Mother-Tongue Instructional Strategy and Senior Secondary School Students' Academic Achievement in Mathematics Word-Problems in Oyo South Senatorial District, Nigeria

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ABSTRACT

The persistent underachievement of students in Mathematics word problems across secondary schools in Nigeria remains a major concern, largely due to ineffective teaching methods, language-related challenges, and a limited focus on critical thinking. This study examined the effect of mother-tongue instructional strategy on the academic achievement of Senior Secondary School students in Mathematics word problems within Oyo South Senatorial District, Nigeria. One hypothesis was tested at the 0.05 level of significance. The study adopted a pretest–posttest quasi-experimental design involving 140 SS II students selected from two randomly chosen schools. A validated self-structured Mathematics Word Problems Achievement Test (MWPAT) (KR-20= 0.89), was used for data collection. Data were analyzed using Analysis of Covariance (ANCOVA). The findings revealed a significant effect of mother-tongue instructional strategy on students' achievement in Mathematics word problems ($F_{(1; 137)} = 26.903$; $p < 0.05$). The study concluded that teaching through the mother tongue notably improved students' academic achievement in Mathematics word problems. The study recommended the adoption of mother-tongue instructional strategy as an effective strategy for enhancing students' comprehension and success in Mathematics word problems.

Keywords: Mother-tongue Instruction, Academic Achievement, Mathematics, Word-problems.

INTRODUCTION

Mathematics is the study of quantities and relationships through the use of numbers and symbols. Beyond fostering numerical literacy, school Mathematics is intended to develop individuals capable of critical thinking, problem-solving, and informed decision-making. In today's rapidly evolving world, Mathematics plays a pivotal role in technological and scientific advancement, making its effective teaching and learning more important than ever (Zhu, 2023; Usmonov, 2024).

The teaching and learning of Mathematics are considered central within educational systems due to its distinctive characteristics. Scholars have emphasized the importance of understanding Mathematics not only as a set of concepts but as a tool for solving real-life problems and analyzing ideas across disciplines. The highlights in Mathematics displays visual, abstract, hierarchical, problem-solving, and discovery-oriented nature, all of which have profound implications for instructional methods (Gökçe & Güner, 2021). As a result, stakeholders such as educators, parents, curriculum planners, and government agencies have collaborated to structure Mathematics curriculum across Nigeria's educational system; primary, secondary, and tertiary institutions to ensure a coherent sequence of concepts designed to build complexity and reinforce learning at each level. At the secondary school level, branches of Mathematics include; mensuration, algebra, geometry, statistics, functions, and word problems, which are carefully sequenced to ensure gradual advancement in complexity and technicality. This structure is intended to promote repetition, reinforce comprehension, and enhance students' appreciation of Mathematics at increasing levels (Okigbo & Okeke, 2021).

Mathematics underpins scientific, technological, and economic development, as well as daily decision-making. Yet it remains a daunting subject for many students. Among its components, word problems are particularly challenging. These problems require not only accurate computation but also the ability to interpret real-world

contexts and translate them into mathematical expressions. This dual demand linguistic comprehension and numerical reasoning in making word problems a true test of multidimensional cognitive ability (Baysal & Sevinc, 2022; Usmonov, 2024).

Solving word problems calls upon students' logical reasoning and critical thinking. These tasks compel learners to analyze language, interpret meaning, and apply mathematical strategies cohesively. The process also supports cognitive development and caters for different learning styles. For instance, visual learners benefit from connecting abstract concepts to concrete scenarios, such as dividing a candy bar among friends to understand fractions. Mathematics thus becomes not just a subject, but a bridge between conceptual understanding and real-life applications (Zhu, 2023; Yakusak & Yusuf, 2022).

Academic achievement is defined as the extent to which students attain educational goals, which is a key indicator of educational success. It is typically measured through grades, test scores, project performance, and other academic milestones. Academic Achievement is also shaped by several factors, including student effort, the quality of instruction, access to learning materials, support systems, and socio-economic context (Munir, Faiza, Jamal, Daud, & Iqbal, 2023). While academic achievement does not wholly define a student's potential, it remains a critical gateway to future opportunities.

Mathematics being a core component in daily life activities is essential for nurturing logical and analytical thinking. Yet, the performance in Mathematics, especially in solving word problems, remains a concern. Word problems require students to merge linguistic interpretation with mathematical reasoning, a process many find daunting (Engmark, Norén & Öystilä, 2024). These problems offer a rich opportunity to connect classroom learning to real-world relevance, through teaching students with persistence, flexibility, and creative thinking. Unfortunately, many students still underperform in this area. Research shows that language barriers and instructional strategies significantly affect how students comprehend and solve word problems (Baysal & Sevinc, 2022; Purcar et al., 2024).

A major barrier is the poor comprehension of language used in word problems, often leading to misinterpretation or incorrect applications of mathematical operations. This issue is intensified by teaching approaches that rely more on memorization than on conceptual understanding. In multilingual settings like Nigeria, where instruction is often delivered in a second or third language, students may struggle to decode problem statements before engaging in the actual Mathematics activities (Daróczy, 2023; Cacho, Lladonez, Villenes, Macabuhay & Valerio, 2024).

These difficulties erode confidence and reduce students' motivation to be engaged with Mathematics activities. More importantly, language barriers create gaps in the educational systems through building of foundational problem and incompetencies. Addressing these challenges requires innovative teaching strategies that cultivate both basic and higher-order cognitive skills (Unson, 2021; Daróczy, 2023).

Various interventions have been tested over time. Traditional direct instruction effective for teaching procedures, often fails to nurture analytical thinking needed for word problems. Heuristic strategies such as pattern recognition and simplification help, but they do not fully address the cognitive or contextual challenges students face (Myers, Hughes, Witzel, Anderson, & Owens, 2023). Collaborative and problem-based learning approaches promote engagement, yet their success is limited by inconsistent facilitation, unequal participation, and lack of structured guidance (Falguera, 2022; Ganiyu, 2023).

A recurring issue across these strategies is the neglect of comprehension. Many students find it hard to decode the language of word problems, especially in a foreign instructional language. Teacher-centered approaches dominate, and emphasized rote learning rather than interactive engagement or cultural inclusivity (Park, 2024). This often alienates learners whose linguistic and cultural backgrounds are overlooked, limiting both participation and achievement (Casiano & Torres, 2023).

The use of students' mother tongue as a medium of instruction has emerged as a promising solution. Studies have shown that learning Mathematics in a familiar language improves comprehension, helps students in relating to abstract concepts, and enhances overall academic performance (Moleko, 2021; Casiano & Torres, 2023). Language plays a central role in interpreting and solving word problems, and using a language that students

understand helps eliminate this barrier, thereby enabling them to focus on the problem's conceptual and numerical demands (Mendecka, 2023).

Mother tongue instructional strategy fosters inclusivity and active participation, particularly in multilingual environments. Students feel more confident, ask more questions, and engage more deeply with mathematical concepts when taught in their native language (Casiano & Torres, 2023). However, challenges remain, including limited instructional resources in local languages and a shortage of qualified bilingual teachers. Still, the growing research base supports its broader adoption (Moleko, 2021; Acharya, 2024).

In Nigeria, where linguistic diversity intersects with educational inequities, the language of instruction is a significant obstacle, especially in rural areas. Students frequently struggle with problem statements written in English, which is often not their first language. This creates a disconnect between classroom instruction and everyday understanding (Acharya, 2024).

Using students' home language not only promotes academic performance but also strengthens their identity and cultural pride. Research underscores that bilingualism enriches cognitive abilities, aids additional language acquisition, and fosters deeper learning (Mtshali & Mashiya, 2022; Pandey, 2023). Instructions in the mother tongue support smooth transitions to second languages, allowing students to build on what they already know rather than starting from scratch.

Countries that begin early education in home languages such as Kenya, report improved comprehension and stronger cultural connection among students. Learner-centered approaches become more feasible, and students are empowered to express themselves more openly. This not only improves numeracy and literacy but also enhances knowledge retention (Mendecka, 2023).

Integrating mother tongue instructional strategy with digital tools also holds promise. Technology can provide multilingual, personalized learning resources that accommodate diverse learners' needs (Casiano & Torres, 2023; Pandey, 2023). Aligning instructional strategies with students' linguistic and cultural backgrounds is therefore vital for improving academic outcomes in mathematics, especially in word problems.

Despite ongoing interventions to boost performance in mathematics, the specific impact of mother tongue instruction on students' achievement in solving mathematics word problems remains underexplored. This study therefore bridged this gap by investigating the effects of mother tongue instructional strategy on students' academic performance in Mathematics Word problems in Oyo South Senatorial District, Nigeria.

Statement of the Problem

Despite various educational reforms, students in Nigeria continue to perform poorly in Mathematics word problems. This persistent challenge stems from a combination of factors, including ineffective instructional methods, language barriers, and a limited focus on developing critical thinking skills. In many classrooms, English remains the primary language of instruction, even in regions where students' mother tongues are more dominant. This language gap often creates a disconnect between teachers and learners, limiting students' understanding and active participation. Furthermore, the continued reliance on conventional, teacher-centered approaches coupled with the lack of culturally responsive teaching fails to meet the diverse learning needs of students. As a result, many students develop negative attitudes towards mathematics, along with low confidence in their ability to solve word problems effectively. Although several studies have attempted to address students' poor Mathematics performance through various instructional strategies, there remains a significant gap in exploring how the use of mother-tongue as a language of instruction might influence students' achievement in Mathematics word problems, especially at the senior secondary school level in linguistically diverse areas such as Oyo South Senatorial District, Nigeria. Most existing research continues to focus on English-only instructions, often neglecting the potential benefits of using indigenous languages as a cognitive and instructional tool in Mathematics learning. In view of this, the present study aims to investigate the effect of Mother-Tongue Instructional Strategy on Academic Achievement of Senior Secondary School Students in Mathematics Word Problems in Oyo South Senatorial District, Nigeria. It sought to determine whether teaching Mathematics using students' native languages can significantly enhanced their comprehension, engagement, and overall performance in solving word problems.

Purpose of the Study

This study investigated the Effect of Mother-tongue Instructional Strategy on Senior Secondary School Students' Academic Achievement in Mathematics Word-problems in Oyo South Senatorial District, Nigeria.

Specifically, the study determined the effect of Mother-tongue Instructional Strategy on Senior Secondary School Students Academic Achievement in Mathematics Word-problems in Oyo South Senatorial District, Nigeria.

Hypothesis

The null hypothesis below was tested at the 0.05 level of significance:

H_0: There is no significant effect of Mother-tongue Instructional Strategy on Senior Secondary School Students Academic Achievement in Mathematics Word-problems in Oyo South Senatorial District, Nigeria.

METHODOLOGY

This study employed a quasi-experimental research design incorporating both pre-test and post-test procedures. The design consisted of two groups: the experimental group and the control group. Students in the experimental group were exposed to instruction using the mother tongue, while those in the control group received conventional teaching through the traditional English-based method. A total of 140 Senior Secondary School II (SS II) students participated in the study, with 70 students in each group. The sampling process followed a multistage approach involving three key stages. First, the nine Local Government Areas (LGAs) within Oyo South Senatorial District were grouped into two unequal strata based on specific educational and geographical considerations. At the second stage, one LGA was purposively selected from each stratum. The third stage involved the random selection of one public senior secondary school from each of the two selected LGAs. To ensure fairness and equal opportunity, the selection of schools for the study was done randomly. The school chosen from Stratum 1 was tagged Group A and was assigned to the experimental group and received Mathematics instructions using the mother tongue, while the school chosen from stratum 2 was tagged group B and served as the control group taught with the traditional method of instruction, which is the English Language. The instrument used for data collection was the Mathematics Word Problems Achievement Test (MWPAT) which consisted of 30 multiple choice questions with four options. The test was designed to assess students' ability to solve Mathematics word problems effectively. To ensure the quality and suitability of the instrument, it was subjected to face, content, and construct validation through expert review and recommendations. In determining the reliability of the test, a pilot study was conducted using a different group of students with similar characteristics to those students in the main study. The test yielded a high reliability coefficient of 0.89, calculated using the Kuder-Richardson Formula 20 (KR-20), indicating that the instrument was consistent and dependable. Data collected from the study were analyzed using Analysis of Covariance (ANCOVA), and the hypothesis was tested at the 0.05 level of significance.

RESULT

H_0: There is no significant effect of Mother-tongue instructional strategy on Senior Secondary School Students Academic Achievement in Mathematics Word-problems in Oyo South Senatorial District, Nigeria.

Table 1: Tests of Between-Subjects Effects of Mother-tongue Instructional Strategy on Senior Secondary School Students' Academic Achievement in Mathematics Word-problems in Oyo South Senatorial District, Nigeria

Dependent Variable: Posttest

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	760.746[a]	2	380.373	14.252	0.000	0.172

Intercept	3887.819	1	3887.819	145.668	0.000	0.515
Pretest	33.882	1	33.882	1.269	0.262	0.009
Strategy	718.036	1	718.036	26.903	0.000	0.164
Error	3656.475	137	26.690			
Total	36611.000	140				
Corrected Total	4417.221	139				
a. R Squared = 0.172 (Adjusted R Squared = 0.160)						

Source: Researchers' Fieldwork, 2025

Table 1 presented the result of ANCOVA on the effect of mother-tongue instructional strategy on senior secondary school students' academic achievement in Mathematics word-problems in Oyo South Senatorial District, Nigeria. The result from table 1 showed that, $F_{(1;\ 137)} = 26.903$ and $p < 0.05$. This indicated that the null hypothesis (H_0) that mother-tongue instructional strategy has no significant effect on senior secondary school students' academic achievement in Mathematics word-problems in Oyo South Senatorial District, Nigeria and was rejected since $p < 0.05$. Hence, there was significant effect of mother-tongue instructional strategy on Senior Secondary School Students Academic Achievement in Mathematics Word-problems in Oyo South Senatorial District, Nigeria. The Partial Eta Squared value in the Table 1 indicated the effect of mother-tongue instructional strategy and traditional teaching strategy. This value was 0.164; this suggested that about 16.4% of the variance in the posttest score of the senior secondary school students' academic achievement in Mathematics word-problems in Oyo South Senatorial District was explained by mother-tongue instructional strategy.

Table 2: Parameter Estimates of Mother-tongue Instructional Strategy on Senior Secondary School Students' Academic Achievement in Mathematics Word-problems in Oyo South Senatorial District

Dependent Variable: Posttest

Parameter	**B**	**Std. Error**	**t**	**Sig.**	**95% Confidence Interval**		**Partial Eta Squared**
					Lower Bound	**Upper Bound**	
Intercept	11.692	1.226	9.536	0.000	9.268	14.117	0.399
Pretest	0.114	0.102	1.127	0.262	-0.086	0.315	0.009
[Strategy=MOTHER TONGUE]	4.531	0.874	5.187	0.000	2.804	6.258	0.164
[Strategy=TRADITIONAL TEACHING]	0.000[a]	0.000	0.000	0.000	0.000	0.000	0.000
a. This parameter is set to zero because it is redundant.							

Source: Researchers' Fieldwork, 2025

Table 2 showed the coefficients of the parameters included in the analysis, where, Mother-tongue instructional strategy had a positive and significant effect on the senior secondary school students' academic achievement in Mathematics word-problems in Oyo South Senatorial District. Since the coefficient of the mother-tongue instructional strategy was 4.531 and was statistically significant at 5% level. The result signified that a unit increase in mother-tongue instruction increased the senior secondary school students' academic achievement in Mathematics word-problems in Oyo South Senatorial District by 4.531 unit. The outcome implied that mother-tongue instructional strategy substantially contributed to senior secondary school students' academic

achievement in Mathematics word-problems in Oyo South Senatorial District, Nigeria.

Table 3: Pairwise Comparisons of Mother-tongue Instructional Strategy and Traditional Teaching Method on Senior Secondary School Students' Academic Achievement in Mathematics Word-problems in Oyo South Senatorial District

Dependent Variable: Posttest

(I) Strategy	(J) Strategy	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
MOTHER TONGUE	TRADITIONAL TEACHING	4.531*	0.874	0.000	2.804	6.258
TRADITIONAL TEACHING	MOTHER TONGUE	-4.531*	0.874	0.000	-6.258	-2.804

Based on estimated marginal means

*. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Source: Researchers' Fieldwork, 2025

Table 3 presented the results of the post hoc tests (that is, pairwise comparisons) that were carried out to see which groups differ. The tests showed that there was significant difference between mother-tongue instructional strategy and traditional teaching strategy ($p < 0.05$).

Table 4.2.4: Estimates of Mother-tongue Instructional Strategy and Traditional Teaching Strategy on Senior Secondary School Students' Academic Achievement in Mathematics Word-problems in Oyo South Senatorial District, Nigeria

Dependent Variable: Posttest

Strategy	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
MOTHER TONGUE	17.430[a]	0.618	16.209	18.651
TRADITIONAL TEACHING	12.899[a]	0.618	11.678	14.120

a. Covariates appearing in the model are evaluated at the following values: Pretest = 10.54.

Source: Researchers' Fieldwork, 2025

Table 4 showcased the results of the estimated marginal mean, which gave the adjusted means (controlling for the covariate 'pretest score') for each strategy group. This simply means that the effect of 'pretest score' has been statistically removed. The outcomes of the estimated marginal means showed that higher academic performance was recorded in Mathematics word-problems for the senior secondary school students in Oyo South Senatorial District with mother-tongue instructional strategy (mean = 17.430 unit) on average after adjusting for pretest score, compared to the traditional teaching strategy (mean = 12.899 unit).

DISCUSSION OF FINDINGS

The study revealed a significant effect of mother-tongue instructional strategy on the academic achievement of Senior Secondary School students in Mathematics word problems in Oyo South Senatorial District. This indicates that students who were taught using their indigenous language performed better than those instructed

solely in English Language. The result indicated that learning in a familiar language enhances comprehension and critical reasoning skills that are essential for solving Mathematics word problems.

This finding is in line with a study conducted in Anambra State, where primary school pupils taught Mathematics in the Igbo language scored significantly higher than those taught in English (Okigbo & Okeke, 2021). The study underscored the effectiveness of indigenous languages in promoting better understanding of mathematical concepts and recommended integrating local languages into the school curriculum.

Similarly, a study by Yakusak and Yusuf (2022) on junior secondary school students revealed that those who received Mathematics instructions supplemented with their mother tongue outperformed peers who were taught exclusively in English. This affirms the current study's findings and emphasizes the role of the mother tongue in clarifying abstract mathematical concepts, enhancing student retention, and improving overall academic achievement.

Further supporting this perspective, a study on translanguaging practices in Swedish Mathematics classrooms observed that students often reverted to their native languages during informal discussions to process and solve problems, even when it was not officially encouraged (Engmark, Norén & Öystilä, 2024). This illustrates how students instinctively rely on their first language as a cognitive tool, reinforcing the positive impact of mother-tongue instruction highlighted in this study.

In another context, research conducted in the Philippines compared the use of English and Filipino as assessment languages. While no significant difference in performance was found, the study emphasized the benefits of bilingual instructional strategy and recommended including native language translations in assessments to support learners who are still acquiring proficiency in a second language (Cacho, Lladonez, Villenes, Macabuhay & Valerio, 2024). This indirectly supports the current findings by illustrating how mother-tongue use can scaffold learning in multilingual environments.

Moreover, a study focused on Grade 1 pupils learning Mathematics through mother-tongue instructional strategy found significant improvement in their performance. This success was attributed to localized and student-friendly teaching strategies that made abstract concepts more relatable and easier to grasp (Falguera, 2022). Although the study involved younger learners, it reinforces the broader principle that learning in one's native language enhances understanding which is a principle that remains valid across educational levels, including among senior secondary students as shown in the present study.

The findings from this study and those cited above collectively demonstrate that mother-tongue instructional strategy is not just a linguistic choice but a powerful pedagogical tool that significantly enhances students' ability to engage with and succeed in Mathematics word problems.

CONCLUSION

Based on the findings, the study concludes that mother-tongue instructional strategy significantly enhanced senior secondary school students' academic achievement in Mathematics word-problems in Oyo South Senatorial District, Nigeria. This suggests that innovative language strategies of instruction are critical for improving Mathematics outcomes.

RECOMMENDATIONS

Based on the findings of this study, it was recommended that, Schools should integrate mother-tongue instructional strategies, especially in early stages of problem-solving, to improve understanding and performance in Mathematics word-problems.

REFERENCES

1. Acharya, R. (2024). Role of Language in Mathematics Education. Education Science & Technology, 1(1), 1-11

2. Baysal, E. & Sevinc, S. (2022). The Role of the Singapore Bar Model in Reducing Students' Errors on Algebra Word Problems. International Journal of Mathematical Education in Science and Technology, 53(2), 289-310
3. Cacho, R., Lladonez, S. A., Villenes, R., Macabuhay, M. R. & Valerio, C. N. (2024). Influence of English and Filipino as Assessment Languages in Word-Problem Performance. OKARA: Journal Bahasa dan Sastra, 18(1), 54-70. https://doi.org/10.19105/ojbs.v18i1.12715
4. Casiano, K. & Torres, J. (2023). Language Attitudes and Beliefs toward Mother Tongue (MT) as a Medium of Instruction (MOI) in Mathematics: An Exploration among Preservice Teachers. Journal of Education and Language Studies, 1(1), 50-64.
5. Daróczy, G. (2023). Linguistic and Arithmetic Factors in Word Problems (Doctoral dissertation, Universität Tübingen).
6. Engmark, M., Norén, E. & Öystilä, C. (2024). An Imagined Situation-: Trans-languaging when Solving Mathematical Word Problems. In CIEAEM-Mathematics and practices: Actions for futures, 13, 437-446.
7. Falguera, R. A. (2022). Effectiveness of Mother Tongue-Based Instruction on Grade 1 Pupil's Performance in Mathematics, International Journal of Advanced Multidisciplinary Studies, 2, 260-270.
8. Ganiyu, W. A. (2023). Group Investigation and Numbered-Heads-Together Learning Strategies, and Senior Secondary Students' Learning Outcomes in Mathematics Word Problems in Oyo North Senatorial District, Nigeria (Doctoral dissertation).
9. Gökçe, S. & Güner, P. (2021). Forty Years of Mathematics Education: 1980-2019. International Journal of Education in Mathematics, Science and Technology, 9(3), 514-539.
10. Mendecka, K. (2023). The Right to Mother Tongue Education for Indigenous Peoples. StudiaIuridica, (96), 208-231.
11. Moleko, M. M. (2021). Teachers' Perspectives on Addressing Linguistic Factors Affecting Visualisation of Mathematics Word Problems. Eurasia Journal of Mathematics, Science and Technology Education, 17(11), em2029.
12. Mtshali, Z. & Mashiya, N. (2022). Teaching English Home Language to Foundation Phase Learners from Diverse Backgrounds. South African Journal of Childhood Education, 12(1), 1027.
13. Munir, J., Faiza, M., Jamal, B., Daud, S. & Iqbal, K. (2023). The Impact of Socio-economic Status on Academic Achievement. Journal of Social Sciences Review, 3(2), 695-705.
14. Myers, J. A., Hughes, E. M., Witzel, B. S., Anderson, R. D. & Owens, J. (2023). A Meta-Analysis of Mathematical Interventions for Increasing the Word Problem Solving Performance of Upper Elementary and Secondary Students with Mathematics Difficulties. Journal of Research on Educational Effectiveness, 16(1), 1-35.
15. Okigbo, E. C. & Okeke, M. N. (2021). Effects of Igbo and English Media of Instruction on Primary School Pupils' Achievement in Mathematics in Anambra State. UNIZIK Journal of Educational Research and Policy Studies, 7, 295-308.
16. Pandey, A. R. (2023). Language, Mother-Tongue Education and Sustainable Development: Some Reflections on Gandhian Thought. Contemporary Education Dialogue, 20(1), 65-90.
17. Park, S. A. (2024). Mixed Method Study on Elementary Preservice Mathematics Teachers Culturally Responsive Teaching Self Efficacy in Teaching Culturally and Linguistically Diverse Students (Doctoral dissertation, University of Florida).
18. Purcar, A. M., Bocoș, M., Pop, A. L., Roman, A., Rad, D., Mara, D. & Triff, D. G. (2024). The Effect of Visual Reasoning on Arithmetic Word Problem Solving. Education Sciences, 14(3), 278.
19. Unson, J. C. (2021). Vocabulary and Identification of Information: Difficulties and Challenges in Word Problems Solving. International Journal of Scientific Research and Management, 9(08), 338-357.
20. Usmonov, M. (2024). General Concept of Mathematics and Its History. INDEXING, 1(1), 71-75.
21. Yakusak, N. S. & Yusuf, A. F. (2022). Effects of Language of Instruction on Junior Secondary Students' Performance in Mathematics. British Journal of Contemporary Education, 2(1), 54-63. DOI: 10.52589/BJCEB4XQL7JV
22. Zhu, H. (2023). Transforming Mathematics Education: Fostering Critical Thinkers. In 2023 International Conference on Applied Psychology and *Modern Education (ICAPME 2023),* 108-114. Atlantis Press.