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PROF. JOSEPHINE N. OKOLI

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EDITORIAL

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We are grateful to the contributors and hope that our readers will enjoy reading these contributions.

Prof. Josephine N. Okoli
Editor-in-Chief

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TEACHERS' PROFESSIONALISM AS DETERMINANTS OF THEIR UTILIZATION OF INSTRUCTIONAL MATERIALS IN TEACHING MATHEMATICS IN CALABAR METROPOLIS, NIGERIA

[1]Ekpenyong Effiong Ibok (Ph.D), [2]Raymond Ogbebe Ogar (Ph,D), [3]Mercy Tawo Bessong, [4]Inyang Inyang Nelson(Ph,D)
[1]ibokekpenyong@yahoo.com, [2]raymond20ogar@gmail.com,
[3]mercytawobessong@gmail.com, [4]inyangnelson123@gmail.com
[1]Department of Mathematics and Computer Science Education,
[2]Department of Special Education,
[3]Department of Business Education
[4]Department of Geography and Environmental Science
[1]Faculty of Science Education
[2]Faculty of Educational Foundation Studies
[3]Faculty of Vocational and Entrepreneurial Education
[4]Faculty of Environmental Science
[1-4]University of Calabar, Cross- Rivers State, Nigeria

Abstract

This study examined teachers' professionalism as determinants of their utilization of instructional materials in teaching Mathematics in Calabar Metropolis, Nigeria. Two hypotheses were formulated to direct the study. Ex-post facto research design was adopted for the study. A total sample of 69 Mathematics teachers from 24 public secondary schools in the study area via century approach . The instrument titled "Questionnaire titled "Teacher professionalism and utilization of instructional materials in teaching Mathematics" was used for data collection. The reliability estimate of the questionnaire was established through Cronbach Alpha reliability estimate method which ranged from .71 to.76. These estimates having met the criterion for stability, thus warranted the use of the instrument for the study. Simple Linear Regression was the statistical technique adopted to test the hypotheses at .05 level of significance. The result of the analysis revealed that teachers' Professionalism in terms of pedagogical and subject matter individually significantly predicts their Utilization of Instructional Materials in Teaching Mathematics in Calabar Metropolis, Nigeria. It was concluded that teacher utilization of instructional materials in teaching Mathematics depend on their pedagogical and subject matter. Based on these findings, it was recommended among others, that Ministry of Education with partner with school administrators should Implement regular professional development workshops and training sessions focused on enhancing teachers' subject matter knowledge and pedagogical skills.
Keywords: Teachers' Professionalism, Instructional Materials, Pedagogical professionalism

Introduction

Mathematics is difficult to teach and to learn because it consists of unfamiliar concepts involving complex relations. The highly conceptual nature of Mathematics makes it particularly difficult for students to understand. The strategies commonly used in the classroom have not sufficiently eased the learning process of the subject almost at all levels (Ibok, & Unoh, 2019). Rote learning contributes very little to the knowledge structure of the learner and therefore cannot promote reflective thinking in more critical and abstract manner. If students can see a clear and organized picture of a broad unit covering various concepts, building a deeper understanding and appreciation of these concepts become easier. The effective teaching of mathematics is influence by effective utilization of instructional materials. These materials include textbooks, digital resources, manipulatives, and visual aids, play a vital role in enhancing students' understanding of mathematical concepts and fostering engagement in the learning process (Akinola, 2022).

According to Akinola,(2022), utilization of instructional materials in teaching mathematics involves the selection, adaptation, and implementation of various resources (such as textbooks, digital tools, manipulatives, and visual aids) to enhance the learning experience. Effective utilization is crucial for facilitating understanding of mathematical concepts and engaging students in active learning. Instructional materials are the relevant materials utilized by a teacher during Mathematics instructional process to facilitate teaching and learning and for the purpose of making the contents of the instructions more practical and less vague. It therefore follows that such resources may be both human and non-human provided they facilitate the acquisition and evaluation of knowledge, skills, attitude morals and values (Ibok, & Ogar, 2024). Ordinary words or verbalization has been found to be inadequate for effective teaching. Instructional materials serve as a channel through which messages, information, ideas and knowledge are disseminated more easily. The can therefore be manipulated, seen, heard, felt or talked about. Instructional resources are anything or anybody the teacher turns to for help in his learning process (Akpa, Ekpenyong, & Emmanuel, 2024). The interactive nature of some of the materials makes the learner part of the learning process.

However, the use of instructional materials in the teaching and learning of Mathematics is not only the issue, but also the appropriateness of the selected materials by the teacher to the topic at hand, which sometimes make the lesson lose effectiveness, thereby

rendering the materials useless. These instructional materials are lacking in our secondary schools as a result, teachers take to chalk and talk as they have no visual or audiovisual materials which the students can see, touch, smell and hear in the process of teaching and learning.

The effective use of instructional materials can lead to improved student outcomes, as they provide concrete examples that help bridge the gap between abstract mathematical theories and practical application (Ogunyemi, 2020). However, many teachers face challenges in selecting and utilizing these resources effectively. Factors such as limited access to quality materials, inadequate training, and varying levels of professional development can significantly impact teachers' ability to implement instructional materials in their classrooms (Oyeniran, Ojo, & Adebayo, 2021). Moreover, the integration of technology in mathematics education has transformed the landscape of instructional materials. Digital tools and online resources offer new opportunities for interactive learning, yet not all teachers are equipped to leverage these technologies effectively (Bassey, Udo & Effiong, 2023). As educators strive to meet diverse student needs, understanding the barriers and facilitators to effective utilization of instructional materials based on teachers professionalism becomes essential. Teachers' professionalism plays a crucial role in shaping educational outcomes, particularly in the context of mathematics instruction. Teacher professionalism is the knowledge, skills, and practices that teachers must have in order to be effective educators. Teachers' professionalism refers to the set of values, behaviors, and practices that define a teacher's commitment to their profession. It encompasses the skills, knowledge, and ethical standards that educators uphold in their roles. Professionalism in teaching is characterized by a dedication to student learning, continuous professional development, and adherence to ethical practices that promote a positive educational environment. Professionalism encompasses a range of attributes, including knowledge, skills, ethical standards, and commitment to continuous improvement. These factors significantly influence how teachers utilize instructional materials, which are essential for effective teaching and learning in mathematics. The effective use of instructional materials not only enhances student engagement but also supports diverse learning styles and fosters a deeper understanding of mathematical concepts. Research has shown that professional development and the level of professionalism among teachers directly correlate with their ability to select and implement appropriate instructional resources (Ogunyemi, 2020; Oyeniran et al., 2021).

In recent years, there has been a growing emphasis on the need for teachers to adopt a professional stance towards their practice, which includes staying updated with current pedagogical strategies and utilizing a variety of instructional materials effectively (Akinola, 2022; Bassey et al., 2023). This introduction explores the relationship between teachers' professionalism and their utilization of instructional materials in mathematics teaching, highlighting how various facets of professionalism influence instructional practices. Teachers with a strong foundation in mathematics and pedagogical skills are more likely to select and use effective instructional materials. Their understanding of content and teaching strategies informs their choices, leading to improved student outcomes (Ogunyemi, 2020). Continuous professional development enables teachers to stay current with innovative teaching practices and resources. This commitment enhances their ability to utilize instructional materials effectively (Akinola, 2022). Professionalism involves ethical considerations and reflective practices that guide teachers in their decision-making regarding instructional materials. Reflective practitioners are better equipped to assess the effectiveness of the materials they use (Bassey et al., 2023). Despite the recognized importance of instructional materials in enhancing mathematics instruction, many teachers struggle to utilize these resources effectively. This challenge is often linked to varying levels of professionalism among educators, which encompasses their knowledge, skills, attitudes, and commitment to continuous improvement. The relationship between teachers' professionalism and their utilization of instructional materials remains underexplored, particularly in the context of mathematics education. Teachers with higher professionalism tend to employ a wider range of instructional materials and strategies, leading to improved student engagement and achievement (Akinola, 2022; Bassey et al., 2023). However, many mathematics teachers still rely on traditional teaching methods and limited resources, which may hinder student learning outcomes (Ogunyemi, 2020). Furthermore, the lack of consistent professional development opportunities and collaborative environments can exacerbate this issue, preventing teachers from enhancing their instructional practices (Oyeniran et al., 2021). As a result, there is a critical need to investigate how different dimensions of teachers' professionalism influence their selection and use of instructional materials in mathematics teaching.

Pedagogical professionalism refers to the competencies, skills, and ethical standards that educators possess, which influence their teaching practices and decision-making processes. In the context of mathematics education, pedagogical professionalism is a

critical determinant of how teachers utilize instructional materials. According to Kunter and Baumert (2019), pedagogical professionalism refers to the skills, knowledge, and ethical standards that educators possess, enabling them to effectively facilitate learning. It encompasses teachers' ability to apply educational theories and practices in the classroom, engage students, and adapt teaching strategies to meet diverse learning needs. Ogunyemi (2020) investigates the role of teachers' pedagogical professionalism in the utilization of instructional materials for teaching mathematics in Nigerian schools. The findings indicate that teachers with higher levels of pedagogical professionalism are more likely to select and employ a diverse range of instructional materials, leading to improved student engagement and understanding. The study emphasizes the need for ongoing professional development to enhance teachers' pedagogical skills. Oyeniran et al. (2021) examines the impact of collaborative practices among mathematics teachers on their pedagogical professionalism and the effective use of instructional materials. The study highlights that teachers who engage in collaborative professional development are better equipped to utilize instructional materials effectively, resulting in enhanced student learning outcomes. Akinola (2022) study focuses on the relationship between teachers' pedagogical professionalism and their instructional practices in mathematics. The results reveal that teachers who engage in continuous professional development show a significant increase in their utilization of instructional materials, which positively affects student performance in mathematics. The study suggests integrating pedagogical training into teacher education programs to foster professionalism. A study conducted by Bassey et al. (2023) to explores the connection between pedagogical professionalism and the effective use of instructional materials in mathematics teaching across various educational settings. The findings indicate that teachers with a strong sense of pedagogical professionalism are more adept at selecting and implementing instructional materials that cater to diverse learning needs, thereby improving overall student engagement and achievement. Gonzalez, Garcia and Lopez (2021) research investigates how teachers' beliefs about their professionalism influence their pedagogical choices in mathematics instruction. The study finds that teachers who perceive themselves as professionals are more likely to utilize a variety of instructional materials, thereby enhancing student learning experiences. The authors advocate for policies that support teacher self-efficacy and professionalism. The empirical evidence suggests a strong correlation between pedagogical professionalism and the utilization of instructional materials in teaching mathematics. Both local and foreign studies highlight the importance of ongoing professional development, collaborative practices,

and self-efficacy in enhancing teachers' professionalism, which in turn positively influences their instructional choices.

Subject matter professionalism refers to the depth of knowledge and expertise that teachers possess in their subject area, which significantly influences their instructional practices and the effectiveness of their teaching strategies. In mathematics education, subject matter professionalism is crucial for the effective utilization of instructional materials. Hill and Ball (2020) stated that subject matter professionalism refers to the depth of knowledge and expertise that teachers have in their specific subject areas. In mathematics education, it involves understanding mathematical concepts, processes, and applications, which enables teachers to effectively convey content and utilize instructional materials. Adeyemi (2021) investigates the impact of subject matter knowledge on the utilization of instructional materials among mathematics teachers in Nigerian secondary schools. The findings reveal that teachers with a strong grasp of mathematical concepts are more likely to select and utilize appropriate instructional materials, resulting in enhanced student comprehension and engagement. The study emphasizes the importance of content knowledge in shaping effective teaching practices. Ibrahim, Salau and Mohammed (2020) research explores the relationship between mathematics teachers' subject matter professionalism and their ability to integrate instructional materials in their teaching. The study finds that teachers with higher subject matter knowledge tend to employ a wider variety of instructional materials, which positively impacts students' learning outcomes. The authors advocate for targeted training programs to enhance teachers' subject matter expertise. Hill, Blunk, Charalambous and Lewis (2019) examine the role of subject matter professionalism in the effective use of instructional materials in mathematics education across various countries. The findings indicate that teachers with deep subject knowledge are more effective in selecting and using instructional materials that align with curriculum goals, leading to improved student performance. Miller, Smith and Johnson (2022) research investigates how teachers' subject matter professionalism influences their instructional choices in mathematics. The study finds that teachers with a robust understanding of mathematical concepts are more likely to utilize diverse and innovative instructional materials, thereby enhancing student engagement and learning outcomes. The authors recommend that teacher preparation programs place a stronger emphasis on subject matter knowledge. López, Garcia and Torres (2023) examines the relationship between subject matter professionalism and the pedagogical choices made by mathematics teachers in various educational settings. The results indicate that

teachers who possess a high level of subject matter knowledge are more confident in their ability to integrate instructional materials effectively, leading to improved educational outcomes for students. The authors call for ongoing professional development that focuses on deepening subject matter understanding. The empirical evidence highlights a significant correlation between subject matter professionalism and the utilization of instructional materials in teaching mathematics. Local and foreign studies underscore the importance of deep content knowledge in enabling teachers to select and implement effective instructional materials that enhance student learning. Addressing the gaps in subject matter professionalism through targeted training and professional development can lead to improved teaching practices and better educational outcomes in mathematics.

Statement of Problem

Teachers' inability to effectively use their professional skills posed serious problem in his/her daily utilization of instructional materials to deliver a lesson to the learners. Some secondary school teachers are not able to utilize instructional material in teaching to reflect students' life experiences in their environment due to poor pedagogical and subject matter. Most of their lessons always remain at the abstract level and involve meaningless manipulation of numbers, symbols and relation. Most students have difficulty in learning and understanding due to teachers inadequate utilization of instructional materials in teachings. This has resulted to students showing negative attitude, loss of interest and lack of attention in class during mathematics classes. Students learn more easily in what they see, feel and touch which better their understanding. Armed at this, the researcher examine teachers' professionalism as determinants of their utilization of instructional materials in teaching Mathematics in Calabar Metropolis, Nigeria.

Purpose of the Study

The purpose of this study is to examine teachers' professionalism as determinants of their utilization of instructional materials in teaching Mathematics in Calabar Metropolis, Nigeria. Specifically, the study seeks to examine ;

1. teachers' pedagogical professionalism as predicts their utilization of instructional materials in teaching Mathematics.

2. teachers' subject matter professionalism as predicts their utilization of instructional materials in teaching Mathematics

Research Questions

The following research questions were posed

1. To what extent does teachers' pedagogical professionalism predicts their utilization of instructional materials in teaching Mathematics?
2. To what extent does teachers' subject matter professionalism predicts their utilization of instructional materials in teaching Mathematics?

Hypotheses

Based on the specific objective and research question raised, the following null hypotheses was put forth to guide the study.

$H0_1$: Teachers' pedagogical professionalism does not significantly predicts their utilization of instructional materials in teaching Mathematics.

$H0_2$: Teachers' subject matter professionalism does not significantly predicts their utilization of instructional materials in teaching Mathematics

Methodology

The study area was Calabar Metropolis of Cross River State which consist of Calabar South and Calabar Municipality. The research design used for this study was the ex-post facto design. The researcher used this design because the independent variables which are teachers' pedagogical professionalism and subject matter professionalism were variables that have occurred already and the researcher had no direct control over them. The population for the study consisted of all 69 Mathematics teachers from 24 public secondary schools of which formed the sample of the study. The century approach was used since the population of the mathematics teachers was not too large for the researcher to use for the study.

One instrument was used titled "Teacher professionalism and utilization of instructional materials in teaching Mathematics for both teacher. The questionnaire consisted of one section developed based on the main variable such as pedagogical, subject matter and utilization of instructional materials in teaching Mathematics. The questionnaire was based on four point scale used in measuring responding opinion level of agreement or disagreement such as Strongly agree, Agree, disagree and Strongly

disagree. The instrument was face-validated by two experts in measurement and evaluation. Correction were pointed out by the expert and adjusted by the researchers and the document was considered valid. The reliability estimate of the questionnaire was established through Cronbach Alpha reliability estimate method which ranged from .71 to.76. The statistics package for social sciences (SPSS) computer programme was used to analyze the data collected. The data for the hypotheses were analyzed using Simple Linear regression for the hypothesis two.

Results

Research Question 1: To what extent does teachers' pedagogical professionalism predicts their utilization of instructional materials in teaching Mathematics.

Table 1: Co-efficient of determinant using the extent to which teachers' pedagogical professionalism predicts their utilization of instructional materials in teaching Mathematics

Variables	No. of item	Mean	SD	R-value	Decision
Pedagogical professionalism	6	17.4783	1.68565	.317	Lowly predicted
Utilization of instructional materials	10	31.9275	2.05311		

The result in Table 1 shows the extent to which teachers' pedagogical professionalism as its predicts utilization of instructional materials in teaching Mathematics in Calabar Metropolis, Nigeria with beta value of .317 which measures the effect size or the strength of teachers' pedagogical professionalism as its predicts utilization of instructional materials in teaching Mathematics. This implies that teachers' pedagogical professionalism contributed 31.1 % which is low predictors of utilization of instructional materials in teaching Mathematics in Calabar Metropolis, Nigeria.

Research Question 2: To what extent does teachers' subject matter professionalism predicts their utilization of instructional materials in teaching Mathematics

Table 2: Co-efficient of determinant using the extent to which teachers' subject matter professionalism predicts their utilization of instructional materials in teaching Mathematics

Variables	No. of item	Mean	SD	R-value	Decision
Teachers' subject matter professionalism	6	19.3188	1.49993	.308	Lowly predicted
Utilization of instructional materials	10	31.9275	2.05311		

Table 2 shows the extent to which teachers' subject matter professionalism as its predicts utilization of instructional materials in teaching Mathematics in Calabar Metropolis, Nigeria with beta value of .308 which measures the effect size or the strength teachers' subject matter professionalism as its predicts utilization of instructional materials in teaching Mathematics. This implies that teachers' pedagogical professionalism contributed 30. 8% which is low predictors of utilization of instructional materials in teaching Mathematics in Calabar Metropolis, Nigeria.

$H0_1$: Teachers' pedagogical professionalism does not significantly predicts their utilization of instructional materials in teaching Mathematics.

Table 3: Simple Regression Analysis of teachers' pedagogical professionalism as a predicts their utilization of instructional materials in teaching Mathematics

Model	R	R. square	Adjusted Square	R.	Std error of the estimate	
1	.317[a]	.101	.087		1.96168	
Model	Sum of square	Df	Mean square		F-value	p-value
Regression	28.809	1	28.809		7.486	.008[b]
Residual	257.828	67	3.848			
Total	286.638	68				

The result of simple regression analysis presented in Table 3 points at the correlation coefficient of the variable of .317 which implied that there is a strong relationship between teachers' pedagogical professionalism and utilization of instructional materials in teaching Mathematics in Calabar Metropolis . More so, the result as presented in Table 1 showed that Adj R^2 = .087 which implies that 8.7 % of teachers' pedagogical professionalism in the study area accounted for their utilization of instructional materials in teaching Mathematics . The result also shows that teachers' pedagogical professionalism significantly predicts their utilization of instructional materials in teaching Mathematics(F=7.486, p =008).. Hence the null hypothesis is rejected at 0.05 level of significance.

H0$_2$: Teachers' subject matter professionalism does not significantly predicts their utilization of instructional materials in teaching Mathematics.

Table 4: Simple Regression Analysis of teachers' subject matter professionalism as a predicts their utilization of instructional materials in teaching Mathematics

Model	**R**	**R. square**	**Adjusted Square**	**R.**	**Std error of the estimate**	
1	.308[a]	.095	.081		1.96812	
Model	Sum of square	Df	Mean square		F-value	p-value
Regression	27.114	1	27.114		7.000	.010[b]
Residual	259.523	67	3.873			
Total	286.638	68				

The result of simple regression analysis presented in Table 4 showed the correlation coefficient of the variable of .308 which implied that there is a strong relationship between teachers' subject matter professionalism and utilization of instructional materials in teaching Mathematics in Calabar Metropolis . More so, the result as presented in Table 1 showed that Adj R^2 = .081 which implies that 8.1 % of teachers' subject matter in the study area accounted for their utilization of instructional materials in teaching Mathematics . The result also show that teachers' subject

matter professionalism significantly predicts their utilization of instructional materials in teaching Mathematics(F=7.000, p =010).. Hence the null hypothesis is rejected at 0.05 level of significance.

Discussion

The result of the first hypothesis shows that teachers' pedagogical professionalism significantly predicts their utilization of instructional materials in teaching Mathematics in public secondary school in Calabar Metropolis, Nigeria. This is because teachers with strong pedagogical professionalism are skilled at adapting their teaching strategies to suit different learning styles. This adaptability allows them to utilize a range of instructional materials effectively, enhancing student engagement. Effective pedagogical practices include using diverse instructional materials to capture students' interest and facilitate active learning, leading to improved

According to Kunter and Baumert,(2019), pedagogical professionalism refers to the skills, knowledge, and ethical standards that educators possess, enabling them to effectively facilitate learning. This aligned with Ogunyemi (2020) who found that teachers with higher levels of pedagogical professionalism are more likely to select and employ a diverse range of instructional materials, leading to improved student engagement and understanding. The finding agreed with Oyeniran et al. (2021) who found that teachers who engage in collaborative professional development are better equipped to utilize instructional materials effectively, resulting in enhanced student learning outcomes. The finding aligned with Akinola (2022) who found that teachers who engage in continuous professional development show a significant increase in their utilization of instructional materials, which positively affects student performance in mathematics. Teachers' pedagogical plays a significant role in his/her ability to properly ultilize instructional materials to make learning process very interesting and memorable.

The result of the second hypothesis shows that teachers' subject matter professionalism significantly predicts their utilization of instructional materials in teaching Mathematics in public secondary school in Calabar Metropolis, Nigeria. This is because teachers with strong subject matter professionalism have a comprehensive understanding of mathematical concepts, which enables them to select appropriate instructional materials that align with curriculum goals and student needs. A solid grasp of the subject matter boosts teachers'. The finding agreed with Hill and

Ball (2020) who stated that subject matter professionalism refers to the depth of knowledge and expertise that teachers have in their specific subject areas. In mathematics education, it involves understanding mathematical concepts, processes, and applications, which enables teachers to effectively convey content and utilize instructional materials. The finding aligned with Adeyemi (2021) who found that teachers with a strong grasp of mathematical concepts are more likely to select and utilize appropriate instructional materials, resulting in enhanced student comprehension and engagement. The finding agreed with Ibrahim et al. (2020) who found that teachers with higher subject matter knowledge tend to employ a wider variety of instructional materials, which positively impacts students' learning outcomes. In line with this finding Hill et al. (2019) found that teachers with deep subject knowledge are more effective in selecting and using instructional materials that align with curriculum goals, leading to improved student performance. The finding aligned with Miller et al. (2022) who found that teachers with a robust understanding of mathematical concepts are more likely to utilize diverse and innovative instructional materials, thereby enhancing student engagement and learning outcomes. The finding aligned López et al. (2023) found that teachers who possess a high level of subject matter knowledge are more confident in their ability to integrate instructional materials effectively, leading to improved educational outcomes for students.

Conclusion

The finding of the study revealed that teachers' Professionalism (in terms of pedagogical and subject matter) significantly predicts their Utilization of Instructional Materials in Teaching Mathematics in Calabar Metropolis, Nigeria. Professionalism plays a significant role in shaping teaching practices. The findings indicate that teachers who exhibit high levels of professionalism—characterized by deep subject matter knowledge, effective pedagogical strategies, and a commitment to ongoing professional development—are more likely to utilize instructional materials effectively. This utilization not only enhances the learning experience for students but also significantly improves their understanding and performance in mathematics.

Recommendations

Based on the finding of the study, it was recommended that;

1. Ministry of Education with partner with school administrators should Implement regular professional development workshops and training sessions focused on enhancing teachers' subject matter knowledge and pedagogical skills. These programs should be tailored to address the specific needs of mathematics educators.
2. School administrators should encourage the formation of professional learning communities among teachers to facilitate collaboration, sharing of best practices, and peer support. This can lead to improved utilization of instructional materials and enhanced teaching effectiveness.
3. Ministry of Education with partner with school administrators should ensure that teachers have access to a diverse range of instructional materials, including digital resources, manipulatives, and textbooks. Educational authorities should invest in providing these materials to schools, particularly in underserved areas.
4. Ministry of Education with partner with school administrators should advocate for educational policies that prioritize teacher professionalism and the effective use of instructional materials in mathematics education. Policymakers should recognize the importance of investing in teacher training and resource provision.

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