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Communication Board (CB) Influencing Expressive Language of learners with Autism Spectrum Disorder in Migori County, Kenya

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Abstract
Autism Spectrum Disorders (ASD) is a diagnostic classification within the 4th edition of Diagnostic and Statistics for Mental Disorders, (DSMIV-TR). This study aimed to analyze how Picture Exchange Communication System (PECS) influenced Expressive Language Skills (ELS) for learners with ASD. PECS are used to teach functional communication to learners with ASD instead of using words and speech. PECS were developed by Lori Frost a speech-language pathologists together with Dr. Andrew Bondy in 1984. It was first used in learners with Autism program in Delaware with an aim of teaching learners with ASD simple way of initiating functional communication. Four objectives guided the study namely: a) Evaluating how Communication Board strategy influenced ELS for learners with ASD. b) Establishing how Visual Support strategy influenced ELS for learners with ASD. c) Analyzing how Picture Icon strategy influenced ELS for learners with ASD. d) Assessing the extent Routine Cards influenced Expressive Language Skills (ELS) for learners with (ASD) in regular primary schools in Migori County. Researcher adopted Social Influence theory Mill (1790) in the study. Study local was regular primary schools educating learners with ASD in Migori County. Descriptive survey design was employed for this study. Target population of 395, comprising 120 teachers, 40 headteachers, 107 parents, 8 EARCs officers, 120 learners with ASD experiencing challenge in expressive language deficit. Purposive and simple Random sampling techniques were used to select 12 schools as a sample unit, 12 headteachers, 36 teachers, 36 learners with ASD, 32 parents/guardians,08 EARCs officers each from each sub-county, as it allows handpicking of responded based on specified criteria. Piloting was done in one of the regular primary school teaching learners with ASD within Rongo sub-County to determine the validity and reliability which yielded a coefficient of 0.750 that was used to assess the reliability. Data collection tools used were observational schedules and checklists for learners, Questionnaires for teachers and head teachers, interviews for parents. Themes and narrative were used to analyze qualitative data while quantitative data was analyzed using descriptive statistics and inferential statistics. The main findings of the study was that picture exchange communication system that is used is communication boards, visual supports and pictorial icons and except the use of routine cards influenced expressive language of learners with ASD in regular primary schools in Migori County, Kenya. Recommendations of the study included: Children are supposed to be introduced to the Communication Board by their parents so as to enhance their improvements on Expressive Language Skill (ELS). Teachers should enhance the usage of visual Support in the classroom as it has enabled learners with ASD to process language and understand new words. The use of Picture Icon in the classroom should be effectively executed as it enables learners with ASD to process language, it also enables learners with ASD to understand new words and learn specific activities.

Key words: Visual Support, Expressive Language, Learners with Autism, Spectrum Disorder

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Introduction

Autism Spectrum Disorders is a neurodevelopmental disorder that largely affect not only social interaction but also verbal and non-verbal communication. Restricted repetitive behaviors affect learner's performance, and it becomes evident at age 3 (Kerubo, 2018). Expressive language Skills (ELS) is the use of language through needs, written, spoken, picture or signs, desire, and thoughts appropriately (Logsdon,2021). Deficit in expressive language skills may lead to lack of functional communication skills. These can either be drawings, photographs, or animation techniques to be used by the teacher to show ASD learners how things function in real life, making learning more concrete or actual. Visual Support (VS) provides meaningful learning environment in the classroom, as they help teachers to guide learners on how things work in real life, explains more on how to deal with certain situations and people, about feelings and relationships in a manner they can easily understand, (Norris, 2018). A communication board is a sheet of symbolic logo or letters and real-life pictures that a learner will point to communicate with others. Communication board supports interactions between a child to a child and/ or adult to make comments, requests or give a direction to each other (Nurdiati, 2020).

A study conducted in New York by (Rose et al.,2020) explored progress on Signs of Expressive -Language on learners with ASD using Comprehension Intervention infused with Augmentative and Alternative Communication **(**AAC). Sample population used were 46 learners with ASD aged between 2 -6 years, pre-test and post-test were done, chronological age, intelligent quotient (IQ) and autism spectrum disorder (ASD) signs and symptoms were found to be having no effects on learners with ASD expressive Language skills. Augmentative and Alternative Communication **(**AAC) factors brought about changes on learners' Expressive-Language change on Visual attention, word learning, and objects play, accounting for 42% of the total change in Expressive Language of the learners with ASD. The study was done in America while the current study was done in regular primary schools in Migori County, Kenya.

Tönsing et al., (2018), explored views of people with complex communication needs in South Africa. The scholar used Augmentative and Alternative Communication (AAC) and Multilingualism, to describe communication modalities and languages used by people with complex communication needs to interact. Sample population were 27 adults, research tools used were face to face interviews and questionnaires. Descriptive statistics was used to analyze data as opposed to the current study that utilized more than one. Findings showed that when speech – generating device (Aided system) were used by these people, their expressive language repertoire desire increased. However, this study focused on Expressive Language Skills on learners with ASD in regular primary schools.

Another study in Uganda by (Holyfield, 2021), explored the effectiveness of text - only AAC and text - paired with picture symbol on communication of preliterate learners with ASD. Sample populations were 4 learners, and a single subject-subject study design was used. The studies had phases such as intervention, baseline, generalization, and maintenance. Findings

showed an increased maintained and generalized communication across all conditions presented. The Reviewed study explored effectiveness of text- only AAC and text- paired with picture symbol on communication of preliterate learners with ASD using only 4 learners. This study however explored how PECS influenced Expressive Language Skills of learners with ASD.

Obianga and Cloete (2019) of Kenya, explored caregivers' perspective on barriers in crucial services access in managing Learners with ASD. The study design used was qualitative, descriptive phenomenological while data collection technique was Focus Group Discussions (FGDs), and study locale was the clinic of Occupational therapists at Kenyatta National Hospital. Six caregivers were purposively sampled; the data analysis used was Inductive content analysis. Results showed the need for early diagnosis, comprehensive legislation strategy, treatment and support for caregivers and learners with ASD**.** The reviewed study explored on caregivers' perspective on barriers to crucial access of services and managing Learners with ASD. The current study used Descriptive design to a certain how PECS influences Expressive Language Skills in learners with ASD in regular primary schools. While the reviewed study used qualitative, descriptive, and phenomenological study design.

Purpose of the Study

This study aims to analyse how Communication Board (CB) influenced Expressive language Skills (ELS) of learners with ASD in regular primary schools in Migori County, Kenya.

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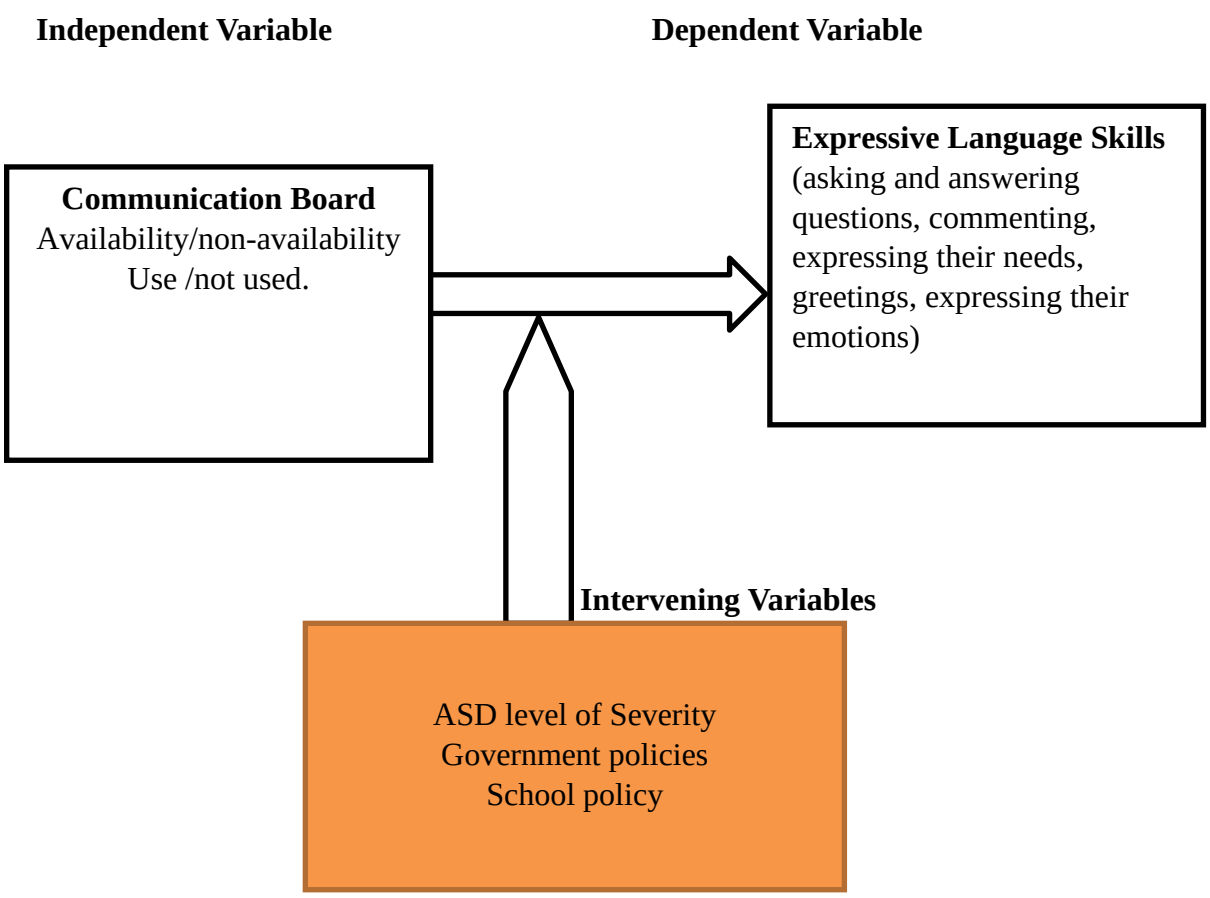
Figure 1 Conceptual Framework



Source: Researchers 2024

Theoretical Framework

Social Influence Theory developed by James Mill in 1790s was used in this study. The theory was later adapted by B.F. Skinner in 1920's and updated by Robert. B. Cialdini in 20th century. One of the major principles of this theory is based on persuasion which is the ability to move people towards a desired direction (Cialdini, 2021). Thus, Visual Support was presented to attract, persuade and influence learners with ASD expressive language skills deficit (Cialdini, 2021). Visual Support provided visual influence on learner with ASD Expressive Language Skills deficit, as people do influence each other either verbally or non-verbally as they socially interact. Similarly, Visual Support provided these learners with an alternative means of communication, thus, influencing thinking, feelings, acceptance, and confidence of other people around them and be able to express their needs, wants and feelings appropriately.

Methodology

Research Design and Target Population

Descriptive survey design was used for the study, as it blends quantitative and qualitative approaches to provide accurate information on the interrelationship of variables. The researchers' choice of the design was based on the fact that it enables one triangulate data sourced qualitatively and quantitatively. In addition, the researcher can acquire a more comprehensive data to evaluate how Communication Board influenced Expressive Language Skills of learners with ASD (Orodho et al.,2016). Migori County is sub-divided into eight sub-counties and all the sub-counties participated in the study. The study targeted 40 regular primary schools serving learners with ASD according to the (2019) Ministry of Education through the County Director of Special Needs Education in Migori County, Kenya. All the 40 regular primary schools distributed among the eight sub-counties were targeted for the study as well as 8 Educational Assessment Resource Coordinators (EARCs) officers. Forty (40) headteachers representing each school due to their managerial positions in these schools, 120 teachers teaching learners with ASD, 120 learners with ASD experiencing challenge in expressive language deficit were targeted. One-hundred and seven (107) parents of learners with ASD were also included in the study as the use of PECS were used even at home, necessitating the inclusion of parents in the study for intervention continuity. Total target population for the study was 395 respondents.

Sampling Techniques and Sample Size

Purposive sampling technique was used to select 12 schools as a sample unit, 12 headteachers, and 08 EARCs officers from each sub-county and as it allows handpicking of responded based on specified criteria, while 36 teachers from the sampled schools were generated using simple Random sampling. 36 learners with ASD, 32 parents/guardians were randomly sampled as the technique gives respondents equal opportunity to participate in the study.

Research Instruments

Observation Checklists, Interview schedule and Questionnaires aided the researcher in collecting data. The researcher used questionnaires on EARCs Officers, Headteachers and teachers as they were educated and could read for themselves and understand. Observation checklists were used on learners with ASD to assess them in their natural settings and interview schedules were used on parents.

Piloting

Pre-testing research tools is key. Piloting aid the researcher to find out if research instruments would work well, to inform the researcher on any ambiguity on the locally made questionnaires, to inform the researcher on any researchers' bias on language to assess if the selected questions are clear and are study focused. Piloting was done in a regular primary school in Rongo Sub-County, within Migori County, sharing a similar characteristic as of the actual sampled regular primary schools within Migori County Orodho (2017). Feasibility evaluation of data management and data collection instruments was done using results from piloting Orodho (2017). Piloting was done a month before the actual study; this gave room for improvement to be done on data collection instruments as well as data contents. The school was later omitted in the actual study size to avoid interference of the study results by respondents and data duplication.

Validity of Instruments

In order to ascertain if research findings were meaningful validity of the instruments was established. Quantitative and qualitative data validity was established Orodho (2016). Thus, validation of quantitative data was to ensure the questionnaires had relevant items to test the study objectives. While qualitative data validation was done by integrating interview schedules and observation checklist. Validity of questionnaires was done by cross-checking items and ensuring all questions were answered based on the study objectives. Construct validity was attained based on observable characteristic indicators showing the achievement of the intended study.

Reliability of the Research Instruments

Research instruments used were a questionnaire, an observation checklist and an interview schedule which allowed triangulation as it enhanced the efficacy as well as reliability of the result. Data which was collected using the three instruments were triangulated to affirm the reliability of the result. Expert guided the development of instruments by cross-checking every item in the content of questionnaires, interview schedules ensure appropriate reliability, as well as coding of the data fed in the Statistical Package for Social Science (SPSS) and coefficient 0.75 was used to assess the reliability of the study instruments (Orodho, 2016).

Data Collection Techniques

Data collection took eight weeks due to Migori County vastness, as each sub- county was allocated one week. The researcher had to make proper arrangements for the research expenses in advance for the success of the study (Orodho et al., 2017). On each of the subsequent Mondays, the researcher went to the EARC's offices of each sub-county by 8:30 am and presented letter of authorization from county commissioner and ministry of education offices, Migori. Then researcher would present the questionnaire to the EARC which would take only a couple of minutes to be filled. All the questionnaires to the EARC's were responded to and collected by the researchers on spot.

The researcher would then move to one sampled regular primary school before lunch break and attended a second school in the afternoon of the same day within the same sub-county and present the authorization letters from Migori county commissioner and ministry of education offices to the headteacher who intern invited the relevant teachers who are teaching learners with ASD to handle the questionnaires as the headteacher also handled his. The researcher immediately collected the answered questionnaires from head-teachers and teachers on the same day. Researcher did not come across any head-teacher who needed more time to submit except for a few teachers who needed more time to answer their questionnaires hence the research gave them three days to complete their questionnaires. The same headteachers organized with the respective teachers on how learners with ASD would be observed and how parents would be interviewed. In one school the interview for parents was conducted on Wednesday between 9am and noon and then the second school worked it out on Thursday between the same time for every sub-county. The researcher used observational checklist to observe learners with ASD while on their natural setting i.e. during breaktime, while doing some class work in classroom as well as during their free time to assess how they use varied PECS strategies to express themselves. The

researcher interviewed the Parents of learners with ASD on how their children with ASD communicates to their peers as well as their parents too while at home.

Data Analysis

Descriptive statistics analysis aided the researcher to simplify large quantitative data using graphs and tables. Qualitative data were transcribed by putting data into a text-based format that is codes and themes to determine the relationship or the trends in the themes. The researcher further conducted a multiple linear regression to examine how well different independent variables of PECS predicted the level of use of expressive language skills for learners with ASD. The study also applied Pearson's Moment correlation to establish the relationship between the two variables using the equation $Y=\text{Constant} +\beta_1X_1 +\beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$. and 0.05 Alpha value and linear regresión analysis as amulti-variant technique that aided the researcher to determine the influence of PECS on ELS.

Where: Y = Expressive Language Skills

X_1 = Use of Communication Boards
X_2 = Use of Visual Supports
X_3 = Use of Pictorial Icons
X_4 = Use of Routine Cards
ε = error term

The researcher provided statistical significance amongst the variables using SPSS Version 26. Inferential statistics analysis was used to address all the four-research objectives, as it allowed the researcher to assess if the data were generalizable to the broader population of Migori County, after using sample size of the target population in the study.

Demographic Information

The respondents' ages and genders were determined for this investigation.

4.2.3 Gender of the Respondents

Sampled Educational Assessment Resource Coordinators (EARCs), head teachers and teachers were requested indicate their gender as presented in Figure 4.1.

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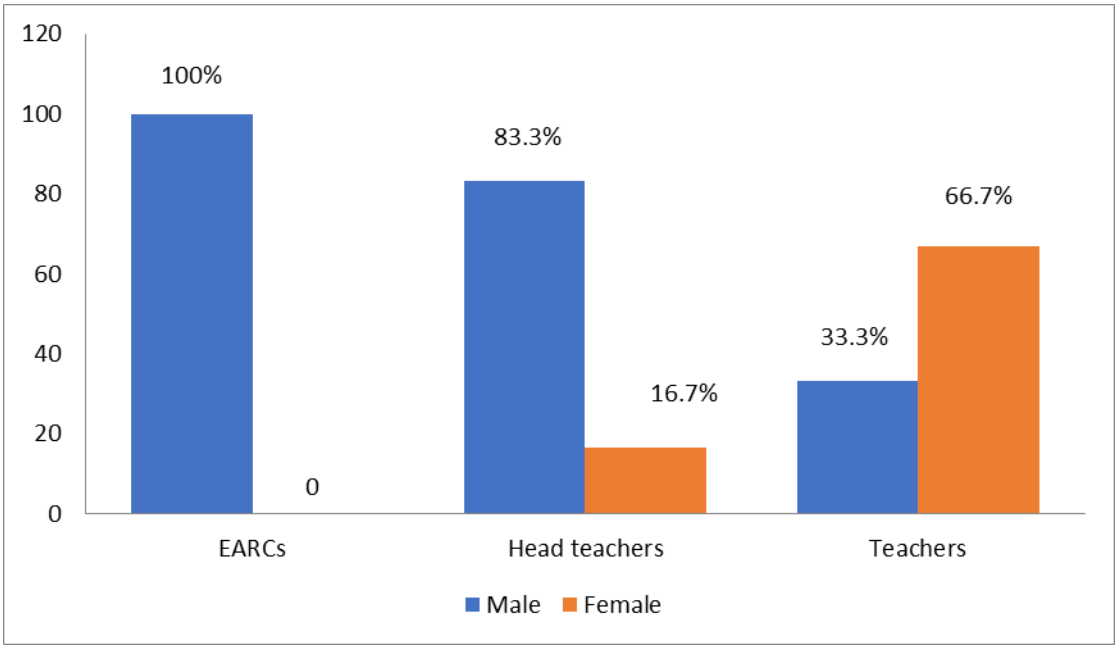


Figure 4.1: Gender of the Respondents
Source: Researchers (2024)

As indicated in the above Figure 4.1, all of the Educational Assessment Resource Coordinators (EARCs) were male because no females were recorded; the majority of the head teachers were male, with three quarters 10 (83.3%) being male and less than a quarter 2(16.7%) being female; interestingly, the study recorded more female teachers, with two thirds 24 (66.7%) being female and a third 12 (33.3%) being male. It was in line with expectations of the researcher by sampling both genders (male and female) teachers with an aim of examining how Picture Exchange Communication System (PECS) influenced ELS of ASD pupils in regular primary schools in Migori County, Kenya.

4.2.4 Age of the Respondents.

Respondents were requested to state their ages on the questionnaire and the results were tabulated in Table 4.1.

Table 4.1: Age of the Respondents (EARCCs N=8, Head Teachers N=12, Teachers N=32)

Age in Years	EARCCs	Head Teachers	Teachers
Mean	55.5	52.8	40.9
Standard Deviation	5.78	4.09	8.45
Minimum	48.00	48.00	26.00
Maximum	63.00	59.00	59.00

Source: Researcher (2024)

Table 4.1 shows that Educational Assessment Resource Coordinators (EARCs) were 55.5 years old on average, as 48 years old indicated the youngest. The oldest was 63.0 years old; the survey

also indicated that head teachers were 52.8 years old on average, with the youngest ageing 48.0 years while 59.0 years marked for the oldest. The average age of the teachers was 40.9 years, with the youngest teacher being 26.0 years of age and the oldest being 59 years old. Kini and Podolsky (2016) discovered a positive relationship between teaching experience related to age and advances in student achievement across a teacher's career. With increased experience, teachers can expect their students to perform better on success markers. Teachers who are older are more likely to have subject matter or area of specialized experience, and their efficacy grows more quickly. More experienced teachers benefit their coworkers, students, and the school as a whole.

Findings

From the findings, there was a statistically significant correlation in the use of communication boards and expressive language skill by learners with ASD r (32) = .452*, p<.018) at 95% confidence level with 180 degree of freedom. This was because p (.018) was less than (0.05) alpha value and therefore being statistically significant.

Regression Analysis

After conducting a multiple linear regression to examine how well different independent variables of PECS predicted the level of use of expressive language skills for learners with ASD using the equation Y = Constant +β_1X_1 +β_2X_2 + β_3X_3 + -β_4X_4 + ε.

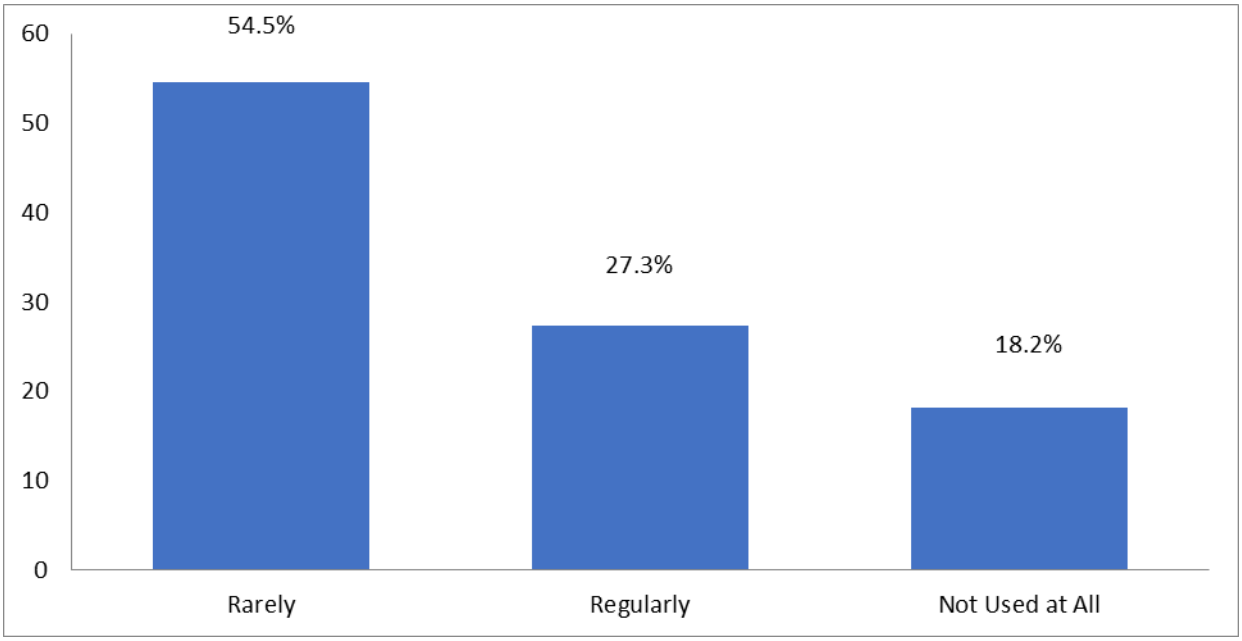
The findings show a prediction that for every unit variation in use of communication Board, there was 35.5% decrease in progress in expressive language skills for learners with ASD.

Frequency of Communication Board being used

According to Figure 4.2, the majority of teachers 13 (36.1%) rarely used communication boards in influencing the expressive language skills of learners with Autism; the study findings also revealed that 11 (30.6%) of the respondents, teachers regularly used communication boards, 5 (13.9%) frequently used it, and 7(19.4%) did not use communication boards at all.

The study first sought to establish the availability of picture exchange communication system (PECS) in the respective schools; in response, the headteachers, 9 (75.0%) indicated that PECS were available in their schools to assist learners with ASD develop Expressive Language Skills. On the other hand, 24 (66.7%) of the teachers confirmed the availability of communication boards in influencing the strategies of evaluating expressive language skills of learners with Autism in their respective schools where communication board is frequently used as presented in Figure 4.2.

The head teachers were asked to state how often PECS were used in their respective schools to assist learners with ASD develop Expressive Language Skills and Figure 4.3 presents the findings.



Source: Researcher (2024)

Use of Communication Boards on Learners with ASD

The findings show that teachers agreed (M=4.03, SD=0.61) that using Communication Boards in the classroom enabled learners with ASD to learn different ways of expressing themselves, as indicated in Table 4.2. The findings clearly indicate that respondents strongly agreed (M=4.22, SD=0.59) that utilization of Communication Boards in classrooms enabled learners with ASD to use new words for various reasons such as commenting, asking questions, and requesting different things; teachers also strongly agreed (M=4.19, SD=0.71) that the lack of Communication Boards in classrooms hindered learners with ASD to process language.

The study findings revealed that respondents strongly agreed (M=4.28, SD=0.70) that a lack of Communication Boards in the classroom hindered learners with ASD from learning different ways of expressing themselves, and strongly agreed (M=4.03, SD=0.61) that a lack of Communication Board in the classroom hindered learners with ASD from using new words for various reasons such as commenting, asking questions, and requesting different things. The study's findings revealed that (M=4.36, SD=0.54) strongly agreed that they will effectively use Communication Boards to assist ASD learners who lack Expressive Language Skills and (M=4.39, SD=0.55) strongly agreed that they appreciated the use of Communication Boards to enhance expressive language skills in ASD learners.

The current study concurs with Rose et al., (2020) who conducted in New York which explored progress on Signs of Expressive -Language on learners with ASD using Comprehension Intervention infused with Augmentative and Alternative Communication **(**AAC). On a population of 46 learners with ASD aged between 2 -6 years, chronological age, IQ and ASD signs and symptoms were found to be having no effects on learners with ASD expressive Language change**.** Augmentative and Alternative Communication **(**AAC) factors

brought about changes on learners' Expressive- Language change on Visual attention, word learning and objects play, which accounted for 15 (42%) of the total change in Expressive Language of the learners with ASD. Regionally this was confirmed by Tönsing et al., (2018) in South Africa who explored views of persons using Augmentative and Alternative Communication (AAC) and Multilingualism due to complex communication needs to describe communication modalities and languages used by these people to interact. The study results showed that when Speech –generating devices (Aided system) were used by these people, their expressive language repertoire desire increased. In Kenya Obaigwa and Cloete (2019) who explored care givers perspective on barriers in crucial services access in managing Learners with ASD; showed the need for early diagnosis, comprehensive legislation strategy, treatment and support for caregivers and learners with ASD**.**

Correlation between Use of Communication Boards and Expressive Language Skills

In order to establish whether there was a significant correlation between the use of Communication Boards and Expressive Language Skills by the learners with ASD the study applied Pearson's Moment correlation to establish relationship between the two variables. Table 4.3 presented the results.

Table 4.3: Relationship between the Use of Communication Boards and Expressive Language Skills

			USE OF COMMUNICATION BOARD	EXPRESSIVE LANGUAGE SKILLS
PEARSON'S MOMENT CORRELATION	Use of Communication Board	Correlation Coefficient	1.000	0.452*
		Sig. (2-tailed)	.	.018
		N	32	32
	Expressive Language Skills	Correlation Coefficient	0.452*	1.000
		Sig. (2-tailed)	018	.
		N	32	32

*Correlation is significant at the 0.05 level (2-tailed)
Source: Researchers (2024)

Table 4.3 describes the findings. From the findings, there was a statistically significant correlation in the use of communication boards and expressive language skill by learners with ASD r (32) = .452*, p<.018) at 95% confidence level with 180 degree of freedom. This was because p (.018) was less than (0.05) alpha value and therefore being statistically significant.

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Conclusion

Influence of Communication Board on Expressive Language Skill (ELS)

The first objective sought to establish influence of communication board on expressive language skill (ELS). The findings show that using Communication Boards in the classroom enabled learners with ASD to learn different ways of expressing themselves. According to the findings, the utilization of Communication Boards during teaching learning process enabled learners with ASD use new words for various reasons such as commenting, asking questions, and requesting different things; lack of Communication Boards in classrooms hindered learners with ASD to process language. It was also evident from the study findings that lack of Communication Boards in the classroom hindered learners with ASD from learning different ways of expressing themselves, and that a lack of Communication Boards in the classroom hindered learners with ASD from using new words for various reasons such as commenting, asking questions, and requesting different things. The study's findings revealed that teachers effectively use Communication Boards to assist many ASD learners who lack Expressive Language Skills, and they appreciated the use of Communication Boards to enhance expressive language skills in ASD learners. There was a statistically significant correlation the use of communication boards and expressive language skill by learners with ASD.

Recommendations

The parents are encouraged to teach and make their children to freely express their needs on the Communication Board. Children are supposed to be introduced to the Communication Board by the parents so as to enhance their improvements on Expressive Language Skill (ELS). Through use of multiple linear regression, it was clearly explained how well the use of communication boards, but not other picture exchange communication systems, predicted the level of learners with ASD using Expressive Language Skills; a similar study addressing qualitative aspects should be conducted in order to generate conclusive findings that can mirror actual position on the ground that in turn would allow findings to be generalized.

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