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Research Article

Relationship Between Teacher-Students Ratio, Teachers Effective Communication and Students' Academic Performance in Post-Basic Schools in Adamawa State, Nigeria

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Abstract

This research aims to investigate the connection between the Teacher-Student Ratio and the effectiveness of teachers' communication, as well as students' academic performance in Post-Basic Schools located in Adamawa State, Nigeria. To facilitate the study, two research questions and two hypotheses were formulated. The research design employed for this investigation is a correlational survey research design. The geographical focus of the study is Adamawa State, Nigeria. The study's population consists of 391 principals from five educational zones, encompassing 391 Post-Basic Schools and 38,499 Senior Secondary School II students in the public senior secondary schools across these zones. The selected sample for this research comprises 848 individuals, including 78 Post-Basic School principals and 770 students, representing 20% of the principals and 2% of the students, respectively. Various sampling techniques were utilized in this study, including simple random sampling, purposive sampling, and proportionate stratified random sampling. Data collection was conducted using two instruments: a self-structured questionnaire and a proforma designed to gather Senior Secondary School II Students' Termly Performance in English Language and Mathematics, referred to as the "Students' Academic Performance Rating Scale" (SAPRS). The data analysis involved both descriptive and inferential statistics. Specifically, descriptive statistics, including Mean and Standard Deviation, were employed to address the five research questions posed in the study, while Simple Linear Regression Analysis was utilized to test the null hypotheses at a significance level of 0.05. In summary, this research offers significant insights into the factors that affect students' academic performance in post-basic schools within Adamawa State. The findings emphasize the, communication skills, teaching experience, and students-teacher ratio in shaping students' academic outcomes. The results highlight the need for educational stakeholders to prioritize and enhance these aspects to create an environment conducive to optimal learning outcomes in post-basic schools. The results suggest that teachers who can, communicate effectively, are more likely to positively impact students' academic performance. Furthermore, the study highlights the importance of maintaining an appropriate teacher-student ratio in post-basic schools in Adamawa State. Based on the findings of the study, the following recommendations were made: Federal and state government should advocate for and invest in policies that aim to reduce the teacher-student ratio in post-basic schools in Adamawa State. This could involve hiring more teachers, creating smaller classes, or implementing innovative teaching methods to accommodate larger class sizes more effectively.

Keywords: *Relationship, Teacher-Students Ratio and Teachers Effective Communication and Students' Academic Performance.*

Introduction

Academic performance denotes the success of students in achieving either short-term or long-term educational objectives, or an individual's strong performance in a specific academic field (Usman, 2015). For instance, a student who receives high grades or an award in science has excelled in that academic discipline. Furthermore, academic performance represents the results of education; it reflects the degree to which a student, teacher, or school has met their educational targets. As noted by Spinath (2012), academic performance is frequently assessed through examinations or continuous evaluations. Jaeger (2013) states that secondary school students aspiring to advance to tertiary education often lack the necessary knowledge, skills, and mindset required for success.

Research indicates a significant correlation between teacher behavior and student academic achievement (Rashid & Zaman, 2018). Muema, Mulwa, and Mailu (2018) contended that the poor academic performance observed in many students is primarily linked to ineffective teaching methods employed by educators, suggesting that diverse teaching strategies should be implemented to effectively convey knowledge to learners.

The student-teacher ratio is calculated by dividing the total number of students enrolled in a school or university by the number of teachers present in that institution. Idowu and Oluwole (2014) argued that smaller class sizes are advantageous for all students due to the personalized attention they receive from teachers, with low-achieving students benefiting even more at the secondary school level. In larger classes, students may become distracted due to excessive instruction directed at the entire group rather than individualized attention, which particularly impacts low-achieving students. Research shows that students who are in smaller classes during their early grades tend to perform better in later grades. The advantages of smaller class sizes help to narrow the achievement gap in reading and science in subsequent grades (Ugo & Akpoghol, 2016). The advantages of smaller class sizes help to narrow the achievement gap in reading and science in higher grades. Similarly, Akpofure and N'dipu (2000) emphasized the importance of schools maintaining a manageable capacity for the effective use of classrooms, libraries, and laboratories to enhance teaching and learning. They believe this will lead to improved quality assurance in educational institutions.

Effective communication skills among teachers are essential for the academic success of students and their professional achievements in life. Teachers primarily deliver instructions verbally in the classroom. Inadequate communication skills in teachers can hinder students' learning and academic progress. It is crucial for students to discern right from wrong, which largely depends on the communication methods employed by teachers in the classroom (Alangir, Salahudeen, Syed & Manzoor, 2017). Strong communication skills can reduce the likelihood of negative feelings during the teaching process. For effective learning, students must remain attentive to their teachers during lectures. Good and effective communication enables well-trained teachers to foster positive relationships with their students (Asrar, Noman & Hira, 2018).

Academic performance is a primary concern within the educational field. Regrettably, the current state of education in developing countries, particularly Nigeria, undermines confidence in the system. This is evident from the declining academic performance among students. The alarming trend of decreasing academic performance in Post-Basic Schools, especially in Nigeria and specifically in Adamawa State, has sparked significant concern among stakeholders in the education sector (Obiakor & Oguejioffor, 2020). It is in line with the above that this study is designed to examine the relationship between Teacher-Students Ration and Teachers effective communication and students' academic performance in Post-Basic Schools in Adamawa State, Nigeria.

Purpose of the study

The purpose of this study is to investigate the relationship between Teacher-Students Ratio, Teachers effective communication and students' academic performance in Post-Basic Schools in Adamawa State, Nigeria. Specifically, the study sought to determine the relationship between:

1. Teachers–students' ratio and students' academic performance in post-basic schools in Adamawa State.
2. Teachers' effective communication and students' academic performance in post-basic schools in Adamawa State.

Research Questions

The following research questions were posed to guide the study;

1. What is the level of teachers–students' ratio in post-basic schools in Adamawa State?
2. What is the level of teachers' effective communication in post-basic schools in Adamawa State?

Research Hypotheses

The following null hypotheses were formulated to guide the study and was tested at 0.05 level of significance:

HO_1: There is no significant relationship between teachers –students' ratio and students' academic performance in post-basic schools in Adamawa State.

HO₂: There is no significant relationship between teachers' effective communication and students' academic performance in post-basic schools in Adamawa State.

LITERATURE REVIEW
Students' Academic Performance
As stated by Goshi (2020), academic performance encompasses the knowledge acquired, which is evaluated through marks given by educators and/or the educational objectives established by both students and teachers to be accomplished within a designated timeframe. Amie-Ogan and Omunakwe (2020) further noted that academic achievement results from the processes of teaching and learning. Students' academic performance pertains to the knowledge and skills that learners have successfully acquired in a particular subject or course, as well as the degree to which they have reached their short- or long-term educational objectives (Bell, 2013). Kimani, Kara, and Njagi (2013) emphasized the necessity of enhancing academic performance to fulfill the required educational standards, thereby equipping individuals with the skills, values, and knowledge essential for transforming their communities. For instance, many higher education institutions now utilize the Grade Point Average (GPA) as a practical summary metric to assess the academic performance of their students (Thornberry, 2000, cited in Oyeshiku, 2019).

Teachers Effective Communication and Students' Academic Performance
Effective communication within a school involves principals guiding teachers to understand an idea or concept as intended by the principals (Ugorji & Kagbaranen, 2022). Teachers who communicate effectively simplify concepts and enhance understanding (Bee, 2012). Strong communication skills are essential for teachers in delivering education, managing classrooms, and engaging with students. A teacher must cater to students with diverse thinking styles. To teach effectively according to the students' abilities and potential, a teacher must develop communication skills that inspire students in their learning journey (Bee, 2012).

In a similar vein, Marzano and Marzano (2019) suggested that communication is a fundamental aspect of classroom management. Ahmad (2018) stated that communication in the classroom involves the exchange of messages that allows teachers and students to share knowledge, attitudes, and skills. This is a crucial element of effective classroom management. The manner in which a teacher communicates during teaching and learning significantly affects the performance of both the teacher and the students. Oliver and Peschly (2017) asserted that teachers wield considerable influence in the classroom through their communication, shaping classroom dynamics.

Teachers –Students' Ratio and Students' Academic Performance
The student-teacher ratio indicates the workload of teachers and their availability to provide services and support to students (Daso, 2013). The student-teacher ratio is calculated by dividing the total number of students attending a school by the number of teachers employed at that institution. For instance, a ratio of 10:1 signifies that there are ten students for each teacher. This term can also be inverted to form a teacher-student ratio. As noted by Akinsolu (2010) and referenced by Bello, Abdullahi, Ahmad, & Samson (2021), teachers find it easier to assess, instruct, and receive positive feedback when class sizes are smaller and the number of students is limited. Many experts believe that a lower student-teacher ratio yields better outcomes compared to a higher ratio. In several instances, a higher student-teacher ratio can lead to improved scores. Overall, the student-teacher ratio is crucial in enhancing the quality of education.

The actual class size may often exceed the pupil-teacher ratio due to factors such as absenteeism and the specialization of teachers. Bello et al. (2021) assert that class size and student-teacher ratio significantly influence the quality of education and the academic success of students. It is clear that the pupil-teacher ratio and per-student expenditures are vital resource inputs for any educational institution. A lower ratio of students to teachers in a classroom increases the likelihood of enhancing educational quality and achieving the academic objectives of institutions. The quality of education is essential for the strategic planning of academic goals and keeping pace with the developed world. Nevertheless, the pressing question remains whether the student-teacher ratio affects the quality of education.

Taft, Perkowski, and Martin (2011) discovered a significant and robust correlation between class size, student-teacher ratios, and student achievement. They also noted that students performed better in smaller classes. Furthermore, they indicated that the most substantial advantage of decreasing class size was observed when the number of students in a class fell below 20. In conclusion, they asserted that smaller classes excelled in terms of student engagement, teacher morale, and the overall quality of the instructional environment.

METHODOLOGY
The research design utilized in this study is a correlational survey research design. As stated by Narejo (2005), this type of research design focuses on gathering data to assess the relationship between two or more measurable variables. This study investigates the connection between the Teacher-Students Ratio, effective communication by teachers, and the academic performance of students in Post-Basic Schools located in Adamawa State, Nigeria.

The geographical focus of this study is Adamawa State, Nigeria. Situated in the North-Eastern region of Nigeria, Adamawa State covers an area of approximately 36,917 square kilometers, with coordinates of about 9.3250N and 12.4381E, and Yola serving as its capital. Established on August 27, 1991, Adamawa State is one of nine states formed from the former Gongola State, with Yola as its capital. During the era of provincial administration in Nigeria, much of the land now known as Adamawa State was part of Adamawa Province, with Yola as its administrative center. This area is deemed appropriate for the study due to widespread concerns and allegations regarding a population surge in post-basic schools, as well as the perceived inadequacy of some classroom teachers in essential pedagogical skills, particularly in effective communication, which is crucial for students' academic success in Post-Basic Schools in Adamawa State.

The study's population comprises 391 principals from five educational zones, encompassing 391 Post-Basic Schools and 38,499 SSS II students in public senior secondary schools across these zones: Mubi zone with 9,524 students, Gombi zone with 6,224 students, Yola zone with 10,538 students, Numan zone with 7,083 students, and Ganye zone with 5,130 students (Adamawa State Post Primary Schools Management Board, 2023).

The total sample size consisted of 848 participants. This included 78 principals from Post Basic Schools and 770 students, representing 20% of the principals and 2% of the students, respectively. This sample size aligns with the findings of Singh and Masuku (2012), who state that when dealing with a large population in the thousands, the maximum percentage to be sampled should not exceed 5%, provided the sample size does not surpass 1000. For populations in the hundreds, a sampling percentage of 10% is recommended, while for smaller populations in the hundreds, at least 20% should be sampled. A multi-stage sampling procedure was employed for this study. The sampling techniques utilized included simple random sampling, purposive sampling, and proportionate stratified random sampling. Two instruments were utilized for data collection.

The tools employed in this study were a self-structured questionnaire and a proforma designed to gather the Termly Performance of Senior Secondary School II Students in English Language and Mathematics, referred to as the "Students' Academic Performance Rating Scale" (SAPRS).

Data analysis involved both descriptive and inferential statistics. Specifically, descriptive statistics such as Mean and Standard Deviation were applied to address the five research questions posed in the study. To answer these questions, a criterion means of 3.50 (with an upper limit of 3.00) was established, whereby items with mean values ranging from 3.50 to 5.0 were classified as High Level (HL), and those with mean values falling between 0.00 and 3.44 were categorized as Low Level (LL). Simple Linear Regression Analysis was employed to test null hypotheses 1-5 at a significance level of 0.05. In contrast, Multiple Regression Analysis was utilized to evaluate null hypothesis 6 at the same significance level. The decision rule states that if the p-value is lower than the significance level ($\alpha = 0.05$), the null hypothesis will be rejected.

RESULTS AND DISCUSSION

Research Questions 1 What is the level of teachers–students' ratio in post-basic schools in Adamawa State?

Table 1: Frequency and Percentages of Teachers – Students' Ratio in Post-Basic Schools in Adamawa State

Teacher-students Ratio	Frequency	Percentage (%)
1:80	24	30.8
1:70	37	47.4
1:60	10	12.8
1:50	5	6.4
1:40	2	2.6
Total	78	100.0

The findings shown in Table 1 offer a detailed summary of the teacher-student ratios in post-basic schools located in Adamawa State. The information indicates that most schools in the region have a teacher-student ratio between 1:70 and 1:80, with 47.4% of the schools reporting a ratio of 1:70 and 30.8% at 1:80. This implies that a considerable number of schools in the state have a relatively high student count per teacher. Conversely, a smaller fraction of schools maintains lower teacher-student ratios. For example, 12.8% of the schools uphold a ratio of 1:60, 6.4% have a ratio of 1:50, and merely 2.6% of the school's function with a ratio of 1:40. These findings suggest that only a few schools in Adamawa State enjoy a more advantageous teacher-student ratio, which may facilitate greater personalized attention and interaction between educators and learners. The aggregated data for all ratios underscores the varied distribution of teacher-student ratios in the surveyed post-basic schools, with the majority experiencing a higher student-to-teacher ratio. The differences in ratios among schools could affect the quality of education, as a lower ratio typically enables improved individualized instruction and support.

Research Questions 2: What is the level of teachers' effective communication in post-basic schools in Adamawa State?

Table 2: Mean and Standard Deviation of Level of Teachers' Effective Communication in Post-Basic Schools in Adamawa State

S/N	Item (n = 848)	Mean	S. D	Remark
1	Level at which teachers' non-verbal communication enhances our classroom participation	3.82	1.44	HL
2	Level at which teachers' visual communication skills improves our academic performance	3.92	1.10	HL
3	Signals given out through body language by my teachers positively influence our academic performance	3.04	1.45	ML
4	Level at which teacher's ability to ask open ended questions encourage the development of new ideas among students	4.06	1.44	HL
5	Level at which teachers active listening skills helps to correct misunderstanding	3.15	1.57	ML
	Grand Mean	**3.60**	**1.40**	**HL**

The findings from the analysis regarding the effectiveness of teachers' communication in post-basic schools in Adamawa State, as shown in Table 2, offer important insights into different facets of communication within the educational environment. The mean scores along with standard deviations are employed to assess the effectiveness of teachers' communication abilities. In summary, the overall grand mean is 3.60 with a standard deviation of 1.40, suggesting a relatively high level of effective communication among educators.

Examining the individual items, item 1 shows that teachers' non-verbal communication significantly boosts classroom participation, achieving a mean score of 3.82 and a standard deviation of 1.44, which classifies it as highly effective (HL). Likewise, item 2 reveals that teachers' visual communication skills have a positive effect on academic performance, with a mean score of 3.92 and a standard deviation of 1.10, also categorized as highly effective (HL). On the other hand, item 3 indicates that the signals communicated through teachers' body language have a moderate effect on academic performance, as reflected by a mean score of 3.04 and a standard deviation of 1.45, placing it in the moderately low (ML) category. Item 4 highlights that teachers' capability to pose open-ended questions fosters the generation of new ideas among students, with a mean score of 4.06 and a standard deviation of 1.44, denoting high effectiveness (HL). Finally, item 5 suggests that teachers' active listening skills are instrumental in rectifying misunderstandings, with a mean score of 3.15 and a standard deviation of 1.57, categorizing it in the moderately low (ML) range.

TESTING OF HYPOTHESES

HO$_1$: There is no significant relationship between teachers –students' ratio and students' academic performance in post-basic schools in Adamawa State.

Table 3a: Summary of ANOVA of Linear Regression of Relationship between Teachers -Students' Ratio and Students' Academic Performance in Post-Basic Schools in Adamawa State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3132.529	1	3132.529	23.007	.000^b
	Residual	10347.689	76	136.154		
	Total	13480.218	77			

a. Dependent Variable: Academic Performance
b. Predictors: (Constant), TEACHERS - STUDENTS' RATIO

Table 3a shows the **ANOVA summary** of the **linear regression** of the relationship between teachers-students' ratio and academic performance. The table indicates that the **regression** model is **significant** ($F_{(1,76)} = 23.007$, $p < .05$), which means that the model is able to predict the academic performance of students based on the teachers-students' ratio.

Table 3b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.482^a	.232	.222	11.66850

a. Predictors: (Constant), TEACHERS - STUDENTS' RATIO

Table 3b shows the **model summary** of the linear regression. The model shows that there is strong relationship between teachers –students' ratio and students' academic performance in post-basic schools in Adamawa State (r = 0.482). The table indicates that the **model** is able to explain **31.5%** of the variance in the academic performance of students (R^2 = .232, Adjusted R^2 = .222).

Table 3c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	41.262	3.084		13.380	.000
	TEACHERS - STUDENTS' RATIO	6.598	1.376	-.482	-4.797	.000

a. Dependent Variable: Academic Performance

Table 3c shows the **coefficients of beta** of the linear regression. The table indicates that the **constant** has a **positive** relationship with academic performance (β = 41.262, t(76) = 13.380, p < .05), while the **teachers-students' ratio** has a **negative** relationship with academic performance (β = -.482, t(76) = -4.797, p < .05). This statement means that there is a **strong inverse correlation** between the ratio of teachers to students and the academic performance of students in post-basic schools in Adamawa State. In other words, as the number of students per teacher increases, the academic performance of students decreases.

HO_2: There is no significant relationship between teachers' effective communication and students' academic performance in post-basic schools in Adamawa State.

Table 4a: Summary of ANOVA of Linear Regression of Relationship between Teachers' Effective Communication and Students' Academic Performance in Post-Basic Schools in Adamawa State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6836.498	1	6836.498	78.205	.000[b]
	Residual	6643.720	76	87.417		
	Total	13480.218	77			

a. Dependent Variable: Academic Performance
b. Predictors: (Constant), TEACHERS COMMUNICATION

The findings presented in Table 4a summarize the ANOVA results of the linear regression analysis conducted to determine if a significant relationship exists between teachers' communication and students' academic performance in post-basic schools located in Adamawa State. The analysis indicated a significant relationship between teachers' communication and students' academic performance in these schools, with an F-value of (1,846) = 1205.947 and a p-value of less than .05. Given that the p-value (0.000) is below the 0.05 alpha threshold, we can reject the null hypothesis. This indicates a significant relationship between teachers' communication and students' academic performance in post-basic schools in Adamawa State.

Table 4b: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.712[a]	.507	.501	9.34973

a. Predictors: (Constant), Teachers' communication

The model summary in Table 4b indicates that the regression model accounts for 58.7% of the variance in students' academic performance (R^2 = .507, Adjusted R^2 = .501).

Table 4c: Coefficients of Beta

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	27.740	3.220		8.616	.000
	TEACHERS COMMUNICATION	7.711	.872	.712	8.843	.000

a. Dependent Variable: Academic Performance

The coefficients of beta model in Table 4c show that the standardized coefficient of teachers' effective communication is .712 (t = 8.843, p < .05). This suggests that teachers' effective communication has a positive relationship with students' academic performance.

Findings of the Study

The following are the findings of the study. The result revealed that:

1. There is significant relationship between teachers-students' ratio and students' academic performance in post-basic schools in Adamawa State, $(F(1,76) = 23.007, p < .05)$, r – value = .482, $(R^2 = .232$, Adjusted $R^2 = .222)$.
2. There is significant relationship between teachers' communication and students' academic performance in post-basic schools in Adamawa State, $(F(1,76) = 78.205, p < .05)$, r – value = .712, $(R^2 = .507$, Adjusted $R^2 = .501)$.

Discussions of Findings

The research examined the connection between teacher effectiveness and student academic performance in Post-basic Schools located in Adamawa State, Nigeria. The results of the study are elaborated upon below. The results indicate a significant negative correlation between the teacher-student ratio and academic performance, which is consistent with numerous prior studies, establishing a coherent trend in the existing literature. Kaloki et al. (2015) previously noted a negative relationship between the teacher-student ratio and student performance, thereby reinforcing the current findings. Additionally, Idowu and Oluwole (2014) found a significant link between the student-teacher ratio and academic success in Mathematics, which aligns with the recent discovery. Likewise, a study conducted in India by Kumar and Singh (2019) highlighted the significant effect of the teacher-student ratio on students' academic performance, further corroborating the current evidence. The findings from Bello et al. (2021) also add to this consistent narrative, as they concluded that a significant relationship exists between the student-teacher ratio and students' academic performance. Together, these studies emphasize the necessity of maintaining an optimal teacher-student ratio to enhance academic achievement, stressing the importance for educational institutions to consider and address this factor in their planning and resource allocation.

Additionally, the findings reveal a significant relationship between teachers' communication skills and students' academic performance in post-basic schools in Adamawa State. The discovery of a substantial relationship between teachers' communication and students' academic performance in post-basic schools in Adamawa State underscores the crucial role that effective communication plays in influencing educational outcomes. This finding stresses the complicated nature of communication in the teaching-learning process. Teachers who employ clear and engaging communication methods are shown to positively influence students' academic success. Beyond mere information dissemination, effective communication fosters motivation, engagement, and a supportive learning environment. The study suggests that understanding individual needs, providing constructive feedback, and building a positive classroom climate are integral components of the teacher-student communication dynamic.

The recent study's identification of a significant relationship between teachers' communication and students' academic performance in post-basic schools in Adamawa State aligns with and further supports the findings of several prior studies. Ekpe and Essien (2014) observed a similar correlation in their research, specifically focusing on Social Studies. Their study highlighted that teachers' communication skills played a significant role in influencing students' academic performance in this subject. Additionally, Amie-Ogan and Omunakwe (2020) conducted research in public senior Post-Basic Schools in Port Harcourt Metropolis of Rivers State, finding that teachers' communication skills had a positive influence on students' academic performance. This reinforces the notion that effective communication by teachers is a consistent factor contributing to students' academic success across different regions and subjects. Furthermore, the research conducted in Nigeria by Oyinloye and Oyinloye (2017) also concurred with this finding, emphasizing the significant impact of teachers' communication skills on students' academic performance. Collectively, these studies create a cohesive narrative, emphasizing the universal importance of effective teacher communication in enhancing students' academic outcomes in various educational settings.

Conclusion and Recommendation

In conclusion, this research offers significant insights into the elements that affect students' academic performance in post-basic schools located in Adamawa State. The findings underscore the critical role of communication skills in shaping students' academic results. The outcomes indicate a necessity for educational stakeholders to prioritize and enhance these factors to foster an environment that supports optimal learning outcomes in post-basic schools. The findings also suggest that teachers who possess a strong grasp of their subject matter and communicate effectively are more likely to have a positive influence on students' academic performance. Additionally, the study emphasizes the necessity of maintaining an appropriate teacher-student ratio in post-basic schools within Adamawa State. Based on the study's findings, the following recommendations have been proposed:

1. The federal and state governments should advocate for and invest in policies aimed at reducing the teacher-student ratio in post-basic schools in Adamawa State. This may involve hiring additional teachers, establishing smaller class sizes, or implementing innovative teaching strategies to better accommodate larger classes.
2. The Ministry of Education should offer training programs for teachers to enhance their communication skills, focusing on effective information delivery methods, promoting student engagement, and fostering a positive classroom atmosphere.

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