Examining Classroom Supports Systems and Learning Outcomes Among Learners with Autism Spectrum Disorders in Primary Schools

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Abstract: This study examined the relationship between classroom supports systems and learning outcomes among autistic learners in Kenya. The correlational research design was adopted. A sample size of 200 teachers was obtained from the study population using proportionate sampling technique. Classroom learning Supports Systems Questionnaire and Learning Outcomes Assessment scales were used to collect data. The reliability of the questionnaires was ensured by the Cronbach's alpha and an alpha of above 0.70 was reported for all the scales. Inferential statistics such as the Pearson Correlation Coefficient and Regression analysis were used to analyze data. The results indicate that the Regression model output, explains 35.6 percent of the variance in learning outcomes among learners with Autism spectrum disorders. The Individualized Education Program had the highest influence (Beta=.389) on learning outcomes, while use of instructional supports made the least contribution (Beta=.006) to explain the variability. The study recommends that the Kenyan Ministry of Education should post speech and language therapists to schools for learners with autism to help them improve and overcome the communication difficulties they face.

Key words: Classroom Learning Supports Systems, Learning Outcomes, Autism Spectrum Disorders, Kenya

1. Introduction

Autism Spectrum Disorders (ASD) is a neurodevelopmental disorder and is characterized by severe and pervasive impairments in reciprocal socialization, qualitative impairment in communication, and repetitive or unusual behavior (Levy et al., 2009). Autism affects 1 in 68 children. It impacts children's ability in school in within a wide range of social, academic, behavioral and other needs (Bruck et al., 2014). Due to the unique social and educational needs of this group of students, classroom teaching therefore would only be effective for the students if these areas of deficits are addressed through appropriate classroom supports systems. Students with autism spectrum disorder are increasingly being placed within mainstream classes (Lindsay et al., 2013). With more students with autism spectrum disorder in mainstream classrooms, teachers are expected to be well equipped with strategies to handle students with autism spectrum disorder in the mainstream class. Researchers such as (Horrocks et al., 2008; Lindsay et al., 2013) have indicated that many teachers struggle to meet the needs of students with autism spectrum disorder. In light of that

appropriate classroom supports systems is critical to students with autism spectrum disorder.

Smith and Eikeseth (2010) argued that students with autism spectrum disorder can benefit from a more typical education setting if they are being provided with appropriate educational and intentional experiences in the early stages of their education.

Studies on interventions for learners with autistic spectrum disorders have been reported. Crockett et al., (2007) successfully used video modeling as a training component to teach parents of young children with autistic spectrum disorders. Parents rapidly acquired teaching skills and, importantly, after just two training examples generalized their teaching to new child behaviors targeted for teaching. Virues-Ortega, (2010) demonstrated the effectiveness of Applied behavioural analysis intervention in the treatment of autistic spectrum disorders whether pre and post-intervention methodology or group designs were used to evaluate effectiveness. Eikeseth and Klintwall (2014) demonstrated that Early Start Denver Model (ESDM) may produce significant increases on standard scores in both intellectual functioning and adaptive functioning, as well as reductions in autistic symptoms and aberrant behaviors. Another recent comprehensive intervention, the Early Start Denver Model (ESDM), carries considerable promise. Edwards, et al., (2018) reported that using backward chaining procedures combined with differential reinforcement and blocking the occurrence of stereotypy, the authors increased functional leisure skills of all participants and two of the three demonstrated reductions in stereotypical behavior. Ladarola et al., (2018) reiterate that manualized treatments are highly useful because they fully describe the intervention activities and the sequence in which treatments should be implemented. Manualization likely contributed to teachers' ability to increase their level of treatment fidelity over time. Koegel et al., (2018) demonstrated that including these intense interests increased peer social interaction during activities that had a positive history for the participants but did not have this effect during activities with a more negative history. However, the classroom supports systems have received little attention.

Classroom supports systems are designed to minimize obstacles to learning or participating in the educational environment. The classroom learning Supports systems a student with autism spectrum disorders receives largely depends on the student's needs and goals set in the Individualized Education Program (IEP). Many of the Classroom Supports systems for students with autism spectrum disorder emphasize visual learning. In this paper the classroom supports systems that were investigated comprised instructional supports, environmental supports, social supports and Individualized Education Program (IEP). The government of Kenya has put in a lot of effort to increase access to education of learners with special needs. In line with the children's rights, Kenya has taken its initiative to advocate Special Needs Education in the National Special Needs Education Policy 2009, for the children with special needs who have learning difficulty or disability that hinder them from making use of educational facilities provided in schools. Besides, Kenya's 2010 constitution endorses education for all children including those with autism without any discrimination. A good number of Kenya's public and private universities offer courses in special needs education at undergraduate and postgraduate levels. Despite these efforts the major concern is that classroom practices as currently established could be set to only support the non-disabled learners, and teachers may be reluctant to modify instructions in ways that extend to learners who differ in their way of learning such as those with autism spectrum disorder (Cohen, 2012).

2. Theoretical Framework and Literature Review

The study was informed by the Reinforcement theory by BF Skinner. Positive reinforcement is any type encouragement that follows a desired behavior, and is implemented to emphasize the positivity of the action. Positive reinforcement can either be a reward for good behavior, or simply positive communication in the form of praise or encouragement (McCarthy, 2010). Reinforcement is designed to increase the probability that a desired behavior will occur with the delivery of an item immediately after the behavior is exhibited. Previous studies exist on various forms of classroom supports systems and learning outcomes among learners. On the effectiveness of instructional supports, Lancion et al., (2007) found that learners trained in the use of the device demonstrated successful learning outcomes and basic communication. Another study by Charlop-Christy et al., (2002) demonstrated an inverse relationship between communication skills and problem behaviours. Mirenda, (2011) study also reported that learners develop increased spoken language skills after instruction in the skills. Some benefits of using augmentative and alternative communication included social and academic leadership skill development, becoming a more effective teacher, reduction in challenging behaviours and parents' new social networks (Finkel, et al., 2009). Trela and Jimenes (2007) also found that instruction based on task analysis of component skills was an effective strategy for increasing learner response rate and accuracy.

In a study on effectiveness of environmental supports, Kili and Gunga, (2014) found that the educational success of a learner with autism depends on the environment and teaching methods. Mwangi, (2013) also provides further evidence that teachers could be struggling to create learning opportunities for learners with autism in the classroom environment. However, Oren and Fisher (2007), visual supports and other discrete evidence-based intervention techniques fail to constitute effective classroom environment practices. Robertson and Simpson (2003) findings highlight a connection between the teacher and learner with autism relationship and the quality of the instruction in the classroom environment. Similarly, Ghasemtabar (2015) showed that Music therapy is an effective method with deep and consistent effects on improving social skills of learners with autism. Studies on effectiveness of social supports have been reported. Allen et al., (2009) found that learners with ASD reported benefiting from music in many ways, including helping to change their mood, reducing feelings of depression, having a therapeutic healing effect and provide feelings of belonging and social connectedness thus contributing to positive learning outcomes in the classroom. Koegel et al., (2011) found that developing social skills games and activities based on the preservative interests of learners with ASD were also useful in improving the social skills of learners with ASD. In a systematic literature review, Flynn and Healy (2012) reported that the efficacy of the peer-mediated intervention method is largely attributed to its naturalistic character. Nikopoulus and Keenan, (2007) found that video modeling reduced response latency in social situations and facilitate imitation of social behavior, reciprocal interaction and social initiation in learners with ASDs. Reichow and Volkmar (2010) conclude that enough evidence exists to support the use of peer training methods in enhancing the social skills of all individuals with ASD.

Effectiveness of Individualized Education Program is associated with lower language, literacy, and mathematics scores among all learners (Kyunghee & Rispoli, 2016). Ruble et al., (2010) reported no statistically significant association between demographics and IEP quality, and IEPs contained relatively clear descriptions of present levels of performance. Musolff, (2016) study emphasized that the use of

evaluation and assessments as an indicator of quality programming for learners with autism is directly linked to the outcomes included in the IEP. Similarly, Ruble et al., (2010), reported that, after consultation, targeted IEP quality scores were higher in the intervention group compared to the non-intervention group. The findings study supported the idea of parent-teacher consultation in ensuring IEP quality for learners with autism. From the reviewed studies, the, existing research studies have most frequently focused on inclusion of learners with autism in general education setting, particularly in developed countries. Much remain to be learned about the effectiveness and social validity of various methods for teaching diverse learners with autism spectrum disorders. However unbiased assessment of current educational treatment in special schools was the necessary first step in devising a plan for a long-term systematic educational change for the learners. The present study investigated classroom learning Supports systems and learning outcomes among learners with autism spectrum disorders in Kenya.

3. The Present Study

The present study investigated classroom supports systems and learning outcomes among learners with autism spectrum disorders in Kenya.

4. Research Hypothesis

The following research hypothesis was tested:

Ho: There is no significant relationship between classrooms supports systems and learning outcomes among learners with autism spectrum disorders in Kenya.

5. Methods

5.1 Research design

The correlational research design was adopted in this study. Correlational designs involve the systematic investigation of the nature of relationships, or associations between and among variables, rather than direct cause-effect relationships. Correlational designs are typically cross-sectional (Burns & Grove, 2005; Walker, 2005). This design is used to examine if changes in one or more variable are related to changes in another variable(s). More specifically, the Predictive Correlational Design was used to help predict the variance of one or more variables based on the variance of another variable. Thus, the design was relevant in the present study as it helped to assess teachers' perspectives on how the selected classroom learning supports systems predict the overall learning outcomes among learners with autism.

5.2 Participants

The accessible population of the study comprised 360 classroom teachers from 30 special primary schools in the North Rift and Western regions of Kenya. A sample size of 200 teachers was obtained from the study population using proportionate sampling technique. The sample size was determined from the 30% of accessible population criteria as recommended by Gall and Borg (2003), that in educational research, at least 30% of the total population is well representative for any study.

5.3 Measures

A questionnaire was used to collect information from the teachers on their knowledge and experience on autism and autism classroom instruction and supports. Questionnaire to teachers was used to gather data on utilization of classroom learning Supports systems. The use of instructional supports sub-scale had 15 items, the environmental supports sub-scale had 12 items, the use of IEP sub-scale had 12 items and social supports sub-scale had 12 items. All the sub-scales had a response format of a 5-point Likert scale, (1) Not important, (2) Least important, (3), Somewhat important, (4) Important and (5) Very important.   The Learning Outcomes Assessment scale had 12 items on a 5-point Likert scale, (1) Not at all, (2) Least often, (3) Less often, (4) Often, and (5) Very often. A panel of experts in Special Needs Education and Psychology in one public university in Kenya were used to evaluate the content validity of the questionnaires. The reliability of questionnaires was ascertained by the use of Cronbach's alpha method and the results are presented in Table 1.

Table 1: Cronbach's Alpha results for the questionnaire

Scale	No. Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
Instructional supports (use)	16	.894	.898
Instructional supports (importance)	16	.885	.890
Environmental supports(use)	11	.899	.903
Environmental supports (Importance)	11	.937	.937
Social skill supports (use)	9	.785	.787
Social skill supports (importance)	9	.726	.732
IEP (use)	8	.887	.893
IEP (importance)	8	.880	.889
Learning outcomes (Cognitive)	5	.658	.627
Learning outcomes (Behaviour)	7	.848	.846
Learning outcomes (Emotional/Social)	7	.855	.856

The internal consistency results indicate that all the subscales had Cronbach's alpha of greater 0.60, which according to Griethuijsen, (2018) is adequate. These findings show that the questionnaires were generally suitable for data collection; because they adequately measured the constructs for which they were intended to measure.

5.4 Procedure

The ethical clearance for the study was first obtained from National Commission for Science, Technology and Innovation in Kenya (Ethical clearance number-NACOSTI/P/17/36995/18586). Thereafter, permission to conduct the study in the selected special primary schools was obtained from the head teachers of the respective targeted special schools. The researcher pre-visited the targeted schools to schedule an appropriate date and time for the actual data collection. On the scheduled date, the researcher visited the schools and explained the purpose of the study to the teachers and sought their consent to participate in the research. Upon acceptance and signing of the consent forms, the researcher gave the

teachers the questionnaires to fill. It took about 30 minutes for the questionnaires to be completed after which they were collected by the researcher.

5.5 Data Analysis

The quantitative data from questionnaires collected underwent data processing procedures which included; data cleaning, data editing, data coding and entry in a computer for analysis. The Statistical Package for Social Sciences (SPSS) Version 22 was used in the analysis. Inferential statistics, the Pearson Correlation Coefficient was to assess the relationship between the study variables, was used. In addition, linear and multiple regression analyses were used to analyze data. Linear regression is a statistical test applied to a data set to define and quantify the relation between the considered variables (Kumari & Yadav, 2018) while multiple regression employs a linear Junction of two or more independent variables to explain the variation in a dependent variable (Allen, 1997).

6. Results

6.1 Teachers Respondents Demographics

The study sought to investigate the teacher respondents' demographic characteristics such as; gender, age, their academic and professional qualifications and the length of time they had taught in their current school. The results are presented in Table 2:

Table 1: Teacher Respondents' Bio-Data (n=138)

Gender			
Item	F	(%)	Cumulative %
Male	53	38.4	38.4
Female	85	61.6	61.6
Total	138	100.0	100.0
Age in Years			
Item	F	(%)	Cumulative %
Below 25	3	2.2	2.2
25-31	3	2.2	4.4
32-38	33	23.9	28.3
39-45	38	27.5	55.8
Above 45	61	44.2	100.0
Total	138	100.0	

From Table 2 it is evident that a majority of 85 translating to 61.6% of the teachers who took part in the study were females and only 38.4% of them were males. Although the majority of the teacher respondents were females, it is clear that both gender was represented in the study, an indication that there was no bias in capturing the views of the teachers in regard to their gender. This means that the results of this study can easily be generalized information from the teachers on their knowledge and experience on autism and autism classroom instruction and supports. On their ages, the findings of the study established that most the teachers who teach learners with autism spectrum disorders in selected special school settings in the

North Rift and Western regions of Kenya, were aged above 39 years. This was reflected by 99 (71.7%) of the teachers who were sampled for the survey.

6.2 Correlation Analysis of Selected Classroom Supports Systems and Overall Learning Outcomes

To investigate whether there was any statistical significant influence of selected classroom supports systems on the learning outcomes among learners with autism spectrum disorders (ASDs), a Pearson Product Moment Correlation Coefficient was computed, with overall scores on selected Classroom Learning Supports systems as independent variables and learning outcomes among the learners with ASDs as dependent variable. The scores of the variables were computed from frequency of responses and converted into continuous scaled data by computing mean responses per respondents, where high scale ratings implied high perceived use of selected Classroom Learning Supports systems on utilization of Classroom Learning Supports systems or high perceived overall learning outcomes. Table 3 shows the correlation analysis results in SPSS output.

Table 3: Correlation results of selected Classroom Learning Supports systems and overall learning outcomes

Selected Classroom learning Supports systems		Overall Learning Outcome
Use of Instructional Support	Pearson Correlation	0.206^{**}
	Sig. (2-tailed)	.015
	N	138
Use of Environmental Supports	Pearson Correlation	0.411^{**}
	Sig. (2-tailed)	.000
	N	138
use of social skills supports	Pearson Correlation	0.254^{**}
	Sig. (2-tailed)	.003
	N	138
use of Individualized Educational Program	Pearson Correlation	0.492^{**}
	Sig. (2-tailed)	.000
	N	138

From Table 3, the findings show that there was a significant, though weak, positive correlation (r=.206, n=138, p=.015) between use of instructional supports and overall learning outcomes. There was statistically significant, but weak positive correlation (r=.411, n=138, p<.05) between use of environmental supports and overall learning output; there was statistically significant, though weak positive correlation (r=.254, n=138, p=.003) between use of social skills supports and overall learning outcome of learners with ASDs. There is a statistically significant moderate positive correlation (r=.492, n=138, p=.000) between use of Individualized Educational Program (IEP) supports and overall learning outcomes. It was therefore concluded that implementation of use of selected classroom learning Supports systems has positive influence on teaching and learning outcomes among the learners with ASDs.

6.3 Linear Regression Analysis of Relationship Between Selected Classroom Supports Systems and Learning Outcomes

To estimate the level of influence of selected Classroom Supports systems on overall learning outcomes, a coefficient of determination was computed. This was done using regression analysis and the results were as shown in Table 4.

Table 4: Model Summary on Linear Regression Analysis of relationship between selected Classroom Learning Supports systems and learning outcomes

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Instructional supports	.206[a]	.043	.035	.78667
Environmental supports	.411[a]	.169	.163	.73288
Social skills supports	.254[a]	.065	.058	.77755
Individualized Educational Program (IEP) supports	.492[a]	.242	.237	.69977
Predictors: Use of instructional supports, Use of environmental supports, use of social skills supports, use of Individualized Educational Program (IEP) supports				

In Table 4, the findings of Linear regression analysis model show that use of instructional supports accounted for 4.3% as signified by coefficient $R2= .043$ of the variation in learning outcomes among learners with ASDs. From the model summary, use of environmental supports accounted for 16.9% ($R2= .169$) of the variation in learning outcomes among learners with ASDs. In addition, the use of social skills supports accounted for 6.5% ($R2= .065$) of the variation in learning outcomes among learners with ASDs while the use of Individualized Educational Program (IEP) supports accounted for 24.3% as signified by coefficient $R2= .242$ of the variation in learning outcomes among learners with ASDs.

6.4 Multiple Regression Analysis

The study sought to establish a linear model that could be used to describe the optimal level of overall learning outcomes among learners with autism spectrum disorders given the selected classroom learning Supports systems. This was done by use of standard multiple regression analysis, where the four independent variables (use of instructional, environmental, social skills and IEP supports) were included in the model at once. Use of a multiple-regression was necessary because it helped to investigate how well the set of the independent variables was able to predict the learning outcomes. In addition, the analysis provided information about the relative contribution of each of the variables that make up the model. Each independent variable was evaluated in terms of its predictive power, over and above that offered by all the other independent variables. Further, it made it possible to know how much unique variance, in the dependent variable, each of the independent variables explained. Relevant preliminary analyses were performed to ensure no violation of the appropriate assumptions of multiple-regression. Table 5 shows the regression analysis model summary output.

Table 5: Regression Analysis Model summary output –learning outcomes

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.596[a]	.356	.336	.65263	1.588
a. Predictors: (Constant), IEP Development and Implementation , Engagement in Social Interaction, Use of Instructional Support, Use of Environmental Support					
b. Dependent Variable: Overall Learning Outcome					

First, the Durbin-Watson test (shown in Table 5) was used to check if the assumptions of regression that the observations are independent were met. The Durbin-Watson statistics was 1.588 which is between 1.5 and 2.5, implying that the data was not auto-correlated; meaning assumption of independence was not violated (Creswell, 2014).

Secondly, in the model summary the "R" column represents the value of R, the multiple correlation coefficients. It is a measure of the quality of the prediction of the dependent variable, learning outcomes. The value of .596 indicates a good level of prediction. However, the value of R-Square (.356) indicates how much of the variance in the dependent variable (learning outcomes) was explained by the model. This value expressed as a percentage means that the model explains 35.6 percent of the variance in learning outcomes among learners with ASDs. This is the proportion of variance in the learning outcomes that is explained by the independent variables; it is the proportion of variation accounted for by the regression model above and beyond the mean model.

6.5 Evaluating Contribution of each of the Independent Variables

The study sought to investigate the level of contribution of the individual independent variables included in the model in the prediction of the level of learning outcomes among the learners with ASDs. This was shown by coefficients values in Table 6. Scrutiny of the coefficients values reveals that each independent variable contributes differently to the model.

Table 6: Coefficient output: learning outcomes among learners with ASDs

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.627	.546		2.982	.003		
	Use of Instructional Supports	.008	.093	.006	.082	.935	.855	1.170
	Use of Environmental Supports	.517	.133	.294	3.885	.000	.847	1.181
	Engagement in Social Interaction	.224	.091	.176	2.473	.015	.959	1.042
	IEP Development and Imp.	.600	.113	.389	5.290	.000	.898	1.114
a. Dependent Variable: Overall Learning Outcome								

First, the study assessed the multi-collinearity issues by examining tolerance and the Variance Inflation Factor (VIF) which are some two collinearity diagnostic factors, shown in the last column in Table 6. Tolerance is an indication of the percentage of variance in the predictor that cannot be accounted for by the other predictors. Hence, very small values indicate that a predictor is redundant, and values that are less than .10 may merit further investigation, and a variable whose VIF values is greater than 10 may merit further investigation. The variable's tolerance is $1-R^2$, while VIF is its reciprocal. A small tolerance value indicates that the variable under consideration is almost a perfect linear combination of the independent variables already in the equation and that it should not be added to the regression equation. It is evident that the collinearity conditions were met, given that each of the variables had adequate tolerance (tolerance value > .10) and Variance Inflation Factor (VIF <10). These findings indicate that there was no violation of multi-collinearity assumptions which is a requirement for multiple regression analysis, which the study used.

Secondly, from the Table 6, it is evident use of IEP had the highest influence (Beta=.389) on learning outcomes, while use of instructional supports made the least contribution (Beta=.006) to explain the variability of the model. This finding means that a one standard deviation positive improvement in use of IEP factors leads to a .389 standard deviation improvement in predicted learning outcomes, with the other variables held constant. The beta value (.006) for the use of instructional supports indicate that a one standard deviation increase in use of instructional supports would only lead to a .006 standard deviation improvement in learning outcomes among the learners with ASDs, when the other variables in the model remains constant.

6.6 The Regression Model

A regression model for the relationship between these independent variables and dependent variables was represented by: Y = o + 1 x1 + 2 x 2 + 3 x 3 + 4 x 4ε.

Where: Y is learning outcome among learners with ASDs

X1   Use of Instructional Supports

X2   Use of Environmental Supports

X3   Engagements in Social Interaction

X4   Use of IEP Development and Implementation

Optimum level of learning outcomes was presented by:

 +.008x1 + x2 + x3+ x4+ error term

From the equation, the coefficients indicate how much learning outcome varies with an independent variable when all other independent variables are held constant. For example, the unstandardized coefficient, X2, use of environmental supports is equal to .517 means that for each one-unit increase in use of environmental supports, there is an improvement in learning outcome among the learners with ASDs of.517 units. Similarly, for each one-unit increase in use of IEP Development and Implementation, there is an improvement in learning outcomes among the ASDs learners of.600 units. All the coefficients of the variables were statistically significantly different to 0 (zero), $p<.05$, except for the use of Instructional Support with $p=.935$ (ns). Therefore, it is concluded that the model was adequate to predict learning outcomes among the learners with ASDs in special school settings in Kenya. It was statistically significant [$F_{(3, 133)} =18.35$, $R^2=.356$, sig. $<.05$]. More than a third, 35.6%, of the variability learning outcomes among the learners with ASDs is explained by the independent variables factored in the model, with quite plausible results.

7. Discussion

The study examined classroom supports systems and learning outcomes among learners with autism spectrum disorders in Kenya. The findings indicated that the coefficients of three variables (Use of Environmental Supports, Engagements in Social Interaction and Use of Individualized Education Program and Implementation) were statistically significantly different to 0 (zero), $p<.05$, except for the use of Instructional Support with $p=.935$ (ns). From the Regression model output, the value of R square obtained 0.356 expressed as a percentage means that the model explains 35.6 percent of the variance in learning outcomes among learners with ASDs. This is the proportion of variance in the learning outcomes that is explained by the classroom supports systems. The results from the Coefficient Output indicate that Individualized Education Program had the highest influence (Beta=.389) on learning outcomes, while use of instructional supports made the least contribution (Beta=.006) to explain the variability of the model. This finding agrees with Trela and Jimenes (2007) which found that instruction based on task analysis of component skills was an effective strategy for increasing learner response rate and accuracy. In addition,

Kili and Gunga, (2014) found that the educational success of a learner with autism depends on the environment and teaching methods.

Similarly, Oren and Fisher (2007) also recommend the use of visual supports within a comprehensive model of intervention based in the tenets of applied behaviour analysis. Robertson and Simpson (2003) findings highlight a connection between the teacher and learner with autism relationship and the quality of the instruction in the classroom environment. In agreement, Ghasemtabar et al., (2015) showed that music therapy is an effective method with deep and consistent effects on improving social skills of learners with autism. Allen, et al., (2009) also found that those with ASD reported benefiting from music in many ways, including helping to change their mood, reducing feelings of depression, having a therapeutic healing effect and provide feelings of belonging and social connectedness thus contributing to positive learning outcomes in the classroom. Koegel et al., (2011) and Flynn and Healy (2012) all agree that developing social skills games and activities based on the preservative interests of learners with ASD were also useful in improving the social skills of learners with ASD. Nikopoulus and Keenan, (2007); Reichow and Volkmar (2010) conclude that enough evidence exists to support the use of peer training methods in enhancing the social skills of all individuals with ASD. Studies by Musolff, (2016) and Ruble, et al., (2010) all conclude that study indicated that the use of evaluation and assessments as an indicator of quality programming for learners with autism is directly linked to the outcomes included in the IEP. However, the findings are contrary to that of Ruble, McGrew, Dalrymple, and Jung, (2010) which identified no statistically significant association IEP quality and levels of learning outcomes among learners. Similarly, Kyunghee and Rispoli (2016) study indicated that Individualized Education Program receipt was associated with lower language, literacy, and mathematics scores among all learners. In addition, Charlop-Christy, et al., (2002) study also reported inverse relationship between communication skills and problem behaviours.

8. Conclusion

The study concludes that the use of social supports for learners with Autism spectrum disorder enhances their learning outcomes in schools. The implication of this finding is that there is need for teachers to improve the social supports, psychological and emotional support and enhance the use of Individualized Education Program for learners with ASD in schools. The study recommends that the Kenyan Ministry of Education should employ and post speech and language therapists to schools for learners with autism to help them improve and overcome the communication difficulties they face. In addition, school principals should ensure that there is more collaboration between parents, teachers and other stakeholders to provide effective learning environment for learners with autism as well as psychological and emotional support for them. Finally, it is recommended that teachers should adopt more peer mediated skills to assist learners with autism to promote sharing and helping each other in classroom activities. Future studies could investigate the effectiveness of inclusion of learners with autism in regular education setting.

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