STRATEGIES TO IMPROVE PARTICIPATION IN LEARNING IN CHILDREN AND ADOLESCENTS WITH AUTISM SPECTRUM DISORDER

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ABSTRACT

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Main title: Strategies to Improve Participation in Learning in Children and Adolescent with Autism Spectrum Disorder

Background: Limited research had been done about improving the learning ability of children and adolescents with autism spectrum disorder; among the very little work done, just few researchers involved the teachers in their empirical studies. Aim: To investigate how participation in learning is facilitated in children and adolescents with autism spectrum disorder. Method: ERIC and PsycINFO databases were searched to retrieve the information on the reviewed work. The study was limited to 2006-2016. Synonyms were used to obtain the correct search. The inclusion and exclusion criteria were observed. Protocol was used to assess the quality of the study. Result: Eight studies were included. Eight studies identified participation as their primary interests. Strategies for increasing participation were systematic text pattern interventions; adapted shared reading with visual support and dialogic reading with specific prompts; salient characteristics about the child and change in teachers’ preparation; use of story map, video social stories and scaffolding interventions; music therapy interventions. Conclusion: It is evident that children with autism’s characteristics and needs need more attention. This will enable the teachers have an insight on participation in learning in children and adolescents with autism in inclusive classroom. Implication: This implies that teachers in the society have a role to play in giving supports to enhance participation in learning in a positive manner in children and adolescents with autism in inclusive classroom.

Keywords: Strategies, Participation, Learning, Children and Adolescent, Autism

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# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of Contents</td>
<td>3</td>
</tr>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Background</td>
<td>1</td>
</tr>
<tr>
<td>Autism</td>
<td>1</td>
</tr>
<tr>
<td>Participation</td>
<td>2</td>
</tr>
<tr>
<td>Inclusive classroom</td>
<td>3</td>
</tr>
<tr>
<td>Experiences of children and adolescents with autism in the classroom</td>
<td>4</td>
</tr>
<tr>
<td>Facilitation</td>
<td>5</td>
</tr>
<tr>
<td>Aim and research question</td>
<td>5</td>
</tr>
<tr>
<td>Research Question</td>
<td>5</td>
</tr>
<tr>
<td>Method</td>
<td>5</td>
</tr>
<tr>
<td>Search strategy</td>
<td>5</td>
</tr>
<tr>
<td>Selection criteria</td>
<td>6</td>
</tr>
<tr>
<td>Title and abstracts screening</td>
<td>7</td>
</tr>
<tr>
<td>Full text screening</td>
<td>7</td>
</tr>
<tr>
<td>Data extraction and quality assessment</td>
<td>7</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>8</td>
</tr>
<tr>
<td>Results</td>
<td>11</td>
</tr>
<tr>
<td>Participant characteristics</td>
<td>11</td>
</tr>
<tr>
<td>Used strategies to improve participation in learning</td>
<td>13</td>
</tr>
<tr>
<td>The effectiveness of the strategies</td>
<td>15</td>
</tr>
<tr>
<td>Quality assessment</td>
<td>18</td>
</tr>
<tr>
<td>Discussions</td>
<td>20</td>
</tr>
<tr>
<td>Introduction of the discussion</td>
<td>20</td>
</tr>
<tr>
<td>Participants</td>
<td>20</td>
</tr>
<tr>
<td>Discussion of the used strategies to improve participation in learning</td>
<td>20</td>
</tr>
<tr>
<td>Systematic Text Pattern</td>
<td>21</td>
</tr>
<tr>
<td>Adapted Shared Reading and Dialogic Reading (with teacher’s prompts)</td>
<td>21</td>
</tr>
<tr>
<td>Salient characteristics of the student with autism and change in teacher preparation</td>
<td>22</td>
</tr>
<tr>
<td>Social Story Map with prompt, Video Social Stories and Scaffolding</td>
<td>24</td>
</tr>
<tr>
<td>Music therapy</td>
<td>24</td>
</tr>
<tr>
<td>Outcomes and Measures</td>
<td>24</td>
</tr>
<tr>
<td>Research Design</td>
<td>25</td>
</tr>
<tr>
<td>Limitations of the methodology</td>
<td>26</td>
</tr>
<tr>
<td>Future research</td>
<td>26</td>
</tr>
<tr>
<td>Conclusion</td>
<td>26</td>
</tr>
<tr>
<td>Reference list</td>
<td>27</td>
</tr>
</tbody>
</table>
**Introduction**

The children of a nation are its heritage, they are the spice of the society; they create room for continuity in the same society. They are the future generation of every nation. Children living with autism are by every right counted among the children of a nation and the nation should strive to identify where their problem lies in order that they may function optimally in the society where they belong (Simeonsson, 2015). The rationale behind this work stems from the fact that limited research has been done about improving the learning ability of children and adolescents living with autism spectrum disorder; among the very little work done, just few researchers involved the teachers in their empirical studies. Despite the fact that children living with autism spend a significant portion of their time in inclusive school programs; there is limited research documenting evidence based - intervention for this population (Adcock & Cuvo, 2009).

I hope that this systematic review will worth improving learning experiences for children with autism spectrum disorder by making teachers more aware of their roles and teaching practices to ultimately improve the quality of inclusive classroom; in realizing the positive difference in maximizing the potentials of children and adolescents living with autism (Granlund, 2013; Maxwell, Alves, & Granlund, 2012; Dawson & Osterling, 1996; National Research Council, 2001).

**Background**

**Autism**

“Autism Spectrum Disorder is a neurodevelopment disorder and it is characterized by deficit in social interaction, communication and unusual repetitive behavior” (Morrison & Parker, 2001). Autism is formally diagnosed before age four or infancy in some cases (Boyd, Odom, Humphreys & Sam, 2010). The degree of autism varies from mild to severe in different children. Severely affected children may be profoundly low as the cause of this condition yet to be understood (Leekam, 2007). Autism is borne out of genetic defects; it is not caused by emotional trauma (Whalon & Hart, 2011). Researchers have postulated that environmental factors may play an important role as well (Majoko, 2015; Granlund, 2013; Maxwell et al., 2012; Granlund, Wilder, Almqvist, 2013).

Auditory organ of some of children with autism are so sharp to the extent that they hear that somebody coughs, door is opening/closing, cell phone rings, fire truck outside, baby cries, somebody pouring water, siren of ambulances etc. They react to environmental noise (Holfield, Goodman, Hazelkorn & Heflin, 2010). They like to be independent. They like solitary play and reading. Children living with autism are shy, they do not want eye contact particu-
larly with unfamiliar person, want to stick with an adult, they go on tantrum, when they are denied of a thing at preschool, and some do not sensation of micturation or bruise anywhere on the body (Falkmer, Granlund, Nilhom & Falkmer, 2012).

No two children living with autism are alike and their disorder is multi-dimensional with four main indicators that include impairments known to accompany autism: learning, social competence; language and communication; and individual interest and sensory implications (Ouellette, Coo, Lloyd, Kasama, Holden & Lewis, 2007). They also find learning complex as they do not understand meaning behind the words expressed. Most of the time the auditory leaning strategy makes them bored but they could not convey their emotional feelings about it. They love to be active and participate but no one understands them (Odom, Rogers, McDougle, Hume, McGee & Blacher, 2007).

Learning impairment is the one of the great disorder in individuals with autism spectrum disorder (Carnahan et al., 2015; Mucchetti, 2013; Able et al., 2015; Stringfield et al., 2011). “Researchers estimated that 30% - 50% of individuals living with autism remain minimally verbal and a low learning abilities into school-age” (Adams, Gouvousis, VanLue & Waldon, 2004). “Classroom engagement is a powerful predictor of learning” (Mucchetti, 2013). “Engagement is a core deficit in autism with profound effects on learning” (Earles-Vollrath, Cook, Robbins & Arieh, 2008). Research on children with autism indicates that these children spend much of their school day unengaged from communicative or learning activities (Iovannone, Dunlap, Huber & Kincaid, 2003).

**Participation**

ICF –CY defined participation as “involvement in life situations” (WHO, 2001; 2007). At the same time, participation has been defined by researchers; that active participation that is beyond simply attending or being in the class but being engaged in the classroom; therefore defined participation as “being there and being engaged” (Granlund, Wilder & Almqvist, 2013; Maxwell et al., 2012). This implies that engagement in the classroom is one of the most critical features of children and adolescents with autism’s participation (Boutot & Bryant, 2005).

The act of reading and answering questions and contributing in the discussion in the classroom is also recognized as participation (Falkmer et al., 2012; Maxwell et al., 2012; Granlund et al., 2013). Researchers recognized that participation is potentially influenced by personal and environmental factors in the sense that there is need for someone in the child’s environment who prepares the classroom and facilitate the activity so as to increase presence and engagement in proximal process based on the child’s needs (Axelsson, Imms & Wilder, 2014).
**Inclusive classroom**

Salamanca declaration about inclusive schools was to ensure that every child attends the mainstream schools (UNESCO, 1994). However, the UN Conventional rights of person with disability also supported this by saying that every child has a right to education, right to participate, right to wellbeing, to feel secured, right to be wherever he/she wants to be and be comfortable (UN, 2007). This is why the inclusive school should be designed to meet the unique needs of students with autism, protect their interest and abilities and provision for their learning needs (Falkmer, 2013).

Inclusion has become a humanistic view at kindergarten level of individuals living with disability. It promotes self – determination and participation of individuals living with disability (Falkmer et al., 2012). Inclusion is more than simply placing children living with and without disabilities together (Bornman & Rose, 2010). According to ICF-CY (2007), inclusion is understood as a means to reduce the social environmental barriers to enable the participation of these children. Therefore it is suggested that instead of getting a child living with autism ready for an inclusive classroom, the inclusive classroom gets ready for the child (Maich & Belcher, 2012). Even with a better understanding of inclusion, the participation of children with special needs is expected to be a gain for typically developing children (Carnahan et al, 2015). Inclusion provides a challenge in teaching; requiring different methods, objectives setting. Inclusive classroom education deposits challenges to teachers’ practice (Randi, Newman & Grigorenko, 2010). Considerable research supports the idea that teachers begin to think about the appropriate intervention; strategy to facilitate participation of these children and adolescents with autism in inclusive classroom through the enabling environmental factors (Able, et al., 2015).

An inclusive classroom is a place where every student can learn emotionally and socially, where relationships are built, responsibility in helping others, individual learn from variety of sources where barriers are reduced to success, where students listen to others and where individual learn together and where learning are done in different directions (Allday, Gatti & Hudson, 2013). The dimension of the school environments determines the facilities that will be available within the environment (Chandler & Kluth, 2009). The level of the school based on the ages of children in the school; the preschool level, the primary level and the secondary level. Qualified trained teachers from special education schools; these teachers understand the philosophy of social inclusion (Boutot, 2007). Meanwhile, if the teacher understands that a student with autism is not a stranger in the class, but a member of the class whose contribution is needed in the on-going discussion in the classroom; this will promote a successful social inclusion for the child with autism (Boutot, 2007; Chandler & Kluth, 2009).
Experiences of children and adolescents with autism in the classroom

Research has shown that quite a number of children with autism develop skills needed to understand words but strive with reading comprehension (Brown, Oram & Johnson, 2013). They experience social anxiety and loneliness (Boutot & Hume, 2012). They have low learning standard, less social network, inappropriate teaching strategies, feedbacks are not given on assignments, seems people do not see that these children with autism are not engaged or participate in learning activities of the classroom.

Part of the experience is bullying, aggressive expression compared with their peers in the class. When these children with autism pants become wet or sustain bruises; they are unable to complain particularly those at preschool and primary school level (Wong & Kasari, 2012). These children or adolescents with ASD have personal challenges too but seems nobody knows (Falkmer et al., 2012). However,

Internationally, inclusion is steered by a range of initiatives, legislation and treaties that recognize the basic human rights of persons living with disability (UN, 2007). “Salamanca declaration also posited that all children must have equal access and opportunity to education in the mainstream”. However, there are key characteristics which support an inclusive school: making the environment warm, welcoming and supportive to all, equal opportunities and access to learning in ways that meet the needs of the individual student, issues of social reasoning and specific learning disabilities which creates stress for students on the spectrum (UNESCO, 1994). In addition, the school community environment addresses the unique learning needs and personal goals of children living with autism (Whalon & Hanline, 2008).

The five A’s of inclusive education about Falkmer is enumerated as follows: availability, accessibility, acceptability, adaptability/accommodability and affordability which is from the Frequency-Intensity model by Maxwell (2012). Falkmer used the model to explain how an inclusive classroom should be before it can fit for a child with autism. She explained these five environmental conditions can be regarded as the frequency of attendance which is mere presence of the child with autism in inclusive classroom.

Falkmer further explained a child being in the classroom alone does not make the child functions in everyday life. She mentioned that for a child’s participation to be improved the classroom has to be accommodating and acceptable which can be regarded as intensity of involvement in Maxwell model. When the school environment is available, accessible for the child with autism and the classroom is accommodating and acceptable then the environment will be fit for the child with autism (Maxwell et al., 2012). It is then the participation can be defined
in this context that a child with autism is being there and being engaged (Granlund et al., 2013). Inclusive schools work very hard to promote a culture that makes all students feel welcomed and respected. The goals are yet to be attained until when the strategies to improve participation in learning (being there and being engaged) can be used by teachers to facilitate participation among these children and adolescents living with autism in an inclusive classroom. Since participation is being there and being engaged; the environments need to provide for the learning needs of all students and enable them to achieve their maximum potentials (Granlund, 2015; Maxwell et al., 2012).

**Facilitation**

Facilitation is to make an activity, action or process possible or easier (Boutot, 2007). It provides the atmosphere to abate the difficulties in achieving a goal as special support in education of individuals with special needs. Facilitation in the classroom is a range of specialized techniques and innovations aimed at enhancing the learning ability children and adolescents with autism spectrum disorder. It includes structured and incentive teaching to elicit cognisance (Falkmer et al. 2012).

**Aim and research question**

To investigate how participation in learning is facilitated in children and adolescents with autism in inclusive classroom.

**Research Question**

- What strategies do teachers use to facilitate participation in learning in children and adolescents with autism in inclusive classroom?

- Are these strategies effective?

**Method**

**Search strategy**

The database search for this systematic review was performed in March 2016 using PsycINFO and ERIC advanced search. These databases integrate information from the fields of education and psychology. It included articles addressing teachers facilitating participation among children and adolescents living with autism in a range of environments. A study proto-
Operational definitions were determined for each aspect of the search that related to the research questions and selection criteria.

Thesaurus terms were searched to get the most suitable out of each database. Peer reviewed journals from 2006 – 2016, all in English language. The search terms were chosen based on the focus of the research question. It was an advanced search. The search words were formulated and two databases were used. ERIC was used because it is for education. PsycINFO was also used because it is for psychological reasoning; and it had some journals that answered the research question. The reviewer visited Cinahl but nothing was found to answer the research question.

Search limitations used for ERIC and PsycINFO were: Peer reviewed, Journal articles, Published 2006-2016 and accessible through JU.

Following specific search terms were used: autis*AND child* OR adolesc* OR youth OR student* OR pupil OR learn* OR teen*AND Strateg* OR support* OR increase* OR intervention* OR program* OR promot* OR “positive adaptation” OR “overcoming barriers” AND inclus* AND classroom AND involvement OR engagement OR particip* OR integrat* OR attendance OR presence

**Selection criteria**

Results of the search were used to answer the research question. Some authors defined participation as involvement in life situation according to ICF-CY; some were not specific about the definition, while some authors defined it as engagement of the children. The target population of this systematic review was children or adolescents with autism; therefore study was limited to those below 17 years of age. This was due to the developmental milestones and participation in general. The articles included were those that their participants were between 3 – 17 years of age. To ensure that information was not missed out, the study included articles that did not have research questions but a good aim and title, meaning that they also answered the research question and fulfilled the inclusion criteria.

Synonyms were used for the search during initial search, all intervention, strategies, promoting, improving, increasing, facilitating, helping, support, programming, integrating participation in children and adolescents with autism were included. Meanwhile, the reference list of the reviewer was checked to ensure that no important article was left out. The search was limited to articles published in the year 2006 – 2016. Peer reviewed journals were included in
the search. Other forms of literature review, case study or reports were excluded because they would not be buoyant enough to answer the research question.

**Title and abstracts screening**

All 115 hits were realized. Five duplicates were found and excluded. The remaining 110 were assessed for relevance of the study. An article was excluded because it was a case study (n=1). Article that was not original (n=1) was excluded. Articles that were not accessible at Jonkoping University (n=12). Articles reviewed for the titles and abstracts (n=96). When compared to inclusion and exclusion criterion, these articles were literatures that did not match the topic of the study and literate reviews and book chapters were excluded (n=56). Articles assessed for full text eligibility (n=40)

Of these (n = 30) was excluded during the review of full text; (n=8) because of not specifically discussing children and adolescents with autism but about general disability in children, (n=2) because they were above age range and (n=20) because they did not focus on strategies that the teachers used in the classroom. Studies thereafter considered for data extraction were (n = 10).

**Full text screening**

The ten articles that remained were carefully read and the reviewer discovered that (n=2) of the articles that were written on promoting the peer interaction did not involve the teachers. Many of the researchers did not allow the teacher to participate in some studies the teacher would just be there watching; so therefore the reviewer excluded these kind of articles because they would not answer the research question. The remaining articles used for the study were eight; these were the articles put into a protocol and evaluated to show the quality of the articles chosen.

Finally, the data extraction articles were (n=8), this was because the articles had specificity (autism), they had to do with strategies to improve participation in children and adolescents with autism in inclusive classroom; they had the quality to give answer to the research question. Included among these 8 articles, it was decided to keep one article only suggested teacher-student support needed for full inclusion students with ASD. It opposes the reviewer’s age limit, but the study had good content and focused on the research question; this was the reason why it was included. See figure 1.

**Data extraction and quality assessment**
The articles selected were given to another reviewer (a student) to check whether they answered the research question. This was to enhance the trustworthiness of the articles selected for quality assessment. The search terms were assessed severally to be able to get actual articles for the research question; other senior reviewer from the library in the field was invited to assess the search terms ensure the reliability of the systematic review.

During selection of articles for data extraction, the selected articles include the review of titles, abstracts and full texts; data extract and quality risk of bias were performed. At the point of the in-depth reading of full text, the reviewer discovered that some of the articles that were selected would not give an answer to the research question. This was why the reviewer had to change the inclusion criteria; and included preschool ages in the study. The selection criteria are shown in Table 1

**Data Analysis**

The search terms used gave 115 hits out of which 8 articles were extracted for data extraction and quality assessment. The articles used for the review were carefully read and screened. The articles were used to adapt the protocol for the study, and finally used the protocol as well as the articles to answer the research question.
Table 1. Inclusion and exclusion criteria

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age of children/adolescents:</strong></td>
<td></td>
</tr>
<tr>
<td>Range 3-17y.o.</td>
<td>Below or above age range</td>
</tr>
<tr>
<td><strong>Diagnosis:</strong></td>
<td></td>
</tr>
<tr>
<td>Autism, specifically (main focus)</td>
<td>Not specific (disabilities in general, dominance of other disabilities than autism)</td>
</tr>
<tr>
<td><strong>Teachers:</strong></td>
<td></td>
</tr>
<tr>
<td>Focus on teachers’ involvement in facilitating participation</td>
<td>No focus on teachers’ involvement in facilitating participation</td>
</tr>
<tr>
<td><strong>Focus:</strong></td>
<td></td>
</tr>
<tr>
<td>Focus on strategies for improvement</td>
<td>No focus on strategies for improvement</td>
</tr>
<tr>
<td><strong>Setting:</strong></td>
<td></td>
</tr>
<tr>
<td>Focus on inclusive classroom</td>
<td>No focus on inclusive classroom</td>
</tr>
</tbody>
</table>
Records identified through database searching (n=115) (71 ERIC + 44 PsycINFO)

Duplicates removed (n=5)

Records removed because case study (n=1)

Records removed because not original article (n=1)

Records removed because not accessible (n=12)

Records reviewed for title and abstracts (n=96)

Records excluded based on title or abstract (n=56)

Full-text articles assessed for eligibility (n=40)

Records excluded during review of full text (n=30)
Not about teacher’s role, not specifically about autism

Studies considered for data extraction (n=10)

Final records included in data extractions and quality assessment (n=8)

Record excluded during full text reading (n=2)
Didn’t involve the teachers
Results

**Participant characteristics**

Four studies include children with high or “higher” function autism (Carnahan et al., 2015; Stringfield et al., 2011 & Cihak et al., 2012; Williamson et al., 2015). Meanwhile, four of the studies include children with severe autism (Mucchetti, 2013; Fleury et al., 2014; Able et al., 2015; Kern et al., 2006).

All these participants received medical services and school services according to Individuals With Disabilities Education Improvement Act (IDEA, 2004) identification of autism (Carnahan et al., 2015; Williamson et al., 2015; Stringfield et al., 2011; Cihak et al., 2012; Mucchetti, 2013; Fleury et al., 2014 & Able et al., 2015). Except the children that are diagnosed by external agencies using standardized assessment tools (APA, 2000).

The persons included in intervention are 32 children and 49 teachers including 1 investigator. The ages of participants in the study vary: 3 years to 5 years; 4 years and 4 months to 5 years and 11 months; 6 years to 8 years; 7 years to 12 years; 15 years to 16 years and the exceptional case of the teachers of the children with autism, they are less than 30 years and 31 years to 50 years.

The diagnosis of the participant in each study and the level of severity are shown in Table 2.
<table>
<thead>
<tr>
<th>Study</th>
<th>Number of children/adolescents (age range)</th>
<th>Diagnosis</th>
<th>Classroom set up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carnahan et al., 2015</td>
<td>3 children (15yrs-16 yrs) 1 teacher</td>
<td>High functioning</td>
<td>Two of the students received instructions in self-contained resource classroom. One of the students was taught partly in general education classroom.</td>
</tr>
<tr>
<td>Mucchetti, 2013</td>
<td>4 children (6yrs-8 yrs) 3 teachers</td>
<td>Autism</td>
<td>Classroom run by teacher and 3 -5 instructional aides. A table and chair, one-one-one student-teacher intervention sessions</td>
</tr>
<tr>
<td>Fleury et al., 2014</td>
<td>3 children (4.4yrs-5.11yrs) 1 teacher</td>
<td>Autism</td>
<td>Treatment room, measuring 3m x 4m, adjacent to the classroom; child was given choice of reading on the floor or table</td>
</tr>
<tr>
<td>Able et al., 2015</td>
<td>34 teachers (Less than 30yrs, 31yrs-50yrs)</td>
<td>Autism</td>
<td>The focus group was held in a school at the closing time.</td>
</tr>
<tr>
<td>Stringfield et al., 2011</td>
<td>3 children (8.1yrs-11.2 yrs) 1 teacher</td>
<td>High functioning Autism</td>
<td>The task conducted in classroom from Monday to Friday. Tasks were assigned to individuals with varied disability. Participants exhibited varied difficulties in completing tasks in the classroom.</td>
</tr>
<tr>
<td>Cihak et al., 2012</td>
<td>4 children (7yrs-12yrs) 7 teachers</td>
<td>High functioning Autism</td>
<td>Two of the students received instruction from the same special education teacher but different Math teacher. The other two students received instructions from different special education teacher. Study was done in general education classroom.</td>
</tr>
<tr>
<td>Williamson et al., 2015</td>
<td>3 children (16yrs-17yrs) 1 teacher</td>
<td>Higher functioning Autism</td>
<td>Study took place in a language art block of the school. One of the student received instruction in general education while Two of the students received instruction in a resource room setting.</td>
</tr>
<tr>
<td>Kern et al., 2006</td>
<td>4 children (3yrs-5 yrs) 1 teacher</td>
<td>Autism</td>
<td>Care-playground measure 35m x 47m, having different areas of play. Classroom was self-contained.</td>
</tr>
</tbody>
</table>

12
**Used strategies to improve participation in learning**

The various strategies used by the teacher to enhance participation in learning in children and adolescents with autism in inclusive classroom that were found are:

- **Systematic text pattern.** This includes participation by reading aloud and discussing texts. This is the ‘Activity Schedule’ of graphic organizers and when it is properly implemented in classroom, it reveals students’ potential skills (Carnahan et al., 2015). The teacher asks the students to review the text aloud and summarize the text verbally. The teacher begins to ask the children 10 comprehensive questions prepared by the researcher these questions about the text; reviewed by the students. Responses from students are verbal. After this, this teacher directs the students’ attention to the pattern organization guide. Students verbally reviewed each of the text patterns by discussing the text pattern with the teacher. This increases participation in discussing text.

- **Adapted shared reading with visual support and Dialogic reading with specific prompts.** This includes participation in listening and answering questions about texts read by the teacher. Both interventions have to do with teacher’ specific prompting protocol, for students to be able to respond to questions asked from the text (Mucchet-ti, 2013; Fleury et al., 2014). The teacher makes the sentences very simple so that the students can understand. The teacher starts to read the book, and stop to ask questions about the text. She prompts if the child is going off task. When she finishes reading, the teacher asks the children the questions again. She keeps the book where the students cannot see the text. The students are given a response board that reveals the text visual and equipment that will match the events in the text. The teacher ask the questions again, when she waits for response from the students, for 5s and none of them does not answer or give an incorrect answer, the teacher models the question and ask the question again. When the teacher does not receive response for another 5 s. she will take the hand of this particular child and touch the object. The teacher reads the book during the reading; the teacher will prompt the child to ask questions about the characters of the book. Teacher continues reading; she asks an open end question so that the child will have to explain why and how. When the teacher asks question, she will pause for the student’s responses and when she does not receive response, she will continue reading.

- **Salient characteristics about the child and change in teachers’ preparation** for the student with ASD include knowledge about the child and adaptation of the environment for increased participation. This is done by making Individual Education Program (IEP) more accessible and useful, placing students with ASD in cooperative learning
group, parental-teacher advocacy and collaborative network between special and general educators. Based on the needs, social support are given to the students with autism like social relationship, where relationships are built between teachers and student with autism in order to make the environment adaptable and acceptable for the student. The academic supports are where the student with autism is helped by teachers in learning and reading; and on to the peers where the student with autism is emotionally and socially supported by peers in group reading or learning together. The self-advocacy is where the teachers make the environment adaptable and acceptable for student with autism in order for the student to speak for himself. The peer relationship is where the relationship between student with autism and peers are built by the teacher by making the environment acceptable and accommodating for the student with autism (Able et al., 2015).

- **Use of story map, video social stories and scaffolding intervention.** This includes teachers ‘use of social situations for increased participation in learning and reducing off-task behavior. Teacher instructs the students to look into the story book, she asks questions about the text; she waits for responses from the students for 30s. If she received the corrector incorrect answer or the students do not answer; she waits for another 30s before she turns to another page. She will not display the answer yet, she repeats the process the second time; if she did not receive answer from the students; she can point to the specific sentences, if the students did not respond or gave incorrect answer; the teacher reads the sentences aloud and instruct them to write the answers on the story map. In scaffolding the teacher distributes the Math work sheet to the student and asks them to start working on the sheets. The teacher moves away from the student like 5 feet; no eye contact, no attention given to anyone but when the off-task behavior starts the teacher prompts and move closer in order to redirect the students attention to the Math work. The teacher showers praise on any student that finishes the task. The teacher attitude towards these children is a plus to the cognitive development of the children. The students see the teacher as a mediator to every problem in their lives because; she will scaffold the activity first and then ask the students to do the same thing but in different way according to the students capacity and competence. A video social story is where another student acts the off-task behavior for the students with autism to see, and immediately the students with autism withdraw from the habit (Stringfield et al., 2011; Cihak et al., 2012 Williamson et al., 2015).

- **The music therapy intervention.** This includes children being involved in singing songs and playing instruments. It is where the teacher trains the peer buddies on 5 steps to an intervention condition which include enter musical hut with children, initi-
ate play, sing, play musical instrument and model content of songs. This improves participation by keeping all the children in hut and the teacher models a song that all of them know; they will start to sing together and when teacher decides to dance with the instrument available the children with autism too dance. When the teacher wants them all to play with instruments, these children with autism will like to play with the instruments. Little by little the children begin to learn from lyrics of the songs particularly when they are educative songs (Kern et al., 2006).

**The effectiveness of the strategies**

The strategies used in the studies are effective with positive outcome of the children and adolescents with autism spectrum disorder because the students interpret the texts with learning outcome. Engagements are high and there is enhancement of moderate behavior. Students with autism spectrum disorder are seduced with music and engage with instruments. Individual uniqueness is respected (Carnahan et al., 2015; Mucchetti, 2013; Fleury et al., 2014; Stringfield et al., 2011; Cihak et al., 2012; Williamson et al., 2015; Kern et al., 2006). The ensuing environment is expected to accommodate students with autism spectrum disorder (Able et al., 2015).
<table>
<thead>
<tr>
<th>Study</th>
<th>Definition of autism</th>
<th>Operationalization of participation</th>
<th>Strategies(interventions) including “how”</th>
<th>Length of interventions</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carnahan et al., 2015</td>
<td>“Students with ASD have differences in the areas social-communication restricted interests and/or repetitive behavior. Individuals with ASD demonstrate cognitive characteristics that may influence text comprehension and comprehension learning strategy”.</td>
<td>Involving in reading comprehension text aloud and summarizing the text verbally and discusses the text with the teacher.</td>
<td>Systematic text pattern intervention: teacher uses “Activity Schedule” or graphic organizers intervention strategy. When properly implemented in classroom, it reveals students’ potential skills.</td>
<td>Spring semester of the school year</td>
<td>Students with ASD were able to read science texts with high level of understanding.</td>
</tr>
<tr>
<td>Mucchetti, 2013</td>
<td>Communication impairments are a hallmark of autism spectrum disorder and many individuals have difficulty with language and communication throughout life.</td>
<td>Engagement of minimally verbal students with autism responding to questions asked by the teacher during the reading sessions.</td>
<td>Adapted Shared reading with visual support: Where teacher reads aloud to the children. Specific Activity Steps Prompting Protocol is employed by the teacher to elicit interaction in reading and to correct students’ responses to questions from text.</td>
<td>Short period</td>
<td>Engagements in the adapted activities are high in line with learning outcome.</td>
</tr>
<tr>
<td>Fleury et al., 2014</td>
<td>Children with ASD have difficulty in communication, social interaction, exhibit delay in receptive and expressive language development and have difficulty in other language and gestures.</td>
<td>Encouraging interaction through asking questions or engaging in discussion about the book.</td>
<td>Dialogic Reading with specific question prompts. Teacher attends to a child’s comment while reading and discusses characters and pictures.</td>
<td>9 sessions in 5 week periods</td>
<td>Each student responses to specific dialogic reading with distinguish prompts.</td>
</tr>
<tr>
<td>Able et al., 2015</td>
<td>“Autism is defined as individuals with deficits in social skills, communication with restricted interests or repetitive behaviors due to the deficits in social communication and interaction, navigating peer relationship and other classroom social situations can be very difficult even students with ASD have average to cognitive skills, they struggle with school success because of challenges in social cognition.”</td>
<td>Students with autism being on playground alone or they engage in a fantasy world.</td>
<td>Salient characteristics of the student with ASD. Making Individual Education Program (IEP) more accessible and useful. Social support needs, Changes in teachers’ preparation. Placing students with ASD in cooperative learning group. Parental-teacher advocacy and Collaborative network between special and general educators. Teachers mention the needs and the things that are to be changed: Social relationship, Social academics, Self-advocacy,</td>
<td>1 year</td>
<td>Environment should accommodate students with autism. More research on academic related challenges in inclusive classroom. The most effective and efficient support strategies to enable students with autism benefit in inclusive classroom.</td>
</tr>
<tr>
<td>Reference</td>
<td>Description</td>
<td>Transitioning and Peer related needs</td>
<td>Duration</td>
<td>Outcome</td>
<td></td>
</tr>
<tr>
<td>------------</td>
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<td></td>
</tr>
<tr>
<td>Stringfield et al., 2011</td>
<td>“Autism is a complex developmental disability identified by restricted behavior patterns and qualitative impairments in social interaction and communication”. “Children with high functioning autism have difficulty with cognitive flexibility, planning and working memory”.</td>
<td>Attended the teacher’s instruction for 10 minutes in reading and answering questions from accelerated reader quizzes.</td>
<td>3 consecutive days</td>
<td>Students with autism are able to recall Story information, text responses are increased in reading text.</td>
<td></td>
</tr>
<tr>
<td>Cihak et al., 2012</td>
<td>“ASD demonstrate a triad of characteristics along a continuum of communication skills, social skills and restricted repertoires of behaviors, interests and activities”.</td>
<td>Student task-engagement and off-task behavior; students having as pencil on a paper solving Math problems or raising their hands and asking for either help or a brief break.</td>
<td>No information</td>
<td>Engagement is improved, moderate behavioral outcome after video social stories.</td>
<td></td>
</tr>
<tr>
<td>Williamson et al., 2015</td>
<td>“Cognitive, social interaction and communication are the difficulties documented with ASD, for many individuals with higher functioning predicted by intellectual level is not met”.</td>
<td>Students were highly engaged while reading and during the discussion period, they were able to interpret and comprehend the text.</td>
<td>4 weeks</td>
<td>Students with higher functioning can easily interpret the characters, reasoning with ease.</td>
<td></td>
</tr>
<tr>
<td>Kern et al., 2006</td>
<td>“Autism is a complex developmental disorder that affects verbal and non-verbal communication and social interaction, associated with restricted and repetitive pattern of behavior usually evident before age 3”.</td>
<td>To involve the children in singing the song and playing the instrument.</td>
<td>8 months</td>
<td>Children with autism are seduced by sound, and play with instrument for short period.</td>
<td></td>
</tr>
</tbody>
</table>

**Story Map Intervention (with teacher’s prompts).** Teachers score students on accelerated reader quiz laptop and give the masked Story Map to students. Correction of answers is made using unmasked Map.

**Video Social Stories**
Teacher uses physical proximity, voice and visual sensation to give direction to task. Praise is showed only on students who finish task positively.

**Scaffolding intervention**
Typical procedures allow teacher to select appropriate social interaction text and lead by encouraging students and giving correct information (on who, where, and what of an event).

**Music therapy intervention**
Teacher trains peer buddies on 5 steps to an intervention condition which include Enter music hut with children. Initiate play, Sing, Play musical instrument and Model content of songs.
Quality assessment

According to “Can Child Centre for Childhood Disability Research Institute of Applied Health Sciences, McMaster University rating” (Law, 1987). A study can be rated by excellent, adequate or poor. It is excellent when it is clear comprehensive concise and available, adequate when it is clear, concise but lacks some information, poor when not clear and concise or not available.

According to Law (1987), the reviews can have primary or secondary focus on participation as detailed in table 4. The basic design used for the study and clarity of instructions of studies can be implicit or explicit. The explicit weighting takes place when an item or score is multiplied by a factor to weigh its usefulness. Population diagnosis is the description of the included children. Active participation of clients’ show whether the completion of measures require the clients to participate verbally or physically.

The author of this review found the basic design of the included articles to be excellent. Eight studies focus are rated excellent, because of their primary interest in participation (Carnahan et al., 2015; Mucchetti, 2013; Fleury et al., 2014; Able et al., 2015; Stringfield et al. 2011; Cihak et al., 2012; Williamson et al., 2015; Kern et al., 2006).

Seven studies are rated excellent in the description of included children diagnoses (Carnahan et al., 2015; Mucchetti, 2013; Fleury et al., 2014; Stringfield et al., 2011; Cihak et al., 2012; Williamson et al., 2015 & Kern et al., 2006) and in one article this information was lacking (Able et al., 2015). Seven of the studies are excellent in explicit approach/Clarity of Instructions (Canahan et al., 2015; Mucchetti, 2013; Fleury et al., 2014; Stringfield et al., 2011; Cihak et al., 2012; Williamson et al., 2015 & Kern et al., 2006) and in one article this information was lacking (Able et al., 2015).

Seven studies are excellent in explicit weighting (Carnahan et al., 2015; Mucchetti, 2013; Fleury et al., 2014; Stringfield et al., 2011; Cihak et al., 2012; Williamson et al., 2015 & Kern et al., 2006) and in one article this information was lacking (Able et al., 2015). Six studies are excellent in outcome measures of learning abilities of children with autism (Carnahan et al., 2015; Mucchetti, 2013; Fleury et al., 2014; Stringfield et al., 2011; Williamson et al., 2015; Cihak et al., 2012). The remaining two studies are adequate in outcome measures of learning ability of children with autism (Able et al., 2015; Kern et al., 2006). See table 4.
Table 4. Quality assessment of the studies using Outcome Measuring Rating Form Guideline (Law, 1987).

<table>
<thead>
<tr>
<th>Author</th>
<th>Country</th>
<th>Focus on participation as primary interest</th>
<th>Basic Design</th>
<th>Description of included children diagnoses</th>
<th>Explicit Approach/Clarity of instruction</th>
<th>Explicit weighting</th>
<th>Outcome measures on learning ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carnahan et al., 2015</td>
<td>USA</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td>Mucchetti, 2013</td>
<td>USA</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td>Fleury et al., 2014</td>
<td>USA</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td>Able et al., 2015</td>
<td>USA</td>
<td>Excellent</td>
<td>Excellent</td>
<td>No information</td>
<td>No information</td>
<td>No information</td>
<td>Adequate</td>
</tr>
<tr>
<td>Stringfield et al., 2011</td>
<td>USA</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td>Cihak et al., 2012</td>
<td>USA</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td>Williamson et al., 2015</td>
<td>USA</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td>Kern et al., 2006</td>
<td>USA</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Adequate</td>
</tr>
</tbody>
</table>
Discussions

Introduction of the discussion

The systematic review identified 40 studies that aimed at investigating how participation is facilitated in children and adolescents with autism in inclusive classroom. Only 8 studies were suitable for data extraction; they were the studies that gave answers to the research question. The result from the studies had shown various strategies that could be used to facilitate participation among the students with autism in the classroom. Systematic text pattern interventions, adapted shared reading with visual support and dialogic reading with specific prompts, salient characteristics about the child and change in teachers’ preparation, use of story map, video social stories and scaffolding interventions and music therapy interventions.

Participants

The facts presented in this review provide support for uniqueness of individual functional level (Carnahan et al., 2015; Mucchetti, 2013; Fleury et al., 2014; Able et al., 2015; Stringfield et al., 2011; Cihak et al., 2012; Williamson et al., 2015 & Kern et al., 2006). Diagnosis of students were known under the (IDEA, 2004) and (APA, 2000), numbers of students used in the studies, gender of students and the number of people in the intervention were mentioned in the studies (Carnahan et al., 2015; Mucchetti, 2013; Fleury et al., 2014; Able et al., 2015; Stringfield et al., 2011; Cihak et al., 2012; Williamson et al., 2015 & Kern et al., 2006).

The studies that fulfilled the inclusion criteria elaborate the participation of children and adolescents with autism differently and in a broad way. Four studies focus on high or higher functioning autism (Carnahan et al., 2015; Stringfield et al., 2011; Cihak et al., 2012; Williamson et al., 2015). Four studies on severe autism (Mucchetti, 2013; Fleury et al., 2014; Able et al., 2015 & Kern et al., 2006). The eight studies revealed that children with autism demonstrate participation irrespective of the grade of autism (Carnahan et al, 2015; Mucchetti, 2013; Fleury et al., 2014; Able et al., 2015; Stringfield et al., 2011; Cihak et al., 2012; Williamson et al., 2015 & Kern et al., 2006).

Discussion of the used strategies to improve participation in learning

In this discussion section, the result will mainly be discussed in relation to Maxwell et al, (2012) 5 A’s environmental conditions. In these availability and accessibility are about fre-
frequency of attendance which is the sociological perspective of participation. Acceptability and adaptability/accomodability are about intensity of involvement which is the psychological perspective of a child with autism spectrum disorder. Affordability is the effort given to these children and adolescents whether it worth it or not. This Maxwell model was adopted by Falkmer et al., (2012) into inclusive classroom.

**Systematic Text Pattern**

The systematic review study, found that systematic text pattern can be used as a strategy by teachers to improve participation in inclusive classroom (Carnahan et al., 2015). Compare to the definition of participation in the literature that said in order to enhance participation among these students with autism the two out of five environmental conditions for participation namely availability and acceptability have to be in place (Falkmer et al 2012). Availability relates to the activity in the classroom and associates with the frequency of attending (Maxwell et al., 2012). According to Carnahan et al (2015) the strategy is to teach the students with autism to enhance the learning potentials in these children (Granlund, 2013; Maxwell et al., 2012; Dawson & Osterling, 1996; National Research Council, 2001). The environment that is acceptable and accommodating enables the children to perform excellently (Falkmer et al., 2012). The literature also supported this fact by Maich & Blecher (2012) that the inclusive classroom should be ready for the child and not the child with autism ready for the classroom. Carnahan et al. buttresses the fact that inclusive classroom should be a place where every student can learn emotionally and socially, learn in different directions like the students are asked to review a text and summarize the text verbally and at the time ask them questions that are answered verbally. In some occasions students are asked to write in the paper but this study gives the option of learning in different direction, it may due to uniqueness of children or level of competence (Falkmer et al., 2012). The systematic text pattern has to be acceptable to the students with autism that is interesting, success that removes barriers, social (Allday et al., 2013). This aspect relates to the student with autism ‘intensity of involvement while being in the activity” as discussed by (Maxwell et al., 2012).

**Adapted Shared Reading and Dialogic Reading (with teacher’s prompts)**

Adapted shared reading, dialogic reading with teacher’s prompts was found to be a strategy to be used by teachers to improve participation in inclusive classroom (Mucchetti, 2013 & Fleu-
This strategy can be related to a literature that said there is need for somebody in the child’s environment who prepares the classroom and facilitate the activity so as to increase presence and engagement in proximal process based on the child needs (Axelsson et al., 2014). Another literature said classroom’s engagement is a powerful predictor of learning (Mucchetti, 2013). This strategy was another way to improve learning abilities in children with autism; the adapted shared reading as the name implies; that the environment has to adapt the children (Maxwell et al., 2012). The environment was accommodating that was the reason the students answer the questions that were promptly asked by the teacher (Falkmer et al., 2012). The environment was acceptable for the students with autism that was why they performed excellently well (Falkmer et al., 2012). The dialogic readings also facilitate the learning abilities of the students because their teachers were trained and qualified teachers from special education school (Boutot, 2007; Chandler & Kluth, 2009). This study also proved the literature might be right in Wong & Kasari (2012) that the children with autism were not engage particularly in learning activities of the classroom; but Mucchetti (2013) and Fleury et al., (2014) instructed the teachers in inclusive classroom to use the strategies with specific prompts, to ensure the engagement of the students with autism. Each time the students wanted to go off-task, the teachers used this prompts to redirect the students with autism. Mucchetti and Fleury et al. might be right in this regard.

Salient characteristics of the student with autism and change in teacher preparation

When there was knowledge about the child, it would help the teachers accommodate the child; building relationship that facilitate the learning ability (Able et al., 2015; Brown et al., 2013; Falkmer et al., 2012). Making the Individual Education Program accessible and useful. This would create the opportunity for the child to reach the school classroom (accessibility) and when it was useful in knowing the child needs; it would promote the learning and gave room for adaptability (Falkmer et al., 2013; Boutot & Hume, 2012).

Change in preparation of teachers was the environmental change of teachers’ attitude towards the student of autism and peer attitude towards bullying students with autism. When the environment was acceptable and accommodating the student with autism and their caregiver would realize that the classroom was ready for the students with autism and not the students with autism ready for the classroom (Maich & Belcher, 2012; Falkmer et al., 2012; Boutot, 2007). According to Falkmer et al., (2012) when the environment was acceptable and adapta-
ble for students with autism it would be easier to place students with ASD in cooperative learning with peers in inclusive classroom. Allday et al., (2013) was in support of the statement made by Falkmer et al., (2012) that inclusive classroom is a place where students listen to each other and where individuals learned together and learning could be done in different direction. Adult that was familiar with the child would be the one to explain all attributes or characteristics of the child and needs so that the child could receive a proper attention to be able to adapt with the classroom (Falkmer et al., 2012; Able et al, 2015).

Collaborative network between special and general educators would enable the teachers know more about the needs regarding the child learning abilities. Coming together of these teachers to deliberate upon how the inclusive classroom should be organized to suit the child with autism was a salient point in the environmental conditions mentioned by Falkmer et al., (2012). Falkmer mentioned that when the environment really understood the child and the needs of the child invariably the environment would be adaptable and acceptable for the child with autism in the classroom.

Social support needs like social relationship with the teacher, it was said in the literature that children with autism liked to stick with adult (Falkmer et al., 2012). When the environment of classroom was available for the child with autism, since it was already known that sticking with adult was one the attributes then the teacher would have to make herself available for child with autism to be able to participate in learning in the classroom (Falkmer et al., 2012). Social academic was an important issue in this study, the environment had to strive very hard to ensure that it was acceptable for the child with autism whereby the child could feel relax and belong in the classroom to enable the child enjoyed the benefit of inclusive classroom; it also said in the literature that the child had to belong to the classroom (Falkmer et al., 2012). Self-advocacy was when the child with autism was enabled to speak for him or herself what he/she wanted, where she preferred to be (UN, 2007). In peer-related needs; the environment would ensure a cordial relationship. An example of this was an inclusive classroom, which was a place that built relationship and a place where student help each other or learn together (Allday et al., 2013).
Social Story Map with prompt, Video Social Stories and Scaffolding

The strategy helped students with autism in developing their skills because the classroom was acceptable and adaptable for these children and adolescent with ASD. They were able to identify words the children with autism did not struggle with reading comprehension this was on contrary opinion to Brown et al.,( 2013); Wong & Kasari, (2012). This strategy had created a way to reduce the problem of decoding behind words for students with autism by instructing the students to look into their books and teacher asked question about the text and the students’ performances were excellent (Stringfield et al., 2015; Cihak et al., 2012; Williamson et al., 2015). However, this study was on contrary opinion that students with autism are left unengaged in the classroom by Wong & Kasari (2012) in the literature.

Music therapy

This was a strategy that promote social interaction and communication participation in students with autism (Kern et al., 2006). The literature that said that individual learned in different direction (Allday et al., 2013). Some students might learn through music; some might learn through visuals. Research in the literature indicated that children with autism spend much of their school day unengaged (Iovannone et al., 2003). Students with autism can be engaged through listening to music and playing the instrument (Kern et al, 2006). The literature also revealed that a student with autism loved to be active and participate but seemed no one understood her (Odom et al., 2007). View from the theory of Maxwell, one would see that the environment must have accepted and adapted the students with autism that was why it was possible to engage these children in music and playing the instrument. When the environment was able to provide all these environmental conditions; it would be evident that supportive strategies worth affordable in participation in learning of these children and adolescents with autism spectrum disorder in inclusive classroom (Maxwell et al., 2012; Falkmer et al., 2012).

Outcomes and Measures

The studies had operationalized terms for participation. It was evident in the eight studies that they had primary interest in participation outcomes (Carnahan et al., 2015; Mucchetti, 2013; Fleury et al., 2014; Able et al., 2015; Cihak et al 2012; Stringfield et al., 2011; Williamson et al., 2015; Kern et al., 2006).
Based on the outcome of the eight studies; it could be seen that the outcomes were participation based. Children with autism were able to gain science texts with high levels of understanding (Canahan et al., 2015). Engagements in adapted activities were high in line with learning outcome (Mucchetti, 2013). Each response to specific dialogic with distinguish prompts (Fleury et al., 2014). Students with autism were able to recall Story information; text responses were increased in reading (Stringfield et al., 2011). Engagement was improved and moderate behavioral outcome (Cihak et al., 2012). Students with higher functioning could easily interpret the character and reasoned with ease (Williamson et al., 2015). Children with autism were seduced by sound and played with instrument for short period (Kern et al., 2006). The only study about teachers was different, the outcomes were: Environment should accommodate students with autism, more research on academic related challenges in inclusive classroom, the most effective and efficient support strategies to enable students with autism benefit in inclusive classroom (Able et al., 2015).

The studies were based on baselines, just three studies used specific tool to measure participation of children with autism. One of the studies used brief functional analysis (BFA) to measure participation (Cihak et al, 2012). Another study used accelerated reader (AR) to measure participation (Springfield et al., 2011). While one study used Text Structure Organization Guide to effect participation (Carnahan et al, 2015). The remaining four studies used percentage of non-overlapping in their calculations. While the last study; which was number eight of the included articles used content analysis to analyze the results.

**Research Design**

This review used excellent studies designs according to the author of this review. Possibly to have excluded studies that were important. Eight studies focused on participation. A study that was exceptional on teachers of the children with autism still focused on how the participation can be facilitated among the children with autism in inclusive classroom. Five studies used multiple baseline design (Carnahan et al., 2015; Mucchetti, 2013; Stringfield et al., 2011; Cihak et al., 2012& Williamson et al., 2015). Two of the studies used single baseline design (Fleury et al., 2014; Kern et al., 2006). A study used focus group discussion(Able et al., 2015).
Limitations of the methodology
The restriction from the library that the only databases that were recommended were ERIC, PsycINFO and Cinahl. The articles obtained for the study might not be only available articles. There were some good title articles that were not accessible at JU. Most of the articles available did not involve teachers in their empirical study. The teachers would just be observing in the classroom while the researcher took over the teacher’s role. Articles that really focused on children with autism learning participation in the classroom were not found; the reviewer only managed the studies used for data extraction. All of the studies were done with small number of children, which make it difficult to generalize. Research could be done on a large number of participants to know if intervention would work.

Future research
Research has to be done on learning ability of children with autism. Any intervention to be done on this should be simple so that the teachers can begin to use the strategy immediately with children and adolescents with autism spectrum disorder in inclusive classroom. Research must continue on dialogic and discussion where teacher strategically engage with the students with autism. There is need to ensure that everyone in inclusive classroom participates. Students with autism will be asked questions that prompt discussion. Discussion then becomes a great facilitator for these children and adolescents with autism spectrum disorder. Research could be done on a large number of participants to ascertain workability of intervention.

Conclusion
As a result of all these strategies, everyone would agree that the effort of making a child or adolescent with autism participates in inclusive classroom worth providing the support. The researchers that recognized the fact that participation is potentially influenced by personal and environmental factors were right. It is evident that children with autism characteristics and needs need more attention. This will enable the teachers have an insight on participation of the students with autism in inclusive classroom. This implies that teachers in the society have a role to play in giving supports to enhance learning participation in a positive manner in children and adolescent with autism.
Reference list


Bornman, J., & Rose, J. (2010). *Believe that all can achieve: Increasing classroom participation in learners with special support needs*. Van Schaik.


