Parental And Teachers Involvement As Correlates Of Special–Need Pupils' Interest And Achievement In Mathematics

Mercy N. Nwoye[1], Chika C. Ugwuanyi[1], Emeji Eucharia Ifeoma[1*], Juliana Obiageli Nwosu[2], Osakwe Ifeoma Julie[1], Joseph Bethel Chukwuemeka[1], Shiaki Onesimus Bulus[3], Basil C.E. Oguguo[1], Kenneth E. Okpe[1], Lovina Ijeoma Okpara[1], Blessing Ngozi Ojobo[1]

Abstract

This study was carried out to investigate the parental and teacher's involvement as correlate of special-need pupils' achievement and interest in mathematics. The researchers adopted a correlation research design and the area of study was the special-needs schools. Four (4) special schools were selected through purposive sampling technique. The instruments used for data collection were: (i) parental involvement scale (PIS), (ii) Teachers involvement scale (TIS) and (iii) Special-needs pupils interest scale (SPIS). Each of the instruments was structured on a four-point rating scale by the researcher. The research instruments were face-validated by two experts in science education and one expert in special education. Cronbach Alpha technique was used to ascertain the internal consistency of the instruments and reliability indices of 0.96, 0.96 and 0.93 were obtained for PIS, TIS and SPIS respectively. The data collected was analyzed using the regression analysis and analysis of variance regression analysis was used to test the hypothesis at 0.05 level of significance. The finding of the study showed among others that parents, teachers and interest of the special-needs pupils have positive significance in the achievement of the pupils in mathematics. Based on the findings and implications of the study, recommendations were made.

Keywords: Parental and teacher's involvement, special-need pupils, academic achievement, interest in mathematics

Introduction

Mathematics is a science discipline that harmonizes logical, rational, and analytical thinking with numbers and shapes. It serves as an essential tool for human and national development. Wilson (2015) asserts that mathematics not only opens one's mind to logical reasoning and analytical thinking but also enhances creative thinking,

[1] Department of Science Education, University of Nigeria, Nsukka, ifeoma.emeji@unn.edu.ng

[2]Department of Education Foundations, University of Nigeria, Nsukka

[3]Department of Science Education, Taraba State University, Jalingo

deep focus, and clarity of thought. Thus, mathematics is fundamentally about problem-solving. Petti (2015) defines mathematics as the science of patterns, encompassing patterns in counting, reasoning, communication, motion, change, shape, regularity, and passion. It is widely recognized as a key to success in studying science and related fields (Umaru, Onuigbo & Eze, 2013). Furthermore, Obi (2014) highlights that mathematics holds global significance as the development of a nation greatly hinges on its scientific and technological expertise.

The knowledge of mathematics plays a vital role in advancing technology and finding solutions to future challenges. Hence, it is often referred to as the gateway to science and technology (Idoko, 2016). Mathematics is pervasive across all human activities, finding applications in science, architecture, engineering, industries, aeronautics, space science, navigation, survey, and nuclear energy (Adolphus, 2011). The interdisciplinary nature of mathematics has captivated notable academics who have tried to define it in various ways. From a comprehensive understanding of these definitions, it becomes clear that mathematics serves to cultivate a habit of reasoning in the mind. As a result, mathematics has the remarkable ability to enhance an individual's thinking and logical capacity. This is achieved through the mastery and application of mathematical theories and formulas, enabling individuals to approach problems with a methodical and analytical mindset.

Obviously, mathematics is vital to human existence. However, it is also clear that many tend to avoid it due to phobia (Rejandra, 2020). If mathematics is so dreaded by persons who do not have any form of impairment in learning, then more effort and concern are needed for the 'special-need' group who also need to benefit from the vast importance of mathematics.

The special-need group refers to a culturally, ethnical, or racially distinct group that coexists with but is subordinate to a more dominant group. Those with learning disabilities (LDs) can be characterized as a special-need group and like most group of minorities, they face a distinct stigma by the large population. Many of those in this group experience difficulties in implementing some of the basic issues that form the foundations of education (Kirk as cited in Iwuama & Ekwe, 2010).

It is crucial to recognize that the special-needs learning group is not limited to individuals with learning impairments. This group also encompasses exceptionally intelligent children. In fact, every human

being faces some form of learning challenge. However, this study specifically focuses on individuals with difficulties in understanding or using languages, whether spoken or written. This group includes but is not limited to those with conditions such as Down syndrome, speech and hearing impairments, and minimal cerebral dysfunction. Learning disabilities impact one or more of the fundamental psychological processes involved in language comprehension and usage, both spoken and written. This can result in significant difficulties in listening, speaking, reading, writing, spelling, or performing mathematical calculations (Kelsay, 2021).

It is not easy to pin-point specifically, the causes of learning disabilities. However, research has unveiled that minimal cerebral dysfunction or minimal brain damage is responsible for learning disabilities. The minimal cerebral dysfunctions often take place during prenatal development and at the birth of the child (Bichler as cited in Iwuama and Ekwe 2010). Minimal cerebral dysfunction could be caused by the following factors as outlined by (Iwuama, 2010).

- Genetic abnormalities: This could be the outcome of chemical changes in a particular gene caused by dangerous drugs taken by the pregnant mother.
- Rhesus factor: This is when the Rh-factor of the pregnant mother is incompatible with that of the child in the womb.
- Lack of oxygen at birth: This can be caused by the blockage of the baby's air passage by either thick mucus or amniotic fluid or blood. Partial separation of the placenta can also lead to oxygen lack at birth.
- Malnutrition: When a pregnant mother is malnourished, the fetus will not have access to essential substance. Even at birth, the new born baby requires balance diet for brain development.

Though it is generally accepted that minimal cerebral dysfunction is the major cause of learning disabilities, some other factors combine with minimal cerebral dysfunction to result in learning backwardness. For instance, unawareness on the part of parents and teachers of the significance of the learning readiness can cause reading backwardness. For any child to learn reading or any other basic skill effectively, the child must be intellectually ready to learn.

However, some parents and teachers who are to get the child started introduce the child to calculations when the child has not developed learning readiness. This results in the child's future learning and emotional development being damaged by the early introduction of computations.

Learning backwardness can also be caused by the failure of parents and teachers to recognize the need to motivate and encourage the child adequately especially when the child makes attempts but fails. This attitude of parental and teachers towards the LDs results in making the child emotionally disorganized and fearful of repeated failure. Hence the child becomes frustrated and lacks the courage for future learning.

In order to arouse the interest of the special-need group for positive achievement in mathematics, parents and teachers should possess basic knowledge of the characteristics of children with learning disabilities (LDs).

Parental involvement is crucial for helping this group of pupils cope effectively with their academic achievements. It encompasses a variety of practices carried out by parents to enhance their children's motivation and educational success. These practices include engaging in discussions about school-related matters and monitoring their children's progress (Otani, 2017). Parental involvement is a multidimensional concept, which has made its definition challenging (Hill & Taylor, 2004). Epstein (2001) proposed six categories of parental involvement: Parenting, which involves providing emotional and moral support; Communicating, which entails open and regular communication with teachers; Volunteering, where parents contribute their time and efforts to school activities; Learning at home, which involves creating a supportive learning environment at home; Decision making, where parents participate in school-related decisions; and Collaborating within the community, which includes partnering with the community to support the educational development of children. Emphasizing these dimensions of parental involvement can greatly contribute to students' academic success and overall well-being.

Most commonly, parental involvement is categorized in home-based and school based involvement (Galindo & Sheldom, 2012). Research has shown that home-based parental involvement support consistence on positive achievement for example (Castro et al; 2015). In the same vein the teacher’s involvement is clearly related to the pupil’s achievement in mathematics.

Interest is very important for students understanding and achievement of mathematical skills and concepts. According to (Ogbodo, 2002) interest is the personal feeling of one’s preference, intentness, eagerness, likeness or concern about an object under

discussion. Interest plays a vital role in the teaching and learning of mathematics. The level of achievement in mathematics is significantly influenced by the interest students develop in the subject. When students are genuinely interested, it serves as a powerful motivator for their studies. A strong interest in a subject tends to lead to the development of good study habits, facilitating the expansion of knowledge. Ugwu (2015) defines interest as the attraction or compulsion that drives a child to respond to a specific stimulus. Essentially, any stimulus that is attractive or stimulating can spark a child's interest in that particular subject or topic. Thus, fostering and nurturing students' interest in mathematics is crucial for promoting active engagement and academic success in the subject.

Interest is important in mathematics because, it tends to facilitate effective concentration of learners in mathematical concepts. Interest has a significant impact on our cognitive functions and learning processes. Researchers have suggested that there is a considerable difference in both psychological and physiological responses when we encounter information that is interesting compared to information that is not engaging. This is supported by Sumbabi and Bassey (2013) who opined that low interest in mathematics provably leads to low achievement. It also shows that the degree and direction of students' attitudes towards mathematics is likely determined by their interest. Interest is therefore a very strong and important variable in the teaching and learning of mathematics which will obviously help to improve pupils' academic achievement in mathematics.

The researcher's concern in this work is centered more on the special-need group. To this effect, this study seeks to investigate the link among parental and teachers variables together with the interest of the learner as it affects the mathematics achievement of the special-need group.

The poor achievement on mathematics in general has been a major concern to researchers. This challenge has been attributed to various factor which include: lack of parental and, teachers' involvement, pupils' perception of mathematics, lack of interest on mathematics by pupils and poor study habit. However, pupils with learning disabilities who are also a sector of the special-need group are faced with more challenges which result in a more discouraging achievement in their mathematics performance. Since mathematics has been observed to have the ability to enhance the general mental development of individuals, it is then imperative for researchers to extend unalloyed concern towards proffering solution to the extremely poor achievement on mathematics to the special-need group.

In order to achieve the expected result, a thorough investigation should be carried out on correlating variables like parent factors, teacher factors and pupils interest. Hence, this study therefore investigates the parental and teacher's involvement as correlates the special-need pupils interest and achievement in mathematics. The general purpose of this study is to investigate the parental and teachers involvement as correlates of special-need pupils' interest and achievement in mathematics.

The following research questions were addressed:

1. What is the relationship between parental involvement and special-need pupils' achievement in mathematics?
2. What is the relationship between teachers' involvement and special-need pupils' achievement in mathematics?
3. What is the relationship between parental involvement and special-need pupils' interest in mathematics?
4. What is the relationship between teachers involvement and special-need pupils interest in mathematics?

Materials and Methods

Design of the Study

The research employed a correlation survey research design, which, according to Nworgu (2015), aims to determine the relationship between two or more variables. This design is chosen to identify the direction and magnitude of the relationship between the criterion variables, namely special-need pupils' parental and teachers' involvement, pupils' interest in mathematics, and special-need pupils' achievement in mathematics. The correlation survey design is well-suited for this study as it will help establish the nature of relationships among these variables.

Study setting and Participants

The sample size of 120 respondents constituted the sample size of the study. Purposive sampling technique was used to sample two states out of the five states in the south-eastern states of Nigeria. The two purposively sampled states were Abia and Enugu states. Two schools were chosen from each of the states making a total of four schools. The four schools were preferred for having good number of pupils in primary six (6) with fair gender distribution in each of the schools. The four schools were tagged schools A,B,C and D. 40 teachers and 40 parents were also sampled in the schools which formed part of the respondents.

Measurement

In this study, data collection involved the use of three instruments: the Parental Involvement Scale (PIS), the Teachers Involvement Scale (TIS), and the Special-Need Pupils Interest Scale (SPIS). The Parental Involvement Scale (PIS) is a twenty-item scale specifically developed by the researcher to assess parental involvement. It comprises two sections, Section A and B. Section A gathers personal data from the respondents, while Section B measures parental involvement. Responses are measured using a four-point rating scale, where Strongly Agree (SA) denotes 4, Agree (A) denotes 3, Disagree (DA) denotes 2, and Strongly Disagree (SD) denotes 1.

Furthermore, the Teachers Involvement Scale (TIS) is a twenty-item scale specifically created by the researcher to assess teachers' involvement. Similar to the Parental Involvement Scale, the TIS consists of two sections: Section A collects personal data from the respondents, while Section B measures teachers' involvement. The responses in Section B are measured using a four-point rating scale: Strongly Agreed (SA) - 4, Agree (A) - 3, Disagree (DA) - 2, Strongly Disagree (SD) - 1.

The Special-Need Pupils Interest Scale (SPIS) is a questionnaire comprising 10 items, designed by the researcher to gauge each pupil's interest in mathematics. The SPIS is assessed on a four-point rating scale: Strongly Agree (SA) - 4, Agree (A) - 3, Disagree (D) - 2, and Strongly Disagree (SD) - 1. Furthermore, the mathematics achievement score for the 1st term was collected through a proforma provided by the class teacher for primary six special-need pupils in each of the sampled schools.

Validity and Reliability of the Instruments

The instruments (PIS, TIS, and SPIS) underwent face validation by three experts from the Department of Science Education, University of Nigeria, Nsukka. One expert specialized in Measurement, one in Evaluation and Mathematics Education, and another in special education. These experts scrutinized the instruments to ensure the clarity of item statements and their alignment with the study's purpose. Their valuable comments, corrections, and suggestions were incorporated to enhance the instruments' relevance to the research problem.

The instruments were further tested by administering twenty (20) copies to a special school not included in the sampled schools. The responses from the Parental Involvement Scale (PIS), Teachers Involvement Scale (TIS), and Special-Needs Pupils Interest Scale (SPIS)

were subjected to reliability analysis using Cronbach's Alpha to determine internal consistency due to the polytomous scoring. The obtained reliability indices were 0.96, 0.96, and 0.93 for PIS, TIS, and SPIS, respectively, indicating a high level of consistency.

After briefing the pupils about the purpose of the Special-Needs Pupils Interest Scale (SPIS) to create a relaxed mood, the researchers administered the instruments to the various respondents in the sampled schools. Research assistants were trained on the administration procedures. The Parental Involvement Scale (PIS) and Teachers Involvement Scale (TIS) were administered during the Parents-Teachers Association (PTA) meeting, where personal contacts with parents and teachers were established. All completed copies of the instruments were collected on the spot.

The responses from the respondents were scored, and the data generated were subjected to statistical analysis to draw conclusions from the research.

Data Analysis

In this study, the collected data was analyzed using regression analysis to address all the research questions. Additionally, Analysis of Variance (ANOVA) regression analysis was employed to test the formulated hypotheses at a significance level of 0.05. The correlation coefficients were interpreted as follows: coefficients between 0.00 and 0.30 indicated a low relationship, coefficients between 0.31 and 0.70 were considered a moderate relationship, while coefficients between 0.71 and 1.00 were interpreted as a high relationship, following Nworgu's guidelines (2015). The null hypothesis is rejected if the exact probability value obtained is less than 0.05. On the other hand, if the probability value is equal to or greater than 0.05, the null hypothesis is not rejected.

Results

Table 1 displays the regression analysis results, examining the relationship between parental involvement and special-need pupils' achievement in Mathematics. The analysis yielded a correlation coefficient of 0.75, indicating a positive and high relationship between parental involvement and special-need pupils' achievement in Mathematics. Furthermore, the coefficient of determination obtained is 0.57, indicating that 57% of the variation in special-need pupils' achievement in Mathematics can be attributed to parental involvement.

Table 1: Regression analysis on the relationship between parental involvement and special-need pupils` achievement

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.753[a]	.566	.563	3.75564

The findings presented in Table 2 demonstrate the significance of the relationship between parental involvement and special-need pupils' achievement in Mathematics. The F-ratio was calculated to be 154.199, and a p-value of 0.000 was obtained. Since the p-value is less than the significance level of 0.05 set for decision making, the null hypothesis is rejected. Consequently, it can be concluded that there is a statistically significant relationship between parental involvement and special-need pupils' achievement in Mathematics.

Table 2: ANOVA result on the significance of the relationship between parental involvement and special-need pupils` achievement in Mathematics

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2174.953	1	2174.953	154.199	.000[b]
	Residual	1664.372	118	14.105		
	Total	3839.325	119			

Table 3 displays the results of the regression analysis, examining the relationship between teachers' involvement and special-need pupils' achievement in Mathematics. The analysis revealed a correlation coefficient of 0.79, indicating a positive and high relationship between teachers' involvement and special-need pupils' achievement in Mathematics. Furthermore, the coefficient of determination obtained is 0.62, signifying that 62% of the variation in special-need pupils' achievement in Mathematics can be attributed to teachers' involvement.

Table 3: Regression analysis on the relationship between teachers' involvement and special-need pupils` achievement

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.789[a]	.622	.619	3.50745

The findings presented in Table 4 indicate the significance of the relationship between parental involvement and special-need pupils' achievement in Mathematics. The F-ratio was calculated to be 194.084, and a p-value of 0.000 was obtained. Since the p-value is less than the significance level of 0.05 set for decision making, the null hypothesis is rejected. As a result, it can be concluded that there is a

statistically significant relationship between parental involvement and special-need pupils' achievement in Mathematics.

Table 4: ANOVA result on the significant of the relationship between teachers' involvement and special-need pupils` achievement in Mathematics

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2387.664	1	2387.664	194.084	.000[b]
	Residual	1451.661	118	12.302		
	Total	3839.325	119			

Table 5 displays the results of the regression analysis, examining the relationship between parental involvement and special-need pupils' interest in Mathematics. The analysis revealed a correlation coefficient of 0.74, indicating a positive and high relationship between parental involvement and special-need pupils' interest in Mathematics. Furthermore, the coefficient of determination obtained is 0.55, suggesting that 55% of the variation in special-need pupils' interest in Mathematics can be attributed to parental involvement.

Table 5: Regression analysis on the relationship between parental involvement and special-need pupils` interest

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.743[a]	.552	.548	7.34532

The findings presented in Table 6 indicate the significance of the relationship between parental involvement and special-need pupils' interest in Mathematics. The F-ratio was calculated to be 145.303, and a p-value of 0.000 was obtained. Since the p-value is less than the significance level of 0.05 set for decision making, the null hypothesis is rejected. Therefore, it can be concluded that there is a statistically significant relationship between parental involvement and special-need pupils' interest in Mathematics.

Table 6: ANOVA result on the significant of the relationship between parental involvement and special-need pupils` interest in Mathematics

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	7839.658	1	7839.658	145.303	.000[b]
	Residual	6366.540	118	53.954		
	Total	14206.198	119			

Table 7 displays the results of the regression analysis, examining the relationship between teachers' involvement and special-need pupils'

interest in Mathematics. The analysis revealed a correlation coefficient of 0.77, indicating a positive and high relationship between teachers' involvement and special-need pupils' interest in Mathematics. Furthermore, the coefficient of determination obtained is 0.59, suggesting that 59% of the variation in special-need pupils' interest in Mathematics can be attributed to teachers' involvement.

Table 7: Regression analysis on the relationship between teachers' involvement and special-need pupils` interest

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.771[a]	.594	.591	6.99164

The findings presented in Table 8 indicate the significance of the relationship between teachers' involvement and special-need pupils' interest in Mathematics. The F-ratio was calculated to be 172.616, and a p-value of 0.000 was obtained. Since the p-value is less than the significance level of 0.05 set for decision making, the null hypothesis is rejected. Therefore, it can be concluded that there is a statistically significant relationship between teachers' involvement and special-need pupils' interest in Mathematics.

Table 8: ANOVA result on the significant of the relationship between teachers' involvement and special-need pupils` interest in Mathematics

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	8438.002	1	8438.002	172.616	.000[b]
	Residual	5768.195	118	48.883		
	Total	14206.198	119			

Discussion

The analysis results obtained from the table clearly demonstrate the significant role parents play in the achievement of special-need pupils in mathematics. The high reliability index of 0.96 from the Parental Involvement Scale (PIS) indicates a strong correlation between parental involvement and special-need pupils' achievement in mathematics. This finding aligns with previous research by Paratore, Melzi, & Krot Sinclair (2009), who also reported that parental involvement in children's education is a crucial factor contributing to their academic success.

In a similar vein, Mcgonnel, Gavenaugh, and Gieson (2012) found a positive relationship between parental involvement and mathematics performance of learners with visual impairment. The current study's

results further confirm this finding. Conversely, the lack of or minimal parental involvement, participation, and care hampers the optimal academic achievement of special-needs pupils in mathematics. These findings are consistent with previous research conducted by Bower (2011) and Golindo (2012), which highlighted the significance of parental involvement, including helping with homework/examination preparation, structuring children's time for school work, and fostering communication between parents and teachers.

The regression analysis between teachers' involvement and special-need pupils' achievement in mathematics revealed a correlation coefficient of 0.79, indicating a positive and strong linear relationship. The coefficient of determination, 0.62, suggests that 62% of the variation in special-need pupils' achievement in mathematics can be attributed to teachers' involvement. This finding aligns with the works of Sullivan (2009) and Relich & Martin (2004), which indicate that positive teacher attitudes contribute to fostering positive pupils' attitudes. Other studies have also shown that teacher attitudes influence classroom strategies used for teaching, thereby affecting pupils' attitudes (Carpenter & Lubinski, 2010).

Furthermore, the research reveals the impact of social segregation on the academic achievement of special-needs pupils in mathematics. In line with the Education for All Handicapped Children Act (1975), which mandated education in the Least Restrictive Environment (LRE), it was required that to the maximum extent possible, students with special-needs be educated alongside typical peers. The Individualized Educational Program (IEP) team considers the placement of special-needs students in a program that promotes maximum interaction with typical peers, benefiting both the students with special-needs and those in the general education environment.

The regression analysis between parental involvement and special-need pupils' interest in mathematics yielded a correlation coefficient of 0.74, indicating a positive and strong relationship. The coefficient of determination of 0.55 suggests that 55% of the special-need pupils' interest can be attributed to parental involvement. This result is consistent with previous studies by Heinze, Reiss, and Franzisku (2005) and Yu & Singh (2016), which emphasize the crucial role of interest in mathematics learning. Similarly, a study conducted on 511 secondary school students in Nigeria by Kpolovie, Joe, & Okoto (2014) revealed a significant correlation between academic achievement and interest in learning.

The findings also support the notion that interest in mathematics can be nurtured over time, leading to improved achievement. This aligns with the interest-driven creator (IDC) theory of learning mathematics, which posits that students can develop as creators through regular engagement in interest-driven learning activities with technology support (Chan et al., 2018).

The results of the analysis on interest in mathematics revealed an F-ratio of 172.62, with a p-value of 0.00, which is less than the significance level of 0.05 set for decision making. This indicates a significant relationship between teachers' involvement and special-need pupils' interest in mathematics. Furthermore, the regression analysis of the instruments showed a correlation coefficient of 0.77, indicating a positive and strong relationship between teachers' involvement and special-need pupils' interest in mathematics. These findings align with the research of Hill and Chin (2010), who suggested that teachers play a crucial role as the most important school-related factor influencing pupils' interest in learning, including mathematics.

Conclusions

The findings of the study showed that parents and teachers of the special-needs pupils play significant roles in arousing the interest of the special-needs pupils in mathematics which consequently result in their improved achievement in mathematics. Most parents who enroll their wards in special schools demonstrate sufficient commitment towards the welfare of their special-need children. There was strong correlation among parental and teacher’s involvement together with the special-needs pupils interest and achievement in mathematics. The study however, identified some loopholes in the part of the parents and teachers of the special-need pupils which were revealed in some of the items in the instruments hence, formed the militating factors against the achievement of the special-needs pupils in mathematics. Special-need pupils can improve significantly in their achievement in mathematics if parents and teachers collaborate to arouse their interest in mathematics. Thus, there is need for parents and teachers of the special-need pupils to be well informed on the psychology and teaching methodology required to enhance the interest and achievement of the special-need pupils in mathematics.

Acknowledgments

The researchers are very grateful to all their colleagues and the authors whose studies were made use of during the course of this study

References

Adolphus, T. (2011) Problems of Teaching and Learning of Geometry in Secondary Schools in Rivers State, Nigeria. International Journal of Emerg, Science 1(2): 143-152.

Bower, H. A., & Griffin, D. (2011). Can the Epstein model of parental involvement work in a high-minority, high-poverty elementary school? A case study. Professional School Counseling, 15(2), 77-87.

Carpenter, T., & Lubinski, C. (2010). Teachers' attributions and beliefs about girls, boys and mathematics. Educational Studies in Mathematics, 21, 55-69.

Castro, M., Expósito-Casas, E., López-Martín, E., Lizasoain, L., Navarro-Asencio, E., & Gaviria, J. L. (2015). Parental involvement on student academic achievement: A meta-analysis. Educational Research Review, 14, 33-46.

Chan, T., Looi, C. K., Chen, W., Wong, L., Chang, B., Liao, C. C.,…Ogata, H. (2018). Interest-driven creator theory: Towards a theory of learning design for Asia in the twenty-first century. Journal of Computers in Education, 5(4), 435-461.

Epstein, C. M. (2001). The effects of parental involvement on students' academic self-efficacy, engagement and intrinsic motivation. Educational Psychology, 30(1), 3-74.

Galindo, A.S. & Sheldom,F.A.(2012). Mathematics instruction and its relationship with parents and teachers of secondary students in Malaysia. International Journal of Research and Analytical Reviews, 5(3), 451y-455y. https://doi.org/10.7763/ijssh 2016.v6.630

Galindo, C., & Sheldon, S. B. (2012). School and home connections and children's kindergarten achievement gains: The mediating role of family involvement. Early Childhood Research Quarterly, 27(1), 90-103.

Heinze, A., Reiss, K., & Franziska, R. (2005). Mathematics achievement and interest in mathematics from a differential perspective. ZDM, 37(3), 212-220.

Hill, N. E., & Taylor, L. C. (2004). Parental school involvement and children's academic achievement pragmatics and issues. Current Directions in Psychological Science, 13(4), 161–164.

Idoko, S. (2016). Classroom and school factors affecting mathematics achievement: A comparative study of the U.S. and Australia using TIMSS. Retrieved from http://research.acer.edu.au/tims

Iwuama, B.C., & Ekwe, S (2010). Exceptionality and special education. In: Iwuama, B.C. and Ekwe, A.O. (Eds.) Exceptional children and special education, (pp. 1-34). Owerri: Versatile Publishers.

Iwuama, B.C., (2010). Exceptionality and special education. In: Iwuama, B.C. and Ekwe, A.O. (Eds.) Exceptional children and special education, (pp. 1-34). Owerri: Versatile Publishers.

Kelsay, D.A. (2021). Attitude, motivation, and parent's role perceived by sixth grade students in relation to their achievement in mathematics. International Journal of Academic Research, 5(4), 227-230. https://doi.org/10.7813/2075-4124.2013/5-4/B.34

Kpolovie, P. J., Joe, A. I., & Okoto, T. (2014). Academic achievement prediction: Role of interest in learning and attitude towards

school. International Journal of Humanities Social Sciences and Education, 1(11), 73–100.

Nworgu, B. G. (2015). Educational research methodology. Nsukka: Hallman.

Obi, M. P. (2014). Predicting achievement in mathematics in adolescent students: The role of individual and social factors. Journal of Early Adolescence, 33(4).

Ogbodo, G. C. (2002). Developing positive attitude and interest of mathematics students in Nigeria secondary schools. A paper present at the NMC Abuja during the summit workshop, on 4-6 October, 2002.

Otani, M.D. (2017). Parent-teacher-student discrepancies in academic ability beliefs: Influences on parent involvement. School Community Journal, 20(2), 115-136.

Paratore, J., Homza, A., Krol-Sinclair, B., Lewis-Barrow, T., Melzi, G., Stergis, R. & Haynes, H. (1995). Shifting boundaries in home and school responsibilities: The construction of home-based literacy portfolios by immigrant parents and their children. Research in the Teaching of English, 29, 367–389.

Petti, M. F.(2015). Linking parent and community involvement with student achievement: Comparing principal and teacher perceptions of stakeholder influence. American Journal of Education, 116(1), 1-32.

Rajendra, S. K. (2020). Relevance of foundation of education curriculum from indigenous knowledge perspectives: Post-graduation teachers' and students opinions. International Journal of Creative Research Thoughts (IJCRT), 8(11), 3606-3621.

Relich, J., Way, J., & Martin, A. (2004) Attitudes to teaching mathematics: Further development of a measurement instrument. Mathematics Education Research Journal, 6(1), 56-69.

Sullivan, P. (2009). The impact of a pre-service mathematics education on beginning primary teachers. Research in Mathematics Education in Australia, 8, 1-9.

Sumbabi, U. T., dan Bassey, U. A. E. (2013). The effect of mathematical games and simulations on senior secondary school students interest in geometry. Journal of Research in National Development, 11(2), 330 – 337.

Ugwu, G. C. (2015). Influence of parent-child communication on pupils'self-esteem and interest in school learning. Journal of Research and Practice in Childhood Education, 1(2), 111-124.

Umaru, Y., Onuigbo, L.N. & Eze, U. N. (2013). Effect of metacognitive skills on mathematics self-efficacy beliefs of low achieving students in senior secondary schools. Institute of Education.

Wilson, P. H., Sztajn, P., Edgington, C., & Myers, M. (2015). Teachers' uses of a learning trajectory in student-centered instructional practices. Journal of Teacher Education, 66(3), 227-244.

Yu, R., & Singh, K. (2016). Teacher support, instructional practices, student motivation, and mathematics achievement in high school. The Journal of Educational Research, 1–14.