

## **Influence of Instructional Supports on Learning Outcomes among Learners with Autism Spectrum Disorders**

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**Abstract:** *The present study investigated the Influence of Instructional Supports on Learning Outcomes among Learners with Autism Spectrum Disorders. The study population comprised 420 teachers and 30 head teachers, 30 deputy head teachers and 360 teachers in the 30 selected special schools in the North Rift and Western regions of Kenya. The study used convergent parallel mixed methods design. The sample size for this study comprised 200 teachers from 25 schools. Simple random and purposive sampling was used to sample the participants. Data was collected through a survey comprising self-administered questionnaires; in-depth interviews, and classroom observations. Face and construct validity was ensured using expert judgment by university supervisors while reliability was ensured by split-half method and an  $r=0.858$  was reported. Quantitative data was analyzed using descriptive statistics and also inferential statistics such as Pearson Correlation and Regression analysis. Qualitative data on the other hand was analyzed by using thematic framework. Reliability was determined by internal consistency and a reliability coefficient of  $r=0.752$  was reported. The finding of the study reported that there was statistically significant, though weak, positive correlation ( $r=.206, n=138, p=.015$ ) between use of instructional supports and overall learning outcomes. The study recommended that teachers should adopt more peer mediated skills to assist learners with autism to promote sharing and help each other in classroom activities.*

**Key words:** *Instructional Supports; Learning Outcomes; Autism Spectrum Disorders; Special School; Kenya*

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### **I. Introduction**

As early as the 1760s educationists had developed the idea that there should be a free system of education that would provide for general diffusion of knowledge, cultivate new learning and nurture the democratic ideals of government (Alexander & Alexander, 2010). Education for all therefore is not a new concept. Little (2006) views education as a natural right that should include everyone. Adaptations made on the curriculum to meet the needs of learners with disabilities including autism address the human rights of the learners. Schools should therefore provide curricular opportunities to suit learners with different abilities and interest (Friend & Bursuck, 2012). The guiding principle, it can be argued, should be to provide all learners with the same education, assistance and support to those requiring it. Autism spectrum disorders also referred to as Pervasive Developmental Disorders (PDDs), currently encompass several disorders, most notably autistic disorders, Aspergers Syndrome and Pervasive Developmental Disorders-Not Otherwise Specified. Autism spectrum disorders are characterized by deficits in verbal and nonverbal communication, social interaction, and repetitive or restricted interest and behaviours (National Institute of Mental Health, 2008). Indeed challenges associated with social interactions and social relationships have been recognized as the defining features of ASD as one of the core deficits of learners with ASD. Successful social, emotional and cognitive development in learners with ASD can be impeded by social skills deficits. Furthermore research has shown that social skills impairments contribute to poor academic and occupational achievement. It is therefore important to consider social skills supports among the classroom supports for learners with autism.

Internationally, figures suggest that ASD is recognized as a major problem (Gerlai & Gerlai, 2003) demanding further research and informed interventions. In Scotland a policy focus on inclusive education has served to heighten awareness of ASD across the education profession, making it an issue of central concern in relation to education provision to learners with autism. Gerlai & Gerlai (2003) reiterate that recent work has extended knowledge of the impact of autism upon interpersonal, communicative, cognitive, imaginative,

sensory, perceptual, physiological and behavioural processes. This offers new perspective in examining the significance that needs to be attached to education of learners with autism. In England, it is estimated that there are approximately 1 in 100 people in the population who are diagnosed with ASD (Brugha, 2011). In Australia, data provided by the Australian Bureau of Statistics show that in 2012, there were 115,000 Australians living with ASD (Australian Bureau of Statistics, 2014) and that almost 81,200 were school aged learners (5-19 years). Of these learners 95% are reported to need specialized education to support their communication, social or learning difficulties (Australian Bureau of Statistics). The growing number of learners with autism globally reflects the need to focus attention on the education of learners with autism spectrum disorders in order to mitigate the negative impact of the disorder. A growing interest in the gap between research and ASD classroom practice has become a key topic of discussion (Costley, Chase, & Bruck, 2014). This gap has been attributed to the lack of readily available evidence based research about genuine classroom interventions and ASD school curricula (Clark, 2012). This lack of readily available accurate information circulating in the public arena could deny learners with autism spectrum disorders appropriate educational opportunities.

The effectiveness of instructional program may be determined in a consistent, unbiased manner through analysis of research based practices (Sandford, 2009). This includes comprehensive communication and intervention (Friend, 2012). This typically involves assessment by a speech and language pathologist as well as informal observation and classroom based evaluation. Friend, (2012) argued that instruction should emphasize paying attention, imitating, comprehending, and using language in play and social interaction. Iovannone, Dunlap, Huber, & Kincaid (2013) identified definitive areas of agreement as the effective practices for the education of learners with autism. These include the need for supportive and structured learning environment, early intervention, family involvement and specialized curricular with a deliberate focus on communication and social interaction skills. A core component of autism, restricted and repetitive patterns of interest, lends itself to a dependence on strict routines and order, the absence of which can lead to poor learning outcomes and challenging behaviours. Doo H. Lim and Michael Lane Morris (2016) study reported that the learners' perceived learning, learning motivation explained about 37% of the total variation. Likewise, learning motivation also explained about 28% of the total variation for the learners' perceived learning application. From this analysis, it was identified that instructor quality, learning motivation, and learning involvement were those influential variables predicting some dependent variables in course outcomes. Wambui, (2012) study found that instructional materials are not effectively used in the study area due to large numbers of learners per class, lack of enough compound in ECE centers, lack of learners' confidence, language barrier, teachers' negative attitude, lack of professional skills and domestic violence. Wang'ang'a (2014) study revealed that majority of the teachers teaching learners with deaf blindness used the following instructional methods; tactile Kenyan sign language, task analysis, Tadoma, sign language among others. Majority of teachers teaching learners with autistic blind used the following instructional methods; Braille, pre-Braille activities, oral methods among others. Majority of teachers teaching learners with cerebral palsy and intellectual disability used the following instructional methods; use of task analysis, activities of daily living, and real objects among others. Ruble, Usher and McGrew (2011) found that teachers who reported more confidence in classroom management (self-efficacy) also reported less burnout ( $p < .01$ , positive correlation between personal accomplishment, .43, emotional exhaustion, -.44 and depersonalization, -.38 and self-efficacy). Halabi, (2015) revealed that technology in general and tablet devices in particular are used in the classroom as reward mechanisms and entertaining strategies to seize and retain the learners' attention in order to achieve instructional goals.

The education of learners with ASD in Kenya usually goes together with those of learners with intellectual disability (Kili ad Gunga, 2014). This happens in spite of the fact that some individuals with ASD may not be having intellectual disability. Learners with ASDs receive their education alongside those with intellectual disability in special units found in regular primary schools such as City Primary school in Nairobi County, Homa Bay Primary school in Homa Bay County, and others spread all over the country, Kili & Gunga 2014. There are also special schools that solely admit learners with intellectual disability like Jacaranda Special School in Nairobi County, Kaimosi Special School in Vihiga County and Kipkelion Special School in Kericho County. In these schools for learners with intellectual disability, learners with ASDs are usually integrated or provided with special classrooms to support their education (Cohen, 2012). Some researchers like (Matasio, 2011) have questioned the extent to which the autism classroom supports being used in special schools include structured learning environment, visual supports, access to the curriculum, behavior intervention plans, curriculum designed to address core deficits, educational professional supports and positive school supports. North Rift and Western regions of Kenya have the highest number of schools for learners with intellectual disability which also serve learners with autism spectrum disorders. To date there has been little, if any, research studies that focus on the influence of classroom supports for learners with autism spectrum disorders.

## II. Research Methodology

The study used convergent parallel mixed methods design. The study population comprised 420 teachers and 30 head teachers, 30 deputy head teachers and 360 teachers in the 30 selected special schools in the North Rift and Western regions of Kenya. The sample size for this study comprised 200 teachers from 25 schools. Simple random and purposive sampling was used to sample the participants. Data was collected through a survey comprising self-administered questionnaires; in-depth interviews, and classroom observations. Face and construct validity was ensured using expert judgment by university supervisors while reliability was ensured by split-half method and an  $r=0.858$  was reported. Quantitative data was analyzed using descriptive statistics and also inferential statistics such as Pearson Correlation and Regression analysis. Qualitative data on the other hand was analyzed by using thematic framework. Reliability was determined by internal consistency and a reliability coefficient of  $r=0.752$  was reported.

## III. Findings & Discussions

This study investigated the influence of instructional supports on the learning outcomes among learners with autism spectrum disorders. It was done by exploring the views of respondents, on how often the instructional supports were used in the teaching of the learners with ASDs and the level of importance of the instructional supports in enhancing learning outcomes among the learners with ASDs. The teachers' views were presented in percentage frequencies as shown in Table 1.

**Table 1: Teachers Views on the Use of Instructional Supports**

Instructional supports	1	2	3	4	5	Mean	SD
Low Learner : Teacher ratio	2 (1.4%)	34 (24.6%)	31 (22.5%)	49 (35.5%)	22 (15.9%)	3.40	1.07
Ongoing formative assessment	7 (5.1%)	10 (7.2%)	34 (24.6%)	60 (43.5%)	27 (19.6%)	3.69	1.02
Functional Behavior Assessments	0 (0.0%)	12 (8.7%)	19 (13.8%)	55 (39.9%)	52 (37.7%)	4.07	0.93
Visual Support (schedules, room Organization, etc	0 (0.0%)	13 (9.4%)	44 (31.9%)	49 (35.5%)	32 (23.2%)	3.72	0.92
Augmentative and Alternative Communication (AAC)	11 (8.0%)	23 (16.7%)	38 (27.5%)	34 (24.6%)	32 (23.2%)	3.38	1.23
Structured Learning Environment	0 (0.0%)	18 (13.0%)	33 (23.9%)	50 (36.2%)	37 (26.8%)	3.77	0.99
Behaviour Intervention Plan	0 (0.0%)	19 (13.8%)	35 (25.4%)	42 (30.4%)	42 (30.4%)	3.78	1.03
Positive behavior support (school wide, group or individual)	0 (0.0%)	0 (0.0%)	42 (30.4%)	51 (37.0%)	45 (32.6%)	4.02	0.79
Curriculum designed to address core deficits	2 (1.4%)	19 (13.8%)	29 (21.0%)	41 (29.7%)	47 (34.1%)	3.81	1.09
Systematic targeted instruction	2 (1.4%)	16 (11.6%)	51 (37.0%)	30 (21.7%)	39 (28.3%)	3.64	1.06
Applied behavior analysis	0 (0.0%)	13 (9.4%)	53 (38.4%)	49 (35.5%)	23 (16.7%)	3.59	0.87
Discrete trial teaching	5 (3.6%)	29 (21.0%)	49 (35.5%)	34 (24.6%)	21 (15.2%)	3.27	1.07
Re-enforcement systems (contingency-based system)	2 (1.4%)	17 (12.3%)	21 (15.2%)	49 (35.5%)	49 (35.5%)	3.91	1.06
Picture Exchange Communication Systems	4 (2.9%)	19 (13.8%)	54 (39.1%)	44 (31.9%)	17 (12.3%)	3.37	0.96
Voice output devices	38 (27.5%)	31 (22.5%)	35 (25.4%)	20 (14.5%)	14 (10.1%)	2.57	1.30
Sign language	19 (13.8%)	41 (29.7%)	43 (31.2%)	18 (13.0%)	17 (12.3%)	2.80	1.20
Average score of use of instructional support						3.55	0.65

Key: 1-Hardly ever, 2-Sometimes, 3-Occasionally, 4-Frequently, 5-Always and SD-Standard deviation.

Source: Survey data (2017)

The findings of the study established that generally the teachers only used the instructional supports as expected in the teaching of learners with ASDs occasionally. This was confirmed by the overall mean rating score of 3.55 (SD = 0.65) on the use of instructional supports. However, it emerged that some instructional supports were more frequently used in classroom than others. For instance, a functional behavior assessment as an instructional support was most frequently used at mean of 4.07 with standard deviation of 0.93. In fact, 55 (39.9%) and 52 (37.7%) of the teachers who took part in the survey indicated that they frequently and always, respectively, used functional behavior assessment as an instructional support during teaching of the learners with ASDs. On the same note, the study established that use of positive behavior supports (school wide, group

or individual) at mean of 4.02 (SD=0.79) and re-enforcement systems (contingency-based system) at a mean of 3.91 (SD=1.06) were also frequently used as instructional supports in the teaching of learners with ASDs. This finding agrees with Friend, (2012) who argued that instruction should emphasize paying attention, imitating, comprehending, and using language in play and social interaction.

Most participants also reported that the use of instructional supports in classroom enhances communication outcomes among learners with ASD. This means that the instructional supports have made learners to become adept in their use of the spoken word in interpersonal communication, small group interactions and public speaking. For example, some participants reported that:

The use of instructional supports have made the learners with ASD to become more fluent in understanding simple and clear directions in very short sentences. (HT 11)

Use of communication is enhanced because the learners with ASD are made to often repeat words and phrases used by the teacher. (HT 16)

From the excerpts above, it can be explained that the use of instructional supports has enhanced communication among learners with ASD. In addition, the use of instructional supports has ensured that it encourages learners' analytical and creative skills in order that they will be prepared to address a wide variety of challenges in their community and professional lives. This has further ensured that learners become adept in their use of the written word for informational, persuasive and creative purposes. Similarly, Iovannone, Dunlap, Huber, & Kincaid (2013) revealed that a core component of autism, restricted and repetitive patterns of interest, lends itself to a dependence on strict routines and order, the absence of which can lead to poor learning outcomes and challenging behaviours. Most participants reported that there were several instructional supports that influence the learning outcomes among learners with Autism Spectrum Disorder (ASD). Some instructional supports used in schools included real objects, assorted teaching aids, audio support, audio-visual, pictorial support, use of bulletin board and book. The participants reported that the instructional supports greatly influenced the learning outcomes in several ways.

First, the instructional supports enhanced the attention span among the learners with ASD. The attention span is the length of time during which one (such as an individual or a group) is able to concentrate or remain interested in an activity. Most participants reported that the learners with ASD were able to concentrate much longer in class because of the effects of the instructional supports that were available. For example, some participants reported that:

The attention span of the learners is greatly enhanced when there are instructional supports available to them in school. We have seen this happen here in our school and it makes a big difference, thus very important for learning to take place. (HT 17)

Well, the use of instructional supports has been very helpful to our learners with ASD in school. They are able to absorb more content for much longer periods than if there were none available in school. Our learners are able to stay focused in classroom lessons for longer periods of time when we use the instructional supports. (HT 15)

From the excerpts above, it safe to state that instructional supports in school have made learners with ASD to have improved attention span in class. This means that the supports enhance their capacity to absorb more classroom content for longer periods. This finding corroborates that of Doo H. Lim and Michael Lane Morris (2016) who agreed that the learners' mean score of satisfaction with the online course was significantly related with their mean scores in instructor quality and learning activity. In addition, the learners' perceived learning mean score was significantly related with the mean scores in learners' learning motivation and involvement. Similarly, the learners' mean score of perceived learning application was significantly related with the mean scores of learning motivation and involvement. Similarly, 88 (63.8%) of the teachers who took part in the survey said that they occasionally used curriculum designed to address core deficits of the learners with ASDs. Use of Visual Supports, Structured Learning Environment and Behaviour Intervention Plan were established by the findings of this study to be occasional. Their usage rating were oscillating around 3.7, implying that they were only occasionally used as instructional supports during teaching of the learners with ASDs. This finding echoes Wambui's, (2012) who found that instructional materials are not effectively used in the study area due to large numbers of learners per class, lack of enough compound in ECE centers, lack of learners' confidence, language barrier, teachers' negative attitude, lack of professional skills and domestic violence.

It was also reported that the instructional supports enhanced social outcomes among learners with ASD in school. Some participants reported that the instructional supports helped learners to develop socially in school. This is because aspects such as play enhanced peer interaction among learners with ASD. For example, one participant reported that:

Instructional supports through play have been effective in enhancing friendship among learners in class. The learners with ASD are able to learn to live with others and make friends. (HT 18)

From the excerpt above, it can be revealed that the instructional supports have enhanced interaction levels among the learners with ASD. This finding agrees with Strong, (2014) who stated that the participants had strong beliefs in their abilities to effectively teach their learners with ASD. Following participation in the Post-Baccalaureate Certificate program, the survey respondents overwhelmingly confirmed their familiarity with the evidence-based practices, indicating a substantial and effective emphasis on the use of evidence-based practices within the curriculum. The results of the study indicate that many of the teachers who took part in the survey agreed that their usage of some of the instructional supports for the learners with ASDs were generally low. For example, 53 (38.4%), 49 (35.5%) and 54 (39.1%) of the teacher respondents were in agreement that they only occasionally used applied behavior analysis, discrete trial teaching and Picture Exchange Communication Systems in teaching learners with ASDs. This finding corroborates that of Ruble, Usher and McGrew (2011) who found that teachers who reported more confidence in classroom management (self-efficacy) also reported less burnout, positive correlation between personal accomplishment, .43, emotional exhaustion, -.44 and depersonalization, -.38 and self-efficacy).

Secondly, it was also reported that the instructional supports enhanced the rate of memory among learners with ASD. This means that the power or process of reproducing or recalling what has been learned and retained especially is through associative mechanisms. It also means the store of things learned and retained from an organism's activity or experience is evidenced by modification of structure or behavior or by recall and recognition. Most participants reported that the rate of memory among learners with ASD was enhanced with the use of classroom instructional supports. For example, some participants reported that:

We have seen the increased rate of memory among our learners with ASD when there are instructional supports available for them in school. Learners are able to remember many things that they are taught after being exposed to lots of instructional materials.(HT 20)

From our school experience, I have seen most learners are now able to memorize many facts taught in class due to the use of many instructional materials that we have. (HT 15)

It can be stated that instructional supports have enabled the learners with ASD to be able to have increased memory of the content that they are taught in class. This finding supports that of Halabi, (2015) who agreed that the learners' conceptual levels affect their response to the reward and influence their social behavioral skills that could become uncontrollable. Additionally, the findings raised awareness concerning the learners' reactions to the change in their daily structured schedule and revealed some practices to manage learners' behavior. On the contrary, the study findings established that some instructional supports were quite infrequently used by the learners. For example, use of voice output devices only attracted mean response of 2.57 (SD=1.30), Augmentative and Alternative Communication (AAC) instructional support was rated at a mean of 3.38 (SD=1.23) and systematic targeted instruction was rated at a mean of 3.34 (SD=1.06). On the same vein, 60 (43.5%) of the teachers who participated in the study confirmed that they hardly ever or in a few instances had used sign language as an instructional support in teaching the learners with ASDs. This finding agrees with Lancioni et al (2007) who reported that sign language once the most frequently used communication strategy for learners with ASD is no longer as popular as it once was. The findings also support assertions by Seanessy (2017) who reported that there is significant correlations between UDL training and the use of UDL strategies in the classroom overall as well as total number of UDL strategies used. Further correlations were found between Social-emotional learning in the classroom and use of UDL strategies as well as links between UDL training, UDL use, and the use of teaching tools that target visual modalities. Two out of three studies showed no gains in academic outcomes in quantitative data, but all studies showed positive learner perceptions in the qualitative data collected.

The study also reported that instructional supports enhanced the emotional outcomes among learners with ASD. This means how learners think and feel about themselves, get along with others, and regulate their attention and behavior. The emotional learning outcomes play an important role in learners' school and life outcomes. Some participants reported that:

The instructional supports have helped enhance the positive feeling among learners with ASD. The learners' self-esteem has improved and they now see themselves differently and do not look down upon themselves (HT 13)

Learners who have been taught with lots of instructional supports have been able to confidently grow into understanding adults and are able to understand themselves better. (HT 11)

The use of instructional supports have made learners with ASD to have reduced tantrums as they get used to working with each other even in groups tasks and assignments (HT 20)

From the interview excerpts above, it can be said that instructional supports have influenced the emotional outcomes among learners with ASD. This finding is counter to published research that showed no significant gains at the posttest compared to traditional curricular materials, suggesting that game enhancement does not improve topical knowledge in science for learners with disabilities over a fourteen-day period (Marino

et al 2014b). However, qualitative data showed UDL strategies were effective at providing learners with multiple means of representation and expression. Marino’s study focused generally on learners with disabilities.

To investigate whether there was any statistical significant influence of instructional supports on the learning outcomes among learners with autism spectrum disorders (ASDs), the null hypothesis was tested. To do this, a Pearson Product Moment Correlation Coefficient was computed, with overall scores on instructional supports as independent variable 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 respondent, where high scale ratings implied high perceived use of instructional supports on utilization of classroom supports or high perceived overall learning outputs and vice-versa. The p-value was set at .05, the null hypothesis was rejected when the p-value was less than .05 but it was accepted when the p-value obtained was greater than .05. Table 2 shows the correlation analysis results in SPSS output.

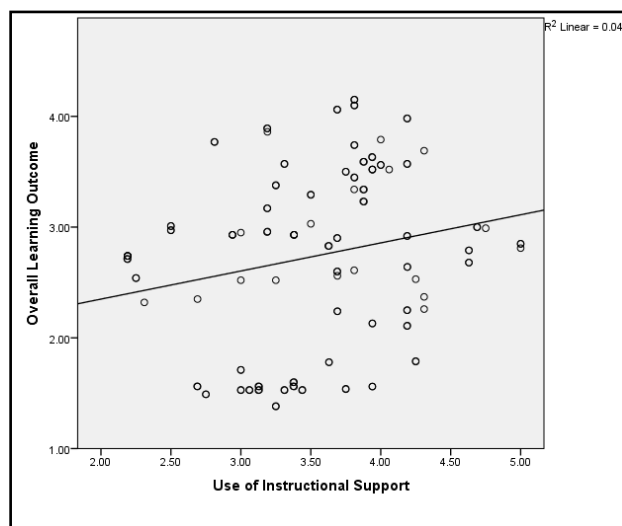
**Table 2: Use of Instructional Support and Overall Learning Outcome**

	Use of Instructional Support	Overall Learning Outcome
Use of Instructional Supports	Pearson Correlation	.206*
	Sig. (2-tailed)	.015
	N	138
Overall Learning Outcomes	Pearson Correlation	.206*
	Sig. (2-tailed)	.015
	N	138

\*. Correlation is significant at the 0.05 level (2-tailed).

The finding of the study shows that there was statistically significant, though weak, positive correlation ( $r=.206$ ,  $n=138$ ,  $p=.015$ ) between use of instructional supports and overall learning outcomes, with increase in use of instructional supports resulting in to increase overall learning outcomes and vice-versa. Given that the relationship was statistically significant, the null hypothesis which stated that, “*there is no significant influence of instructional supports on the learning outcomes among learners with autism spectrum disorders*” was rejected. It was therefore concluded that implementation of use of instructional supports has positive influence on teaching and learning outcomes among the learners with ASDs. This finding supports that of Courey at al. (2013) who reported that significant improvements in lesson plan writing with UDL after the training were found, as well as maintenance of lesson plan writing skills over time.

To further illustrate this relationship, a scatter plot was generated as shown in Figure 1.



**Figure 1: Influence of Instructional Supports on Learning Output**

The scatter plot indicates that there were some evidence of a positive correlation between instructional supports and overall learning outcomes. It is indicative that the pattern of dots seems to slope from lower left to upper right, a clue of a positive correlation between the two variables. The line of best fit (trend line) further reveals that there was correlation between the two variables. This is because the coordinate points cluster near the line of best fit and were scattered around it forming almost a visible pattern; implying that the two data sets were agreeing. The scatters tend to concentrate in the vicinity of the identity line, meaning the relationship was real and not by chance. This finding validates that of McGhie-Richmond & Sung (2012) who reported that,

teacher training in UDL effects lesson plan design and learning outcomes. To estimate the level of influence of instructional supports on overall learning outcomes, a coefficient of determination was computed. This was done using regression analysis and the results were as shown in Table 3.

**Table 3: Model Summary on Regression Analysis of Influence of Instructional Supports on Learning Outcomes**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.206 <sup>a</sup>	.043	.035	.78667

a. Predictors: (Constant), Use of Instructional Support

The model shows that use of instructional supports accounted for 4.3% as signified by coefficient  $R^2 = .043$  of the variation in learning outcomes among learners with ASDs. However, to determine whether use of instructional supports was a significant predictor of learning outcomes, Analysis of Variance (ANOVA) was computed as shown in Table 4.

**Table 4: ANOVA –Influence of Instructional Supports on learning outcomes**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.738	1	3.738	6.040	.015 <sup>b</sup>
	Residual	84.164	136	.619		
	Total	87.902	137			

a. Dependent Variable: Overall Learning Outcome

b. Predictors: (Constant), Use of Instructional Supports

From Table 4, it is evident that use of instructional supports in utilization of classrooms supports was a significant predictor of overall learning outcomes among the learners with ASDs [ $F(1, 136) = 6.04, p = .015$ ]. This further confirms that use of instructional supports significantly influence overall learning outcomes among the learners with ASDs. From the results it was clear that instructional supports explain a considerable amount of the variance in the level of overall learning outcomes. This finding is consistent with that of Lars and Morberg (2016) study who reported that the instructional strategies that early introduce concepts and views in generative topics make learning more efficient. Learners have shown that pivotal interventions are considered to be sufficiently efficient in enabling skills among learners with ASD to be more generalized. In addition, the study sought to establish the relationship between instructional supports and the individual aspects of learning outcomes (cognitive characteristics, behavioural characteristics, social/emotional characteristics and communication characteristics) as indicated in Table 5.

**Table 5: Correlation between Aspects of Learning Outcomes and Instructional Supports**

		Cognitive Outcomes	Behavioural Outcomes	Social/Emotional Outcomes	Communication Outcomes
Use of Instructional Supports	Pearson Correlation	.299**	.125	.236**	.525**
	Sig. (2-tailed)	.000	.146	.005	.000
	N	138	138	138	138

\*\* . Correlation is significant at the 0.01 level (2-tailed).

The findings of the study show that there was significant positive correlation between use of instructional supports and three aspects of learning outcomes; cognitive outcomes ( $r = .299, p < .05$ ), social/emotional outcomes ( $r = .236, p = .005$ ) and communication outcomes ( $r = .525, p < .05$ ). However, the study did not establish statistically significant relationship between behavioural outcomes and instructional supports [ $r = .125, p = .146$  (ns)]. This finding agrees with Phillips, Maria, (2016) who reported that the visual strategies helped the learners to learn vocabulary. Since learners with ASD most often display stimulus over-selectivity, teaching them to respond to a particular cue is likely to reduce inattention and enhance learning outcomes. A classroom setting should not be overwhelming or confusing for a learner with ASD.

#### IV. Conclusion & Recommendation

The findings of the study show that there were statistical significant positive correlation between use of instructional supports and three aspects of learning outcomes; cognitive outcomes ( $r = .299, p < .05$ ), social/emotional outcomes ( $r = .236, p = .005$ ) and communication outcomes ( $r = .525, p < .05$ ). However, the study did not establish statistically significant relationship between behavioural outcomes and instructional supports [ $r = .125, p = .146$  (ns)]. It was therefore concluded that implementation of use of instructional supports has positive influence on teaching and learning outcomes among the learners with ASDs. The 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. This is because the study reported that there was



generally low communication learning outcomes among learners with ASD.

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