications need to be made with regard to these findings. First, there are large differences in design between the described studies. In some studies, extensive additional support was available, while in others, this did not seem to be the case. The way students were included differed as well: in some studies, children were included all day, but in others, children were only included for some lessons during the day.

Furthermore, differences between schools seem to be more important than inclusive or non-inclusive education. Dyson et al. (2004), Rouse and Florian (2006), and Demeris et al. (2007) found contradictory effects of inclusive education, but all these effects proved to be less important than other differences between the schools.

Finally, there might be a differential effect of inclusive education. Huber et al. (2001) found that inclusive curricula seemed to benefit the low-achieving students. Unfortunately, other studies have not investigated the presence of a differential effect for high-achieving and low-achieving students. To our knowledge, there is only one study available on the inclusion of students with more severe special educational needs: Dumke (1991, cited in Pijl et al., 2003) found more high-achieving and more poor-achieving students without special educational needs. These findings suggest that there is a differential effect for high-achieving and low-achieving students without special educational needs. This is an important point to note, because neutral results can be caused by this differential effect: when one group achieves better and another group achieves worse, the average will be neutral.

6. Social effects on the other children in the class

Many advocates of inclusive education argue that inclusive education has a positive social effect on children without special educational needs (Maras & Brown, 2000). These children are said to become more aware and less afraid of differences between people (Staub & Peck, 1994). Children without special educational needs are said to develop fewer prejudices against and more friendships with children with special educational needs (Staub & Peck, 1994). Opponents, however, argue that children without special educational needs could copy undesirable behaviour from children with special educational needs (Staub & Peck, 1994).

Very little research has been done into the social effects of inclusive education on children without special educational needs. Only one study fitted the criteria described in our method section. To give a more extensive picture of the social effects on the other children in the class, a separate section on the inclusion of children with more severe special educational needs was added (Section 6.2).

6.1. Positive findings

The study by Kalambouka et al. (2007) cited earlier also investigated the social effects of inclusion on the children without special educational needs. Concerning inclusion of pupils with cognition and learning difficulties, most outcomes for primary school children were positive: four studies reported positive outcomes, three reported neutral effects and two reported negative effects. Unfortunately, these studies are not explicitly described in the text. For behavioural, emotional and social difficulties, two studies found a positive effect, two found a neutral effect and one found a negative effect. Brown (1982, cited in Kalambouka et al., 2007) found that inclusion of children with behavioural problems influenced the classroom climate and the learning environment in a negative way. Fewer studies are available on the effects of inclusion of children with sensory or physical and communication disabilities. In primary education, three studies found positive results and one found neutral results. In secondary education, the authors found no studies on this subject. All in all, from the review of Kalambouka

et al. (2007) there seems to be a slightly positive effect of inclusion on the social outcomes of the other children in the class.

6.2. Research on children with more severe special educational needs

Salend and Garrick Duhaney (1999) reviewed eight studies on the social effects of inclusion on the other children in the class. This review seems to show positive effects on children without special educational needs: children in inclusive settings showed an increased acceptance, understanding and tolerance of individual differences. Children in non-inclusive schools were more likely to engage in stereotyping and to hold more negative perceptions of diversity and of students with disabilities. In two studies, children without special educational needs described some negative experiences as well as the recurrent positive experiences. Some children stated that communication difficulties were a barrier that interfered with their relationships with disabled peers. Other children experienced initial discomfort with the physical appearance and behavioural characteristics of some students with disabilities. However, this discomfort seemed to fade over the course of the year.

Nakken and Pijl (2002) also reviewed the social effects of inclusion on non-disabled students. They describe five studies on this topic, all of which report positive effects of inclusive education on students without disabilities. Children in inclusive schools had more positive attitudes towards children with special educational needs and had more contact with them. However, it is unclear whether this attitude only applied to their classmates, or whether it was generalised to other people with disabilities as well.

In an English study, Maras and Brown (2000) investigated the generalisation effect of contacts with children with physical disabilities, hearing impairments and learning disabilities. They studied the attitude to disabled students of 256 non-disabled primary school students. Besides the generalisation effect, Maras and Brown (2000) investigated differences between schools. Some of the schools were non-inclusive, some of the inclusive schools were informative about the disabilities of disabled students, and other inclusive schools tried to emphasise the disability as little as possible. In all kinds of schools, students with disabilities were assessed less positively on sociometric measures and questionnaires about capabilities than children without disabilities. However, at schools which were informative about the disability, non-disabled children were more willing to play with disabled children they did not know. There appeared to be no differences between non-inclusive schools and inclusive schools which were uninformative about disabilities. These results indicate that a school climate of openness about disabilities is an important factor for generalisation by non-disabled students.

6.3. Conclusions

As stated earlier, there is very little research available about the social effects of including children with mild special educational needs on children without special educational needs. Studies investigating this topic mostly find positive or neutral and mixed effects. Very few studies find negative effects. In studies of children with more severe special educational needs, there seems to be a positive social effect of inclusive education on children without special educational needs: children in inclusive classes have fewer prejudices about children with special educational needs, they are more willing to play with these children and they have a more positive attitude towards them (Nakken & Pijl, 2002; Salend & Garrick Duhaney, 1999).

In most studies, however, it is unclear whether the children's general image of people with special educational needs improves, or whether the more positive image only extends to their classmates with special educational needs. Moreover, children with special educational needs are less well accepted than their classmates without special educational needs (Estell et al., 2008; Nowicky, 2003). These results indicate, therefore, that children without special educational needs in inclusive classes are more positive about children with special educational needs, but that they are still less positive about them than about their peers without special educational needs.

7. Discussion

This review has described literature on the effects of inclusion of children with mild to moderate special educational needs. In this section, we summarise the results of our review and describe the implications for further research and for education policy.

The effect of inclusive education on the academic achievement of children with special educational needs seems to be slightly positive. Very few studies found negative effects of inclusion on the achievement of children with mild to moderate special educational needs. Quite a few studies found neutral or positive effects (e.g. Lindsay, 2007; Markussen, 2004; Peetsma et al., 2001). The studies into the socio-emotional effects of inclusive education indicate that children with special educational needs are in a less favourable social position than children without special educational needs (e.g. Estell et al., 2008; Nowicky, 2003). It is hard to draw conclusions about the effect of inclusive education: there are very few studies that compare children with mild to moderate special educational needs in inclusive and special education. Furthermore, the results from the studies that are available are not clear: some found positive effects, but others found negative socio-emotional effects of inclusive education (Bakker & Bosman, 2003; Wiener & Tardif, 2004). More research is needed comparing children with special educational needs in inclusive and special education.

Studies into the effects of inclusion on the academic achievement of children without special educational needs mostly found positive or neutral results (e.g. Cole et al., 2004; Kalambouka et al., 2007). However, there are signs of a differential effect of inclusion on children without special educational needs. Inclusion might affect high-achieving and low-achieving students differently. Unfortunately, very few studies make a distinction between high-achieving and low-achieving students without special educational needs. This is a serious problem, because neutral results may be caused by positive effects for some students and negative effects for others cancelling each other out. For example, if the results are positive for high-achieving students, and negative for low-achieving students, the average results will be neutral. For that reason, it is very important that this distinction be made in future research.

Little research is available on the social effects of inclusion of children with mild to moderate special educational needs on children without special educational needs. Such research as there is mostly finds positive or neutral and mixed effects. Studies on children with more severe special educational needs indicate that children without special educational needs in inclusive classes have fewer prejudices about children with special educational needs, that they are more willing to play with these children and that they have a more positive attitude towards them (e.g. Nakken & Pijl, 2002). However, little is known about the extent to which these views can be generalised: it is not known whether these positive effects extend to other people with mild to moderate and severe special educational needs. More research is needed on this topic.

However, there are some limitations on this review. First, as stated in the introduction, there are many ways to provide inclusive education. There are differences between the groups of students included in regular classes, differences in curricula and differences in the degree and design of additional support for students with special educational needs and their teachers. This makes it difficult to compare studies and to generalise findings into practice. Moreover, there are some indications that the effects of inclusive education can vary between different methods of inclusion (Markussen, 2004; Wiener & Tardif, 2004). However, conclusions on this topic cannot be drawn, as there has been insufficient research into differences between inclusion designs and the descriptions of the designs in other studies are too superficial to infer conclusions on this topic. More research is therefore needed here.

Second, in this review, we examined the effects of inclusive education on students. There may be other effects as well, for example on teachers. Teachers might feel unable to teach children with special educational needs, or might feel that their job places higher demands on them in inclusive classes. Furthermore, teachers' attitudes to inclusion might be important. Scott, Vitale, and Marsten (1998) state that there is a positive correlation between the attitudes of teachers to inclusive education and the use of effective mainstreaming strategies. These effects also need to be considered. Third, this review confined itself to qualitative descriptions of the studies; there is no meta-analysis of the statistical effects. It is not known, therefore, whether the overall effects are statistically significant. Finally, the focus in this review is mainly on quantitative studies, many qualitative studies, which may contain interesting findings, are not taken into account. Qualitative studies often focus more on the processes and experiences in inclusive education. To gain a complete picture of the effects of and the processes behind inclusive education, qualitative studies should be taken into account as well.

Nevertheless, the international trend towards inclusive education seems to be justified. In general, there seem to be neutral or positive results of inclusion of children with mild to moderate special educational needs. There are clearly fewer indications of negative effects of inclusive education. If arguments are based on the empirical evidence instead of the human rights debate, therefore, there still seems to be a good case in favour of inclusive education. Remarkably however, most of this research has been done since the adoption of the Salamanca Statement and the implementation of inclusive education in many countries. At the time of the Salamanca Statement, there was little evidence on the effects of inclusive education one way or the other. It may have been advisable to do more research before implementing inclusive education on such a large scale.

At this moment, there seems to be sufficient support for inclusive education for children with mild to moderate special educational needs. However, it is still very important to investigate the effects of specific inclusion policies: there may be differential effects for different groups of children and differential effects of different inclusion practices. When designing inclusive education policies, it is important to keep this in mind: the policy effects should be closely monitored to avoid negative results for specific groups of students.

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