



ISSN: 0885-6257 (Print) 1469-591X (Online) Journal homepage: [www.tandfonline.com/journals/rejs20](http://www.tandfonline.com/journals/rejs20)

## Inclusion of pupils with autism – a research overview

Ingrid Olsson & Claes Nilholm

To cite this article: Ingrid Olsson & Claes Nilholm (2023) Inclusion of pupils with autism – a research overview, European Journal of Special Needs Education, 38:1, 126-140, DOI: [10.1080/08856257.2022.2037823](https://doi.org/10.1080/08856257.2022.2037823)

To link to this article: <https://doi.org/10.1080/08856257.2022.2037823>



© 2022 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



[View supplementary material](#)



Published online: 13 Feb 2022.



[Submit your article to this journal](#)



Article views: 17500



[View related articles](#)



[View Crossmark data](#)



Citing articles: 12 [View citing articles](#)

## Inclusion of pupils with autism – a research overview

Ingrid Olsson  and Claes Nilholm 

Department of Education, Uppsala University, Uppsala Sweden

### ABSTRACT

This overview, or review of reviews, synthesises the contributions of influential research on education of autistic pupils to a) characterise this research and b) analyse the potential of this research to further inclusive education. The 80 most-cited reviews in Web of Science targeting research on education of autistic pupils were analysed. From the standpoint of inclusive education, several shortcomings in the research field were identified: First, the reviews very seldom explicitly address inclusion. Second, when they do, inclusion is narrowly understood. Third, only about half of the reviews concerned regular education. Finally, most reviews report positive effects but provide limited knowledge about what methods are most useful for specific sets of pupils and in which situations. The majority explores how to reduce symptoms of autism and how to foster socio-communicative skills. The Inclusive Education Model (IEM) was developed to analyse how different types of research, including research not specifically addressing inclusion, provide different forms of knowledge about how to increase inclusive schooling. The findings are discussed in relation to needs for future research on inclusion and it is argued that the field would benefit from more explicit orientations towards inclusive education. The benefits and shortcomings of IEM are discussed

### KEYWORDS

Inclusive education; autism spectrum disorder; special needs; overview; review; teaching

## Introduction

The last decades have seen a large increase in research on autism and in reviews that synthesise such research (e.g. Volkmar 2020). We are working on a third level of analysis, labelled the *overview* level, the first and second levels being original research and reviews. We are interested in the topography of the research landscape. It is important to understand the knowledge contributions of reviews as they shape which results get spread in society and future research (Suri and Clarke 2009). Previous overviews addressed questions concerning intervention efficacy (Krebs Seida et al. 2009; Mostert 2004; Reichow 2012). Our point of departure is broader, covering different kinds of research on autistic pupils. The current study follows the Systematic Mapping and Analysis of Research Topographies (SMART) methodology, which was developed by Nilholm (2017; cf. Román, Sundberg, Hirsch, Forsberg, and Nilholm, ;2021) as a way to do systematic and reflective overviews. The main purpose of this overview is thus to analyse influential reviews concerning education for autistic pupils to understand how those reviews might

**CONTACT** Ingrid Olsson  [Ingrid.Olsson@edu.uu.se](mailto:Ingrid.Olsson@edu.uu.se)

 Supplemental data for this article can be accessed [here](#).

© 2022 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

contribute to inclusive education. An additional aim is to evaluate strengths and weaknesses in this research area regarding its potential to help develop more inclusive environments for autistic pupils.

In this introduction we will present the theoretical points of departure of the current overview and how we view inclusive education. This article is based on a pragmatic research tradition (Dewey 1966; James 1907) that attaches importance to the utility of research, not least to making education more democratic and equitable—an aim in line with a reconstructive approach to education (Schiro 2013). Specifically, we want to use prior research to gain knowledge about how schools can become more inclusive. Recalling Lewin's (1951) notion that there is nothing as practical as a good theory, we believe that current thought about how to increase inclusion could certainly benefit from some theoretical development. In addition, pragmatism involves openness to theoretical perspectives. We believe that a full understanding of inclusion requires research from within different theoretical perspectives (cf. Burrell and Morgan 1979). In this article we will distinguish between functionalist, hermeneutical, and critical perspectives (cf. Habermas 1987). These differ qualitatively regarding their stances on science, and with regard to their views of society (cf. Burrell and Morgan 1979). The functionalist perspective is objectivist and views society as characterised by social order, holding that laws and regularities in the social order are sought, often with the goal of improving the workings of society. This line of research searches for answers to questions of 'what works'. The hermeneutical perspective concerns meaning making and focuses on experiences and interpretations. This research has a subjectivist stance towards science and shares with functionalism the view that society is characterised by consensus. The critical perspective (Habermas 1987), on the other hand, questions the social order and is based on the idea that research should be emancipatory and lead to change. Thus, examples of functionalist, interpretative, and critical studies would be, respectively, a study of the effectiveness of an intervention, a study of the experiences of autistic persons, and a study of how autistic pupils are subordinated to notions of able-bodiedness.

The pragmatic approach fits well with international efforts towards more inclusive education, as reflected in international documents from the Salamanca Statement onward (e.g. UNESCO 1994). If inclusion is a goal one must be clear what is meant by inclusion. Florian (2014) describes that inclusion is when differences are seen as essential parts of life and teachers respond to differences without marginalising pupils. Nilholm and Göransson (2017) distinguished between four definitions of inclusion, calling them placement, specified individualised-, general individualised-, and community definitions. In the order listed, the definitions involve successively stricter criteria for what counts as inclusion. Under the placement definition, mere presence in the classroom suffices for inclusion. It is the most common definition of inclusion within research (Nilholm and Göransson 2017), despite arguments that inclusion requires more than placement and that 'regular classroom' is not easily defined (e.g. Odom 2019). The specified individualised definition includes placement plus the criterion of meeting the needs of pupils with disabilities. The general individualised definition expands that requirement to one of meeting the needs of all pupils. Finally, the community definition involves the additional criterion of creating communities in schools and classrooms where all pupils belong and are positively valued. The community definition is in line with Florian's (2014) definition of inclusion. In the current overview, we will use a model based on this way of understanding

inclusion – *the Inclusive Education Model (IEM)* – as a theoretical tool for understanding research contributions. In accordance with the goal of reconstructing education to make it more democratic and equitable, the current overview is especially interested in whether and how research on autistic pupils contributes to the knowledge about how to create inclusive communities. According to IEM, as illustrated in (Table 1), the different ways of promoting inclusion under its definitions as placement, specified individualised, and general individualised are necessary steps towards creating the goal of inclusive communities.

### **Aim and research questions**

The aim of this article is to examine the most-cited reviews in Web of Science (WoS) concerning education for autistic pupils to shed light on the strengths and weaknesses in this research in terms of its potential to help develop more inclusive education. The following research questions will be addressed:

- (1) Do the reviews contribute to knowledge within the functionalist, the critical, and/or the hermeneutical theoretical perspectives?
- (2) Do the reviews explicitly address inclusive education?
- (3) What explicit definitions of inclusive education are provided in the reviews?
- (4) What do the reviews contribute to the knowledge about inclusive education?
- (5) What common shortcomings in the first-level research can be identified in the reviews in relation to knowledge contributions to inclusive education?

### **Materials and methods**

#### ***The Systematic Mapping and Analysis of Research Topographies methodology (SMART)***

SMART is built on the idea that it is important to critically analyse influential research to facilitate the development of research and educational practices (e.g. Nilholm 2017; Román et al. 2021). The methodology has previously proven useful for understanding education and special needs education (e.g. Nilholm and Göransson 2017; Román et al. 2021). SMART is similar to scoping reviews (e.g. Peters et al. 2021; Sucharew and Macaluso 2019) in the intend to understand a research field. However, SMART is distinguished by an

**Table 1.** The inclusive education model (IEM).

	Degree of inclusive education				
	Placement	Specified	General	Community	
Methods to promote inclusion	Increasing the proportion of pupils with regular educational placement	Developing education to meet the needs of autistic pupils	Developing education to meet the needs of all pupils	Creating inclusive communities	

Note. Placement = placing autistic pupils in regular educational settings; Specified = meeting the needs of autistic pupils, General = meeting the needs of all pupils; Community = inclusive communities.

acknowledgement of several scientific paradigms, an emphasis on making the theoretical points of departure of the overview explicit, and a focus on much-cited research. While quite a few scoping reviews have an openness towards different theoretical orientations, it is much rarer to make the theoretical points of departure explicit and the focus in scoping reviews is not on high-impact. Generally, scoping reviews are about mapping a research field while SMART is about critically analysing high-impact research in a field from explicit theoretical points of departure.

### **Search strategy**

We used WoS, as it is highly recognised and has the explicit aim to include only research with a high level of quality and importance (Birkle et al. 2020). WoS Core Collection was searched August 2020 using the following search-string in the topics field: review\* OR overview\* OR meta-analys\* OR synthe\* AND autis\* OR asperger\* OR ASD\* OR pervasive-developmental-disorder\* OR disintegrative-disorder\*. The search was limited to these content areas: psychology-developmental, education-special, behavioural-sciences, psychology-clinical, psychology, psychology-multidisciplinary, language, linguistics, multidisciplinary-sciences, psychology-experimental, social-sciences-interdisciplinary, education-educational-research, linguistics, psychology-educational, family studies, psychology-applied, and psychology-social. In total, 4261 reviews fulfilled the search criteria.

### **Criteria for inclusion**

The identified reviews were sorted by WoS based on number of citations. Thereafter, abstracts, aims, and main findings were scanned to examine if they met the inclusion criteria (starting with the most-cited review, followed by the second most-cited review, and so on). Reviews were included if they explicitly mentioned education (or *teachers* or *school*, for example) for autistic individuals (or *autism* or *autism spectrum diagnosis* or *Asperger*, for example) up to and including high-school age. We did not exclude reviews if they, for example, did not mention inclusive education. We included the reviews with the highest citation records that fulfilled the inclusion criteria until we had the predetermined numbers of reviews. In total, 80 reviews were selected for further analysis, distributed across the following time periods: the year 2000 and earlier (10 reviews, WoS covers journals from the year 1900); 2001–2005 (10 reviews); 2006–2010 (20 reviews); 2010–2015 (20 reviews); and 2015–2020 (20 reviews). From each time period, the most-cited reviews were included.

### **Coding, categorisation and data analysis**

A coding scheme, adapted from Román et al. (2021), was used. Data were extracted by the first author, and any coding problems that emerged were discussed with the second author. The following information about each review was recorded:

- (a) Publication facts (authors etc.)
- (b) Genre (e.g. meta-analysis)

- (c) Context of the first-level research (e.g. school form)
- d) Aspects of education examined (e.g. methods)
- (e) Does the review explicitly describe a theoretical perspective by which it is guided? (yes/no)
- (f) What is the explicit or implicit theoretical perspective guiding the review? (functionalist/critical/hermeneutical/other)
- (g) Is inclusion explicitly defined? (yes/no)
- (h) What is the explicit definition of inclusion? (placement/specify individualised/general individualised/community/other)
- (i) What are the main knowledge contributions?
- (j) Shortcomings in the first-level research identified in the review

Some of the codes above needs clarification: Many reviews covered different contexts, and if they at least partly studied regular education, we noted that. Reviews that never mentioned regular education were categorised as not examining regular education, as they did not explicitly study regular education (even though they still might include research from regular educational settings). Methods are defined as 'ways to work', and thus we include both narrow practices and broader programmes (cf. Odom et al. 2021). Concerning theoretical perspectives, the functionalist perspective code was used for reviews that were objectivistic and searched for answers to issues of 'what works?'. The hermeneutical perspective code was used for reviews that concerned meaning making and focused on experiences and interpretations. The critical perspective code involved reviews that questioned the social order and aimed to be emancipative and lead to change. Concerning inclusion, we looked for different ways it might be labelled in the reviews – *integration*, for example – and we treated data containing such expressions as data related to inclusion. We used IEM (Table 1) to categorise the main knowledge contributions, primarily by describing the main findings highlighted in the abstracts. Concerning shortcomings identified in the reviews, we only report shortcomings with likely consequences for the knowledge contributions to inclusive education.

Codes (a) through (d) are used as background data, and the research questions were addressed by the other codes as follows:

- (1) Do the reviews contribute to knowledge within the functionalist, the critical, and/or the hermeneutical theoretical perspectives? (e) and (f)
- (2) Do the reviews explicitly address inclusive education? (g)
- (3) What explicit definitions of inclusive education are provided in the reviews? (h)
- (4) What do the reviews contribute to the knowledge about inclusive education? (i)
- (5) What common shortcomings in the first-level research can be identified in the reviews in relation to knowledge contributions to inclusive education? (j)

In the last step, the categorisations of theoretical perspectives and contributions to inclusion were analysed, using the three theoretical perspectives and IEM, and themes within the common shortcomings were searched for. Below, we present the outcome together with examples of articles from different time periods that illustrate the findings.

To save space, the complete reference list with the reviews included in the findings and a more detailed presentation of each review are available as supplemental online material.

Bottema-Beutel et al. (2021) show that many English-speaking autistic adults often prefer the concept 'autistic'. In this article, we therefore use 'autistic pupils'.

## Results

First, we present the findings concerning theoretical perspectives. Then, we present the knowledge contributions of the reviews targeting inclusion followed by the knowledge contributions of the reviews that do not aim to study inclusion.

### Theoretical perspectives

No authors explicitly mention a theoretical perspective at the level that we are looking for. However, according to the coding, a striking majority (78/80 or 98%) of the reviews are written within a functionalist perspective. These reviews produce knowledge about 'what works' to help autistic individuals learn and develop (e.g. Kazdin and Weisz 1998; Mandy and Lai 2016; Rogers and Vismara 2008; Volkmar et al. 2004; Wong et al. 2015). Some authors that use a functionalist perspective also question the assumptions of this perspective. For example, Parsons (2016) asks for research on the pupils' preferences implying a need for hermeneutical approaches. McConnel (2002) critically asks when interventions that aim to change a person are appropriate as cultural standards for acceptable behaviours may change. Harrower and Dunlop (2001) address effective methods to promote inclusion and also criticise the school system for not being inclusive. Two reviews contribute within the hermeneutic perspective and they both address individual's own perspectives (DePape and Lindsay 2016; Roberts and Simpson 2016). The reviews within the hermeneutic perspective are published during the last time period. No review contributes within a critical perspective.

### Reviews targeting inclusive education

Only a minority (3/80 or 4%) of the reviews explicitly target inclusion. They are published within different time periods. The oldest review that explicitly set out to study inclusive education is written by Harrower and Dunlop (2001). They use the placement and the specified individualised definition (see IEM) and make knowledge contributions within the functionalist perspective. Focus is on data-based methods to include autistic pupils but they also reflectively discuss inclusion as a civil right. Harrower and Dunlop conclude that several strategies based in behaviour analysis are useful for at least some autistic pupils in some classrooms, including antecedent manipulations, self-management and peer-mediated interventions. This review contributes with knowledge about how to increase regular educational placement and how to meet the educational needs of autistic pupils. In the next review that explicitly targets inclusive education, by Watkins et al. (2015), inclusion is defined as placement in regular education. Their review is also conducted within the functionalist perspective. Watkins et al. examine research on peer-mediated social-interaction interventions and show promising effects on social

interaction skills of the autistic pupils. Thus, they contribute to how to meet the needs of autistic pupils (see IEM). The newest review that explicitly addresses inclusive education is written by Roberts and Simpson (2016). They use a community definition and state that inclusion is defined by full participation of the members in a school community. Roberts and Simpson contribute within the hermeneutic perspective. Their results add knowledge about the experiences of autistic pupils, as well as other persons' perspectives, of regular education. The findings describe views on being understood, knowledge of autism, attitudes, networks, and opportunities do develop social-communicative abilities. Stakeholders ask for acceptance and for a willingness to adapt the educational environment instead of changing the pupils. It is argued that both pupils with and without autism benefit from inclusion as it gives opportunities for experiences and acceptance of diversity. Thus, this review contributes to how to create inclusive communities (see IEM).

### ***Reviews not explicitly targeting inclusive education***

In this section, as regards the reviews that do not explicitly target inclusive education, we present general information about the reviews, the knowledge contributions of the reviews that address a wide range of difficulties within the same review, the knowledge contributions of the reviews that are each delimited to address a specific outcome and, finally, summarising conclusions about the reviews that do not explicitly target inclusive education.

#### ***General information about the reviews***

Most reviews (77/80 or 96%) do not explicitly target inclusive education. As illustrated in (Table 2), about half (42/77 or 54%) of these reviews describe that they fully or partly examine regular educational settings. The remaining reviews (35/77 or 45%) examine non-regular educational contexts or do not provide information about the contexts. (Table 2) also presents the key knowledge contributions of the reviews that do not explicitly target inclusive education. A more detailed presentation of each review is available as supplemental online material.

#### ***Knowledge contributions of reviews targeting a wide range of outcomes***

Most reviews (47/77, or 61%) address a wide range of challenges that autistic pupils might face (e.g. symptoms of autism) and how to develop desired behaviours and skills. About half of these reviews (27/47, or 57%) examine within the same review many different methods, such as different kinds of comprehensive interventions, early interventions, and/or behavioural and developmental interventions. The rest of the reviews (20/47, or 42%) focus on one of the following methods: technology-based interventions (e.g. virtual reality), physical activity, sensory-motor integration, intensive behavioural interventions, animal-assisted interventions, video-modelling, video-based instructions, social stories, robots, and facilitated communication (only one to four reviews are focussed on each method). Most reviews (39/47, or 83%) that address a wide range of difficulties find at least some positive effects of the methods studied on targeted issues to support the view that there are effective methods. However, the reviews that were focused only on facilitated communication (1 review) and robots (1 review) do not provide support for their effectiveness. Also, social stories were supported by one review but not by another, and sensory integration or sensory and motor

**Table 2.** Mapping of reviews that do not explicitly target inclusive education.

Reviews that include research in regular settings ( <i>N</i> = 42)	
Main outcomes	
Broad ( <i>N</i> = 24)	Antezana et al. 2017; Bellini and Akullian 2007; Boyd et al. 2010; Bremer et al. 2016; Corsello 2005; Gresham et al. 1999; Healy et al. 2018; Hendricks and Wehman 2009; Howlin et al. 2009; Kazdin and Weisz 1998; Koegel et al. 2000; Kokina and Kern 2010 Lang et al. 2010; Lang et al. 2012; Matson et al. 2007; Ospina et al. 2008; Peters-Scheffer et al. 2011; Reichow and Wolery 2009; Rogers 1998; Rogers and Vismara 2008; Smith 1999; Volkmar et al. 2004; Vismara and Rogers 2010.
Social and communication skills ( <i>N</i> = 12)	Cappadocia and Weiss 2011; Chang and Locke 2016; Bellini et al. 2007; Ganz, Davis et al. 2012; Ganz, Earles-Vollrath et al. 2012; Goldstein 2002; Howlin 1998; McConnell 2002; Rao et al. 2008; Reichow and Volkmar 2010; Shukla-Mehta, Miller, and Callahan 2010; Smith and Iadarola 2015.
Academics ( <i>N</i> = 3)	Keen, Webster, and Ridley 2016; King et al. 2016; Spooner et al. 2019.
Challenging behaviours ( <i>N</i> = 2)	Brosnan and Healy 2011; Machalicek et al. 2007.
Other ( <i>N</i> = 1)	DePape and Lindsay 2016.
Reviews that do not explicitly include research in regular education ( <i>N</i> = 35)	
Main outcomes	
Broad ( <i>N</i> = 23)	Ayres and Langone 2005; Baranek 2002; Campbell et al. 1996; Case-Smith et al. 2015; Chorpita et al. 2011; Diehl et al. 2012; Ferguson et al. 2019; Foley Nipcon et al. 2011; French and Kennedy 2018; Green and Garg 2018; Grynszpar et al. 2014; Hume et al. 2009; Mandy and Lai 2016; Matson et al. 1996; Mostert 2001; O'Haire 2013; O'Haire 2017; Parsons 2016; Podlesnik et al. 2017; Reichow et al. 2008; Reynhout and Carter 2006; Tanguay 2000; West et al. 2016.
Social and communication skills ( <i>N</i> = 9)	Hwang and Hughes 2000; Kagohara et al. 2013; Murza et al. 2016; Parsons and Mitchell 2002; Ploog et al. 2013; Tachibana et al. 2017; Tager-Flusberg and Kasari 2013; Wainer and Ingersoll 2013; Williams White, Keonig, and Scahill 2007.
Academics ( <i>N</i> = 2)	Knight, McKissick, and Saunders 2013; Root et al. 2017.
Challenging behaviours ( <i>N</i> = 1)	Turner 1999.

Note. Regular education = reviews that explicitly provide information that they partly or fully examine regular education; Broad = many different outcomes.

integration was supported by two reviews but not by another. In addition, four reviews contain discussions about effective methods without reporting the effectiveness of the methods.

### **Knowledge contributions of reviews targeting a specific outcome**

The rest of the reviews (30/77, or 39%) address one of these specific outcomes: socio-communicational skills, academic skills, and challenging behaviours. We begin with describing reviews that are delimited to targeting socio-communicational skills. Socio-communicational skills are the most common target among the reviews targeting a specific outcome (21 reviews). Most common among these reviews is to examine a wide range of methods for developing socio-communicational skills. However, about half of the reviews about socio-communicational skills examine only one of the following methods: technology-based interventions (e.g. virtual reality, smart phones, video instructions), group-based interventions, aided communication, peer-mediated interventions, and joint attention interventions. A majority (18/21, or 86%) of the reviews targeting

socio-communicational skills report at least some positive effects of interventions on socio-communicational skills. The exceptions are three reviews that show little or no support for the effectiveness of a wide range of methods.

Reviews that target academic skills study either the importance of a wide range of factors for general academic success or methods to teach maths. Three of the five reviews (60%) report positive effects of the interventions on academic skills. Technology-based interventions are supported in one review but not in another. In addition, one review describes different factors that might influence academic achievement. Only three reviews target challenging behaviours, and they examine different methods, including behavioural interventions, change in context, reinforcement, self-management, and contingency modification. All reviews targeting challenging behaviours report at least some positive effects of interventions on challenging behaviours. In addition to the reviews described so far, one review (DePape and Lindsay 2016) target the lived experiences of autistic individuals (the outcome is categorised as 'other' in Table 2). Note that the reviews that explicitly target inclusive education are summarised in a previous section.

### ***Summarising Conclusions about the Reviews Not Explicitly Targeting Inclusive Education***

The dominating contribution of the reviews is to the knowledge of how to meet the needs of the autistic individuals. A vast majority of the reviews describe their conclusions about the effectiveness of different methods as their main knowledge contribution. Most of the authors (63/77, or 82%) conclude that the methods examined in the reviews are effective for achieving the desired result for at least some autistic individuals. Few reviews (8/77, or 10%) examining effectiveness show little or no support for the effectiveness of different methods. Thus, despite the fact that they do not explicitly aim to contribute to the development of inclusive education, the reviews have some potential to contribute to our knowledge about how to increase inclusion, where inclusion is defined as placement in regular education and meeting the needs of the autistic pupils (see Table 1). On the other hand, various shortcomings revealed in the research make this conclusion less safe.

### ***Common shortcomings in first-level research as identified by review authors***

The same shortcomings in first-level research are recurrently identified by the authors of the reviews. Here we report shortcomings, together with examples of reviews from each time period. First of all, review authors state that more research and better research designs are needed (e.g. Keen, Webster, and Ridley 2016; Knight, McKissick, and Saunders 2013; McConnel 2002; Shukla-Mehta, Miller, and Callahan 2010; Smith 1999). For example, first-level research often uses weak experimental designs without random assignments of participants, making it difficult to compare contexts (e.g. Kokina and Kern 2010). It is also difficult to compare working methods (e.g. different interventions), as many methods include elements from other methods (e.g. Knight, McKissick, and Saunders 2013; Shukla-Mehta, Miller, and Callahan 2010). Second, little is known about generalisation and maintenance of skills (e.g. Matson et al. 1996; McConnell 2002; Podlesnik et al. 2017; Watkins et al. 2015; Williams White, Keonig, and Scahill 2007). Third, a research-to-practice gap shows that research about implementation and feasibility in regular education is needed (e.g. Howlin 1998; O'Haire 2013; Roberts and Simpson 2016; Rogers and Vismara

2008; Wainer and Ingersoll 2013; Volkmar et al. 2004). For example, teachers need knowledge, and the methods need to be time effective, inexpensive, easy to use and transferable over teachers. Fourth, no method fits all pupils. Research is needed on when a method is useful and about understudied groups of pupils (e.g. Goldstein 2002; Howlin et al. 2009; Murza et al. 2016; Smith and Iadarola 2015; Tanguay 2000). Fifth, research is needed on stake-holders' perspective(s), social validity, and collaboration across professions (e.g. Brosnan and Healy 2011; Campbell et al. 1996; Machalicek et al. 2007; Parsons and Mitchell 2002; Roberts and Simpson 2016).

## Discussion

This overview has mapped the knowledge contributions of much-cited reviews in WoS on education of autistic pupils to characterise the research and to analyse the potential of this research to develop inclusive education. It should be pointed out that these reviews are generally very well-conceived and follow high methodological standards. However, our aim in this overview is to point out potentials for development of the research field of inclusive education and we will thus take a partly critical stance. We will first raise four concerns in relation to the main results and then discuss the methodology used in this study.

Firstly, it is worrying that extremely few of the much-cited reviews aimed to study inclusive education. We used the Inclusive Education Model (IEM) to analyse the different knowledge contributions of different types of research. This showed that the reviews not specifically addressing inclusion can be helpful, nevertheless, for understanding how to meet the needs of autistic pupils. As stated in IEM, this is important knowledge contributions to develop inclusive education. The implications for inclusive education of knowledge obtained in non-inclusive contexts has however to be carefully considered. Ideally, such studies should be replicated in inclusive environments to strengthen their validity as regards the building of inclusive education (cf. Florian 2014; Nilholm and Göransson 2017). Secondly, the lack of knowledge contributions with regard to how the needs of all pupils, including autistic pupils, can be met and to how schools can proceed to work with the building of inclusive communities is troublesome. Most of the much-cited reviews concern how autistic individuals can change (learn, develop, etc.) and, thus, the reviews seldom challenge an image of a need to 'cure' autism (cf. Bottema-Beutel et al. 2021). Future studies and reviews would thus benefit from focussing to a higher degree on how environments can be adapted to better fit the needs of autistic pupils in addition to being beneficial to other students (cf. the second issue raised above).

Thirdly, even though many different methods were showed to be promising for meeting the needs of autistic pupils in the reviews, there is a need for information about how methods can be adapted to different contexts (cf. Roll-Pettersson, Olsson, and Ala'i-Rosales 2016), as well as information that help educators conclude what methods are most effective for which pupils and in which situations (even though there are some attempts to do so, Steinbrenner et al. 2020). This is further complicated by the fact that many methods have positive effects (cf. Odom et al. 2021; Sandbank et al. 2020; Steinbrenner et al. 2020). It seems that given the present state of knowledge, there is more negative evidence, that is, evidence of what does not work, than there is positive evidence for what works best for whom in specific situations. Further research that directly compares the effectiveness of different methods for different

groups of autistic pupils given different mediating factors is needed to inform educators about the best methods to choose. Fourthly, little attention was given in the high-cited reviews to individual experiences of pupils, to the subordination of autistic pupils and to the notion of able-bodiedness (cf. Bottema-Beutel et al. 2021; Parsons 2016). Reviews within the hermeneutical and the critical theoretical perspectives have potential to contribute with such knowledge (cf. Habermas 1987) but there were few such reviews in the sample of much-cited reviews.

To sum up, the major conclusions from this overview of high impact reviews in autism research, which was undertaken to reflect central issues in research about the education of autistic pupils, are that future research would benefit from: 1) Replicating findings within inclusive environments, 2) giving more attention to how learning communities involving all pupils (including autistic pupils) can be built, c) being more specific regarding in what circumstances specific methods work, and d) giving more attention to the viewpoints of autistic pupils and to able-bodiedness.

The use of the SMART approach allowed us to analyse different aspects of research. It should be pointed out, however, that SMART differs from other methodologies used at the overview level. Overviews in general are dominated by research within the functionalist perspective – most common are syntheses of meta-analyses (Polanin, Maynard, and Dell 2017). The functionalist perspective is most common within research on autism too, as shown in the current overview as well as in previous overviews (e.g. Krebs Seida et al. 2009; Reichow 2012) and recent reviews (e.g. Odom et al. 2021; Sandbank et al. 2020; Steinbrenner et al. 2020). The SMART approach is not intended to replace but rather to complement other approaches. While syntheses of meta-analyses focus on the question of what works, the present analysis started with the question of what researchers in a particular field are doing. The former question excludes some research in a given field by considering only subsets of the research to be relevant. The latter question is inclusive regarding different theoretical orientations. The current overview supports that interesting findings can emerge out of such an analysis. By examining different kinds of research, this overview has shown that IEM is suitable as a framework to described how different types of research (that do or do not explicitly address inclusion) may contribute to the development of inclusive communities (cf. Florian 2014; Nilholm and Göransson 2017).

Most-cited reviews in WoS were chosen because of WoS prestige (Birkle et al. 2020) and because citations show that the reviews have received attention from researchers and thus are ascribed importance by the research community. Future overviews could investigate whether the present findings remain if, for example, Scopus or Google scholar is used. It is again important to point out that our aim was not to overview research that explicitly address the inclusion of autistic pupils but to analyse how the research field concerned with the education of autistic pupils address the issue of inclusion.

Finally, we would like to highlight that a new methodological tool – the Inclusive Education Model (IEM) – was developed as a means of integrating research of different aspects of inclusive education. We believe that IEM can be useful in integrating research about other groups, too, even though this needs to be tested. Hopefully, future SMART analyses involving IEM may both deepen our knowledge about how more inclusive environments can be created and suggest how different research fields can be developed to generate more useful knowledge.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Funding

This work, as part of the research project 'Research about teaching e Mappingand analysis of research topographies', was financed by the Swedish ResearchCouncil.

## ORCID

Ingrid Olsson  <http://orcid.org/0000-0002-6519-8228>

Claes Nilholm  <http://orcid.org/0000-0001-8613-906X>

## References

- (The reference list of all the reviews included in the analysis is available as supplemental online material).
- Birkle, C., D. Pendlebury, J. Schnell, and J. Adams. 2020. "Web of Science as a Data Source for Research on Scientific and Scholarly Activity." *Quantitative Science Studies* 1 (1): 363–376. doi:[10.1162/qss\\_a\\_00018](https://doi.org/10.1162/qss_a_00018).
- Bottema-Beutel, K., S. K. I. Kapp, J. N. Lester, N. J. Sasson, and B. N. Hand. 2021. "Avoiding Ableist Language: Suggestions for Autism Researchers." *Autism in Adulthood* 3 (1): 18–29. doi:[10.1089/aut.2020.0014](https://doi.org/10.1089/aut.2020.0014).
- Brosnan, J., and O. Healy. 2011. "A Review of Behavioral Interventions for the Treatment of Aggression in Individuals with Developmental Disabilities." *Research in Developmental Disabilities* 32: 437–446. doi:[10.1016/j.ridd.2010.12.023](https://doi.org/10.1016/j.ridd.2010.12.023).
- Burrell, G., and G. Morgan. 1979. *Sociological Paradigms and Organizational Analysis. Elements of the Sociology of Corporate Life*. London: Heinemann.
- Campbell, M., E. Schopler, J. E. Cueva, and A. Hallin. 1996. "Treatment of Autistic Disorder." *Journal of the American Academy of Child and Adolescent Psychiatry* 35 (2): 134–143. doi:[10.1097/00004583-199602000-00005](https://doi.org/10.1097/00004583-199602000-00005).
- DePape, A.-M., and S. Lindsay. 2016. "Lived Experiences from the Perspective of Individuals with Autism Spectrum Disorder: A Qualitative Meta-Synthesis." *Focus on Autism and Other Developmental Disabilities* 31 (1): 60–71. doi:[10.1177/1088357615587504](https://doi.org/10.1177/1088357615587504).
- Dewey, J. 1966. *Democracy and Education: An Introduction to the Philosophy of Education*. New York: Free Press.
- Florian, L. 2014. "What Counts as Evidence of Inclusive Education?" *European Journal of Special Needs Education* 29 (3): 286–294. doi:[10.1080/08856257.2014.933551](https://doi.org/10.1080/08856257.2014.933551).
- Goldstein, H. 2002. "Communication Intervention for Children with Autism: A Review of Treatment Efficacy." *Journal of Autism and Developmental Disorders* 32 (5): 373–396. doi:[10.1023/A:1020589821992](https://doi.org/10.1023/A:1020589821992).
- Habermas, J. 1987. *Knowledge and Human Interest*. London: Heinemann.
- Harrover, J. K., and G. Dunlop. 2001. "Including Children with Autism in General Education Classrooms: A Review of Effective Strategies." *Behavior Modification* 25 (5): 762–784. doi:[10.1177/0145445501255006](https://doi.org/10.1177/0145445501255006).
- Howlin, P. 1998. "Practitioner Review: Psychological and Educational Treatments for Autism." *Journal of Child Psychology and Psychiatry and Allied Disciplines* 39 (3): 307–322. doi:[10.1017/S0021963097002138](https://doi.org/10.1017/S0021963097002138).
- Howlin, P., I. Magiati, T. Charman, and W. E. MacLean, Jr. 2009. "Systematic Review of Early Intensive Behavioral Interventions for Children with Autism." *American Journal on Intellectual and Developmental Disabilities* 114 (1): 23–41. doi:[10.1352/2009.114:23-41](https://doi.org/10.1352/2009.114:23-41).

- James, W. 1907. *Pragmatism: A New Name for Some Old Ways of Thinking*. Portland: Floating Press.
- Kazdin, I. E., and J. R. Weisz. 1998. "Identifying and Developing Empirically Supported Child and Adolescent Treatments." *Journal of Consulting and Clinical Psychology* 66 (1): 19–36. doi:[10.1037/0022-006X.66.1.19](https://doi.org/10.1037/0022-006X.66.1.19).
- Keen, D., A. Webster, and G. Ridley. 2016. "How Well are Children with Autism Spectrum Disorder Doing Academically at School? an Overview of the Literature." *Autism* 20 (3): 276–294. doi:[10.1177/1362361315580962](https://doi.org/10.1177/1362361315580962).
- Knight, V., B. R. McKissick, and A. Saunders. 2013. "A Review of Technology-Based Interventions to Teach Academic Skills to Students with Autism Spectrum Disorder." *Journal of Autism and Developmental Disorders* 43: 2628–2648. doi:[10.1007/s10803-013-1814-y](https://doi.org/10.1007/s10803-013-1814-y).
- Kokina, A., and L. Kern. 2010. "Social Story TM Interventions for Students with Autism Spectrum Disorders: A Meta-Analysis." *Journal of Autism and Developmental Disorders* 40: 812–826. doi:[10.1007/s10803-009-0931-0](https://doi.org/10.1007/s10803-009-0931-0).
- Krebs Seida, J., M. B. Ospina, M. Karkhaneh, L. Hartling, V. Smith, and B. Clark. 2009. "Systematic Reviews of Psychosocial Interventions for Autism: An Umbrella Review." *Developmental Medicine and Child Neurology* 51 (2): 95–104. doi:[10.1111/j.1469-8749.2008.03211.x](https://doi.org/10.1111/j.1469-8749.2008.03211.x).
- Lewin, K. 1951. *Field Theory of Social Science: Selected Theoretical Papers*, Edited by D. Cartwright. New York: Harper & Row.
- Machalicek, W., M. O'Reilly, N. Beretvas, J. Sigafoos, and G. Lancioni. 2007. "A Review of Interventions to Reduce Challenging Behavior in School Settings for Students with Autism Spectrum Disorders." *Research in Autism Spectrum Disorders* 1: 229–246. doi:[10.1016/j.rasd.2006.10.005](https://doi.org/10.1016/j.rasd.2006.10.005).
- Mandy, W., and M. C. Lai. 2016. "The Role of the Environment in the Developmental Psychopathology of Autism Spectrum Condition." *Journal of Child Psychology and Psychiatry* 57 (3): 271–292. doi:[10.1111/jcpp.12501](https://doi.org/10.1111/jcpp.12501).
- Matson, J. L., D. Benavidez, L. Stabinsky Compton, T. Paclawsky, and C. Baglio. 1996. "Behavioral Treatment of Autistic Persons" A Review of Research from 1980 to the Present." *Research in Developmental Disabilities* 17 (6): 433–465. doi:[10.1016/S0891-4222\(96\)00030-3](https://doi.org/10.1016/S0891-4222(96)00030-3).
- McConnell, S R. (2002). *Journal of Autism and Developmental Disorders*, 32 (5), 351–372. doi:[10.1023/A:1020537805154](https://doi.org/10.1023/A:1020537805154).
- Mostert, M. P. 2004. "Face Validity of Meta-Analyses in Emotional or Behavioral Disorders." *Behavioral Disorders* 29 (2): 89–118. doi:[10.1177/019874290402900205](https://doi.org/10.1177/019874290402900205).
- Murza, K A., J B. Schwartz, D L. Hahs-Vaughn, and C. Nye. (2016). Joint attention interventions for children with autism spectrum disorder: a systematic review and meta-analysis. *International Journal of Language & Communication Disorders*, 51 (3), 236–251. doi:[10.1111/1460-6984.12212](https://doi.org/10.1111/1460-6984.12212).
- Nilholm, C. , Göransson, K. Authors. 2017. "What Is Meant by Inclusion? an Analysis of High Impact Research in North America and Europe." *European Journal of Special Needs Education* 32 (3): 437–451. doi:[10.1080/08856257.2017.1295638](https://doi.org/10.1080/08856257.2017.1295638).
- O'Haire, M. E. 2013. "Animal-Assisted Intervention for Autism Spectrum Disorder: A Systematic Literature Review." *Journal of Autism and Developmental Disorders* 43: 1606–1622. doi:[10.1007/s10803-012-1707-5](https://doi.org/10.1007/s10803-012-1707-5).
- Odom, S. L. 2019. "Peer-Based Interventions for Children and Youth with Autism Spectrum Disorder: History and Effects." *School Psychology Review* 48 (2): 170–176. doi:[10.17105/SPR-2019-0019.V48-2](https://doi.org/10.17105/SPR-2019-0019.V48-2).
- Odom, S. L., L. J. Hall, K. L. Morin, B. R. Kraemer, K. A. Hume, N. S. McIntyre, S. W. Nowell, et al. 2021. "Educational Interventions for Children and Youth with Autism: A 40 Year Perspective." *Journal of Autism and Developmental Disorders* 51 (12): 4354–4369. doi:[10.1007/s10803-021-04990-1](https://doi.org/10.1007/s10803-021-04990-1).
- Parsons, S. 2016. "Authenticity in Virtual Reality for Assessment and Intervention in Autism: A Conceptual Review." *Educational Research Review* 19: 138–157. doi:[10.1046/j.1365-2788.2002.00425.x](https://doi.org/10.1046/j.1365-2788.2002.00425.x).
- Parsons, S., and P. Mitchell. 2002. "The Potential of Virtual Reality in Social Skills Training for People with Autistic Spectrum Disorders." *Journal of Intellectual Disability Research* 46 (5): 430–443. doi:[10.1016/j.edurev.2016.08.001](https://doi.org/10.1016/j.edurev.2016.08.001).

- Peters, M. D. J., C. Marnie, H. Colquhoun, C. M. Garrity, S. Hempel, T. Horsley, E. V. Langlois, et al. 2021. "Scoping Reviews: Reinforcing and Advancing the Methodology and Application." *Systematic Reviews* 10:263. doi:[10.1186/s13643-021-01821-3](https://doi.org/10.1186/s13643-021-01821-3)
- Podlesnik, C. A., M. E. Kelley, C. Jimenez-Gomez, and M. E. Bouton. 2017. "Renewed Behavior Produced by Context Change and Its Implications for Treatment Maintenance: A Review." *Journal of Applied Behavior Analysis* 50 (3): 675–697. doi:[10.1002/jaba.400](https://doi.org/10.1002/jaba.400).
- Polanin, J. R., B. R. Maynard, and N. A. Dell. 2017. "Overviews in Education Research: A Systematic Review and Analysis." *Review of Educational Research* 87 (1): 172–203. doi:[10.3102/0034654316631117](https://doi.org/10.3102/0034654316631117).
- Reichow, B. 2012. "Overview of Meta-Analyses on Early Intensive Behavioral Intervention for Young Children with Autism Spectrum Disorders." *Journal of Autism and Developmental Disorders* 42: 512–520. doi:[10.3102/0034654316631117](https://doi.org/10.3102/0034654316631117).
- Roberts, J., and K. Simpson. 2016. "A Review of Research into Stakeholder Perspectives on Inclusion of Students with Autism in Mainstream Schools." *International Journal of Inclusive Education* 20 (10): 1084–1096. doi:[10.3102/0034654316631117](https://doi.org/10.3102/0034654316631117).
- Rogers, S., and L. Vismara. 2008. "Evidence-Based Comprehensive Treatments for Early Autism." *Journal of Clinical Child and Adolescent Psychology* 37 (1): 8–38. doi:[10.1080/15374410701817808](https://doi.org/10.1080/15374410701817808).
- Roll-Pettersson, L., Olsson, I., and Ala'i Rosales, S. 2016. "Bridging the Research to Practice Gap: A Case Study Approach to Understanding EIBI Supports and Barriers in Swedish Preschools." *International Electronic Journal of Elementary Education* 9 (2): 317–336.
- Román, H., Sundberg, D., Hirsch, Å., Forsberg, E. Authors Nilholm, C. 2021. "Mapping and Analysing Reviews of Research on Teaching, 1980–2018, in Web of Science: An Overview of a Second-Order Research Topography." *Review of Education* 9 (2): 541–594. doi:[10.1002/rev3.3258](https://doi.org/10.1002/rev3.3258).
- Sandbank, M., K. Bottema-Beutel, S. Crowley, M. Cassidy, K. Dunham, J. Feldman, J. Crank, et al. 2020. "Project AIM: Autism Intervention Meta-Analysis for Studies of Young Children." *Psychological Bulletin* 146 (1): 1–29. doi:[10.1037/bul0000215](https://doi.org/10.1037/bul0000215).
- Schiro, M. S. 2013. *Curriculum Theory: Conflicting Visions and Enduring Concerns*. 2nd ed. CA: Sage.
- Shukla-Mehta, S., T. Miller, and K. J. Callahan. 2010. "Evaluating the Effectiveness of Video Instruction on Social and Communication Skills Training for Children with Autism Spectrum Disorders: A Review of the Literature." *Focus on Autism and Other Developmental Disabilities* 25 (1): 23–36. doi:[10.1177/1088357609352901](https://doi.org/10.1177/1088357609352901).
- Smith, T. 1999. "Outcome of Early Intervention for Children with Autism." *Clinical Psychology-Science and Practice* 6 (1): 33–49. doi:[10.1093/clipsy/6.1.33](https://doi.org/10.1093/clipsy/6.1.33).
- Smith, T., and S. Iadarola. 2015. "Evidence Base Update for Autism Spectrum Disorder." *Journal of Clinical Child and Adolescent Psychology* 44 (6): 897–922. doi:[10.1080/15374416.2015.1077448](https://doi.org/10.1080/15374416.2015.1077448).
- Steinbrenner, J. R., K. Hume, S. L. Odom, K. L. Morin, S. W. Nowell, B. Tomaszewski, S. Szendrey, et al. 2020. "Evidence-Based Practices for Children, Youth, and Young Adults with Autism." *National Clearinghouse on Autism Evidence and Practice Review Team*.
- Sucharew, H., and M. Macaluso. 2019. "Methods for Research Evidence Synthesis: The Scoping Review Approach." *Journal of Hospital Medicine* 14 (7): 416–418. doi:[10.12788/jhm.3248](https://doi.org/10.12788/jhm.3248).
- Suri, H., and D. Clarke. 2009. "Advancements in Research Synthesis Methods: From a Methodologically Inclusive Perspective." *Review of Educational Research* 79 (1): 395–430. doi:[10.3102/0034654308326349](https://doi.org/10.3102/0034654308326349).
- Tanguay, P. 2000. "Pervasive Developmental Disorders: A 10-Year Review." *Journal of the American Academy of Child and Adolescent Psychiatry* 39 (9): 1079–1095. doi:[10.1097/00004583-200009000-00007](https://doi.org/10.1097/00004583-200009000-00007).
- UNESCO. 1994. *The Salamanca Statement and Framework for Action on Special Needs Education*. Paris: UNES.
- Volkmar, F. R. 2020. "Editorial." *Journal of Autism and Developmental Disorders* 50: 2255–2279. doi:[10.1046/j.0021-9630.2003.00317.x](https://doi.org/10.1046/j.0021-9630.2003.00317.x).
- Volkmar, F., C. Lord, A. Bailey, R. T. Schultz, and A. Klin. 2004. "Autism and Pervasive Developmental Disorders." *Journal of Child Psychology and Psychiatry* 45 (1): 135–170. doi:[10.1007/s10803-020-04511-6](https://doi.org/10.1007/s10803-020-04511-6).

- Wainer, A. L., and B. R. Ingersoll. 2013. "The Use of Innovative Computer Technology for Teaching Social Communication to Individuals with Autism Spectrum Disorders." *Research in Autism Spectrum Disorders* 5 (1): 96–107. doi:[10.1016/j.rasd.2010.08.002](https://doi.org/10.1016/j.rasd.2010.08.002).
- Watkins, L., M. O'Reilly, M. Kuhn, C. Gevarter, G. E. Lancioni, J. Sigafoos, and R. Lang. 2015. "A Review of Peer-Mediated Social Interaction Interventions for Students with Autism in Inclusive Settings." *Journal of Autism and Developmental Disorders* 45 (4): 1070–1083. doi:[10.1007/s10803-014-2264-x](https://doi.org/10.1007/s10803-014-2264-x).
- Williams White, S., K. Keonig, and L. Scahill. 2007. "Social Skills Development in Children with Autism Spectrum Disorders: A Review of the Intervention Research." *Journal of Autism and Developmental Disorders* 37: 1858–1868. doi:[10.1007/s10803-014-2351-z](https://doi.org/10.1007/s10803-014-2351-z).
- Wong, C., S. L. Odom, K. A. Hume, A. W. Cox, A. Fettig, S. Kucharczyk, J. M. E. Brock, et al. 2015. "Evidence-Based Practices for Children, Youth, and Young Adults with Autism Spectrum Disorder: A Comprehensive Review." *Journal of Autism and Developmental Disorders* 45 (7): 1951–1966. doi:[10.1007/s10803-014-2351-z](https://doi.org/10.1007/s10803-014-2351-z).