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**TEACHERS' PERCEPTION OF FACTORS INFLUENCING  
TEACHING AND LEARNING OF PHYSICS IN SENIOR SECONDARY  
SCHOOLS IN MAIDUGURI METROPOLIS, BORNO STATE, NIGERIA  
WEST AFRICA.**

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**Abstract**

*This study investigated teacher's perception of factors influencing teaching and learning of physics in Senior Secondary Schools in Metropolis in Borno State Nigeria. The objectives of the study were to determine the extent to which teachers perceived: qualification, method of teaching, instructional materials and attitudes of both teachers and students' influence the teaching and learning of physics in Senior Secondary Schools. The study used however, all 25 physics teachers from six selected Senior Secondary School in Maiduguri Metropolis Borno State. However, the instrument used was researcher designed questionnaire evaluating of physics teachers' perception of factors influencing teaching and learning of physics. The instrument was subjected to validation process and its reliability index was 0.76 to analyze the data collected, the research questions were answered using descriptive statistics such as simple frequency, mean and standard deviation. The result indicated that the qualification of physics teachers was really an issue of utmost concern by physics teachers, effective physics teaching and learning methodology triggered and accelerated physics teaching and learning in the Senior Secondary Schools, while instructional materials were found to be an*

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*integral part of the successes recorded in classroom teaching and important in achieving aims and goals of teaching. Also, physics teachers and students' attitude towards physics teaching and learning was paramount factor in the performance of students. Based on the result of this study, it was recommended that: there is need to improve the quality of physics teachers. Government of Borno State should embark on serious in service training of physics teacher to equip them with skills for teaching physics in Senior Secondary Schools. Also there is need for physics teachers to try and understand the perceptions of their students and try to adopt instructional strategies that whatever, student perceived as easy would really turn out to be easy and whatever is difficult may be properly addressed to motivate and encourage study see the needs in learning physics improve their performance.*

## **Introduction**

Education is a light that shows mankind the right direction to surge. The purpose of education is not just making a student literate but adds rational thinking, knowledge ability and self-sufficiency (Damodharan & Rengararajan, 2009). Education is the medium for the acquisition of relevant knowledge, skills and attitudes for survival in a changing world. Teaching entails both the teachers and students. Thus, teachers and students' relationship is determined by the effective interaction in form of communication and instructional materials in teaching learning process (Adeniran, 2010).

Teachers perception on teaching is the process by which teacher interprets and organize sensation to produce a meaningful experience of both the human and non – human resources in instructional delivery. Therefore, the success of any learning process depends largely on the teachers' qualification, experience and effective use of instructional materials (Irwin, Ball & Des Bow, 2012). The place of instructional materials in effective implementation of teaching and learning process cannot be undermined.

Perception can be defined as the organization, identification and interpretation of sensory information in order to represent and understand the environment. It is seen as the way an individual thinks about or understands someone or something (Little, 1999). Perception is not just the passive receipt of sensory signal but is a shaped by learning, memory, expectation and attention (Irwin, Ball & Des Bow, 2012). Teachers' perception has to do with the feeling about a given issue, that is, what individual teacher feel about the utilization of instructional materials.

Utilization to large extent judges the value of instructional materials by the degree in which is singly or collectively satisfied instructional need of students. The ability of the teacher to effectively utilize the instructional materials offers meaningful

and productive learning experience. Omoosewo (2008) submitted that efficiency of any institution depends to a large extent on academic competence of the teaching staff, as no educational system can rise above the quality of its teachers. Also, Ogunleye (2005) explained that teachers' experience and qualification had potent relationship with their job performance.

The National Policy and Education (FRN, 2009) submitted that a nation cannot achieve greatness unless she directs her efforts in technology to develop the resource in the country.

The ability of the teacher to impact knowledge depend greatly on the method he/she applies during the teaching/learning process. Where the method is defective, the students stand to loss as they hardly benefit from the lesson. According to Uya (2008) for teachers to be able to ensure and enhance classroom learning, they have to possess necessary pedagogical skills which have to be systematic and methodical, especially in physics.

After having observed physics result over a period of five (5) years, from 2000 – 2004 in both National Examination Council (NECO) and West African Examination (WAEC) office in Maiduguri Metropolitan Council, Borno State, Nigeria, there appears to be a pattern of poor performance. The persistence rate of failures is not frustrating to the students and their parent only, its effects are equally grave to the society in terms of dearth of man power in an area of the economy. From the research point of view, it appears that not much research have been conducted in Maiduguri Metropolitan Borno State, Nigeria. For these reason, these paper examine the extent to which teachers' perceived factors like teacher qualification, method of teaching, instructional materials, and students attitude towards physics as a factors that influence the teaching and learning of physics in Maiduguri Metropolitan Borno State. Nigeria.

### **Literature Review**

Abubakar 2013 examined the effect of teachers' qualification on performance in mathematics among Secondary School Students in Kaduna State. Random sample of 1600 students were selected across the four division in the state namely: Anchan, Kaduna, Kafanchan and Zaria which participated in the study. Two instrument teachers save assessment test and 30 items four multiple choice. Physics achievement test constructed by the research were administered. The analysis of the variance revealed that significant difference exists between students' performance on the account of their teachers qualification. The more knowledgeable the teacher the more effective his/her teaching will be.

Adeluku (2012) examined the influence of instructional materials in teaching and learning of physics in Senior Secondary School. A two group pre-test, post-test quasi – experiment design was adopted for the study. A total of 100 Senior Secondary one (S S I) mathematics students were selected from five (5) schools in Yankuur Local Government Area of Cross River State through a sample random sampling techniques. Fifty (50) S S I students experimental group were taught with instructional materials.

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The study revealed that the students taught with instructional materials performed significantly better than those taught without instructional materials and also that the use of instructional materials generally improve student understanding of concept and led to the high academic achievement.

Hadaga (2012) examine the problems of teaching physics in Senior Secondary Schools in Maiduguri Metropolis Borno State, Nigeria. The researcher design a self-developed questionnaire and discovered that instructional materials is of great paramount in achieving student's performance in physics.

Maruff and Amos (2011) examined the effect of using standardize and improvised instructional materials on academic achievement of Secondary School Mathematics Students in Oyo State Nigeria. The research designed adopted was quasi – experimental using pre-test, post – test, non-randomized control group. Purposive sampling was used to obtain a sample of three co-educational secondary schools. Each school provided one S S III class for the study. The instrument were physics achievement test to measure students' achievement and teachers' instruction guide to train the teachers' in the experimental groups. Findings revealed that there was a significant difference in the achievement of students taught using a standard instructional materials, those taught with improvised instructional materials and those in the conventional instructions. Thus, the students' taught with improvised instructional materials obtain the highest achievement score at post-test ( $f = 80.42$ ), followed by those with standard instructional materials ( $f = 71.12$ ). While the control group scored the lowest ( $f = 38.89$ ). Also there was no significant effect on gender on students' achievement in physics. The research conclude that the utilization of improvised instructional materials promote and enhance effective teaching and learning process, thus, physics teachers should be encourage to used them in their lesson.

### **Research Questions**

The following questions were answered in this study:-

1. To what extent physics teachers perceived qualification as a factor that influence teaching and learning of physics in Senior Secondary Schools in Maiduguri, Borno State Nigeria.
2. To what extent physics teachers perceived methods of teaching as factor that influence teaching and learning of physics in Senior Secondary School in Maiduguri, Borno State Nigeria.
3. To what extent physics teacher's perceived instructional materials as a factor that influences teaching and learning of physics in Senior Secondary Schools in Maiduguri, Borno State Nigeria.
4. To what extent physics teachers perceived attitude as a factor that influences teaching and learning of physics in Senior Secondary Schools in Maiduguri Metropolis, Borno State Nigeria.

## Method

### Participants

The target population for the study comprised of all the 25 physics teachers from six (6) Senior Secondary Schools Sampled. All the twenty (25) physics teachers in the population were used as sampled for the study due to the limited number of physics teachers. Table 1: below give the distribution of the population and sample.

**Table 1**

**Distribution of population and sample over the selected schools.**

Schools	Population		Total	Sample		Total
	M	F		M	F	
P	5	1	6	5	1	
Q	4	1	5	4	1	
R	5	-	5	5	-	
S	3	1	4	3	1	
T	2	1	3	2	1	
U	1	1	2	1	1	
Total	20	5	25	20	5	25

### Research Instrument

The instrument used for data collection of this study was self-developed questionnaire on teachers' perception on qualification, method of teaching instructional materials and attitudes as a factors that influence teaching and learning of physics in Senior Secondary Schools in Maiduguri Metropolis, Borno State Nigeria. It consist of two sections, section A was designed for collection of teachers bio-data which included: gender, teaching experience, qualification of teachers such as diploma, NCE, B.Sc. B.Ed. and M. Ed. Section B has 25 items constructed on teachers perception of the four variables mentioned above on how each one influenced teaching and learning of physics. The instrument was designed on five points likert-type scale.

The reliability efficient of the instrument was established usingCronbach Alpha and its reliability coefficient of 0.71 therefore, the questionnaire was reliable for gathering data for the study.

### Procedure for data collection

After obtaining an introductory letter from the lead of department of education, Borno State University BOSU, the researcher went to all the six Senior Secondary School in Maiduguri Metropolis and solicited permission from each principal to use all physics teachers and Senior Secondary School two students (S S II) for the study. The researchers requested two physics teachers from each of the schools visited to serve as research assistants. The Senior Secondary School two students (SS III) physics teachers from each of the school selected received training on the use of the strategy appropriate

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for administrating the questionnaire one week ahead of time. The following weeks, on arrival of each school the two research assistants collected the questionnaires and distributed it to the students and went round the class together with the researcher to ensure no sharing of views or opinions by the students, but help was rendered to those who could not read well. The researcher with the help of the two researcher's assistants retrieved the completed questionnaires. The exercise lasted for a week.

**Method of data analysis**

For this study, the data collected was analyzed using descriptive statistics of mean standard deviation and frequency. The mean and standard deviation was used to find out the extents to which the following variables physics teachers' qualification, physics teachers teaching method, physics teachers instructional materials, and attitudes towards physics influence the teaching and learning physics in Senior Secondary School in Maiduguri Metropolis, Borno State Nigeria. The frequency and the mean values were used to draw. The graph of normal curve to determine the value of responds to each variable under the natural curve, frequency is against the vertical line called Y – axis and mean value against the horizontal line X-axis respectively.

**Result**

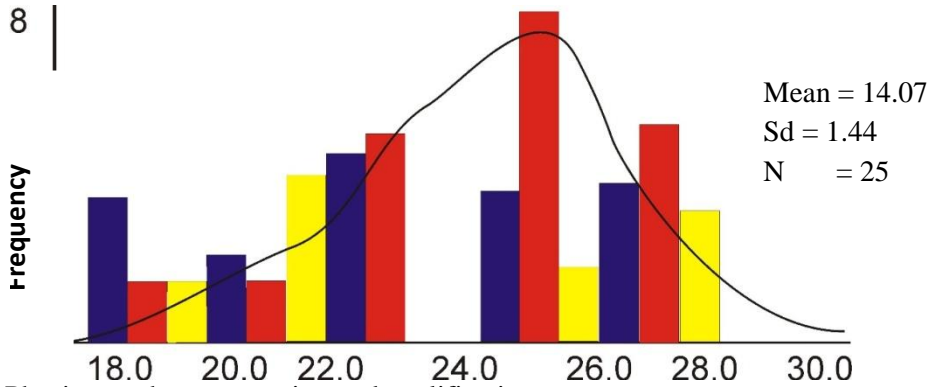
The data collected was analyzed in line with the respective research questions. Question one: to what extent physics teachers perceive qualification as a factor that influence teaching and learning physics?

**Table 2**

**Physics teacher's perception of the qualification of physics teachers.**

Question	N	Mean	SD	Sd. error	Variance	Range
Teachers perception	25	14.07	1.44	0.10	4.16	5

**Table 2:** Present a mean and standard deviation distribution values of physics teachers perception related to physics teachers' qualification as a factor that could affect teaching and learning encountered in Senior Secondary School in Maiduguri Metropolis, Borno State, Nigeria.



Physics teachers perception and qualification

Fig a:

Normal curve of perception of physics teachers' response on qualification.

Figure a: Revealed the result of physics teachers' perception related to qualification as a factor that influence physics teaching and learning. The result showed that the perception of physics teachers and students to the qualification as a factor in determining effective physics content delivery we were found to be approximately normally distributed with  $N = 25$ . Means = 14.07 and  $Sd = 1.44$ . This perception could be interpreted to mean that effective physics teaching usually occurred within the framework of the attainment of requisite and relevant physics teaching qualification.

Research questions 2: to what extent physics teachers perceived methods of teaching as a factor that influence teaching and learning of physics?

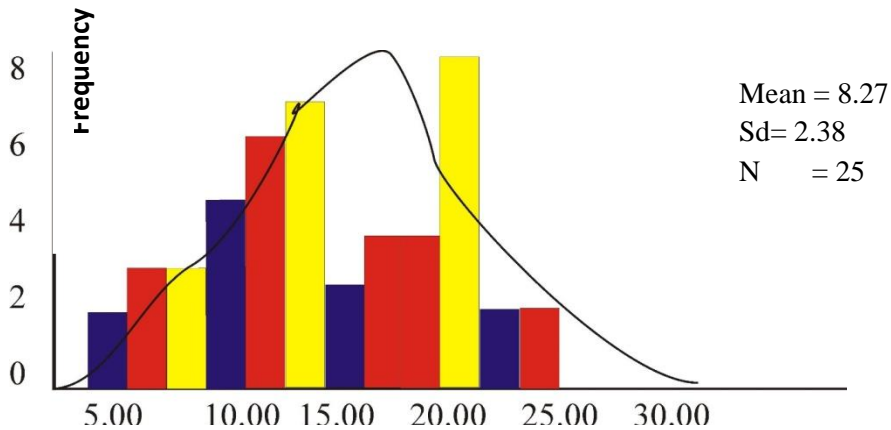
Table 3:

Physics teachers' perception of the influence of methodology on physics teaching and learning.

Methodology	N	Mean	Sd	Std error mean	Variance	Range
Teachers perception	25	8.27	2.38	0.35	11.33	9.33

Table 3: present mean and standard deviation distribution values of physics teacher perception related to physics teachers' methodology as a factor that could affect teaching and learning of physics and encountered in Senior Secondary Schools in Maiduguri Metropolis, Borno State, Nigeria.

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Teachers perception on instructional materials

Fig b: normal curve on perception of physics teachers' response on methodology.

Figure b. above revealed the results on physics teachers perception related to methodology as a factor that influence physics teaching and learning. It was observed from the analysis that the result of the perception of physics teachers' response on the methods of teaching and learning physics showed that, project techniques, discussion method, questioning method and problem solving techniques all congregated to respondents' opinion that the method lead to an effective physic teaching and learning. This was established from the normal curve distribution of physics teachers' response on what they had perceived as effective methodology of physics teaching and learning. The normal distribution curve (fig b.) of the physics teachers perception has N = 25, mean = 8.27 and sd 2.38.

Research question 3: to what extent physics teachers' perceive instructional material as a factor that influence teaching and learning of physics?

**Table 4**

**Physics teachers' perception of influence of instructional materials on physics teaching and learning.**

Instructional materials	N	Mean	Sd	Std error mean	Variance	Range
Teachers perception	25	8.34	1.40	0.24	5.48	7.25

Table 4 presents mean and standard deviation values of physics teachers' perception of physics instructional materials as a factor that could affect teaching and learning of physics encountered in Senior Secondary Schools in Maiduguri Metropolis, Borno State Nigeria.



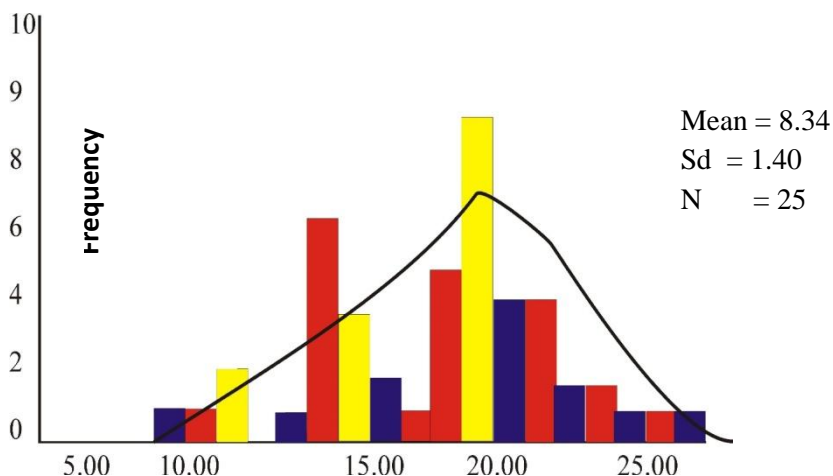


Fig c: teachers' perception and instructional materials.

Fig c: normal curve on perception of physics teachers' and response on instructional materials. The result in fig c: revealed that physics teachers' perception of instructional materials such as visual aids, like physics text presentation by the use of electronic devices (Computers), audio visual aids like physics video projection and use of concrete instructional materials like football pitch and school farm land usually enhance and lead to effective physics teaching and learning. This was affirmed by the normal curve distribution of physics teachers' on instructional materials that really guided classroom physics teaching and learning. Fig c: the normality distribution curve on the physics teachers' perception N = 25 means = 3.4 Sd = 1.40.

Research question 4: to what extent physics teachers' perceive attitude as a factor that influence teaching and learning physics.

**Table 5:**  
**Physics teachers' perception of the influence of attitude on physics teaching and learning.**

Attitude	N	Mean	Sd	Std error mean	Variance	Range
Teachers perception	25	10.8	1.07	0.16	2.32	4.66

Table 5 presents mean and standard deviation distribution values of physics teachers' perception of attitude as a factor that could affect teaching and learning of physics encountered in Senior Secondary Schools in Maiduguri Metropolis, Borno State, Nigeria.

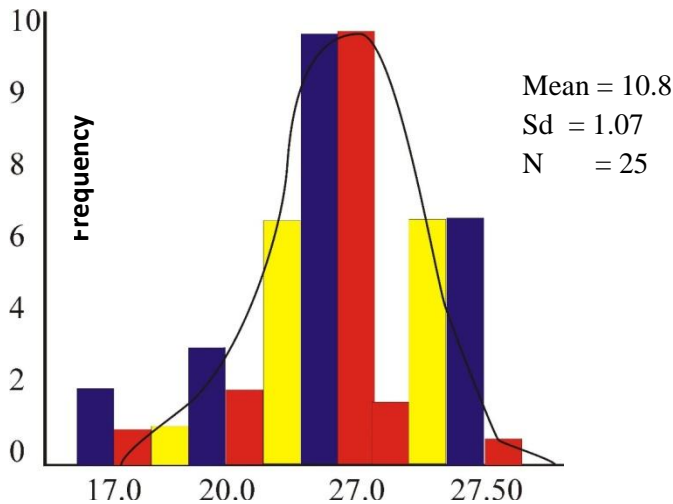


Fig d: normal curve on perception of physics teachers' response on their attitude towards physics.

Fig d: revealed results of physics teachers' perception related to attitude as a factor that could influence physics teaching and learning.

The results indicated that many physics teachers believe that physics teaching and learning were for special set of students. Furthermore, mechanic usually discourage students from learning physics and concrete misconception about physics that has no relationship with the social wellbeing of people.

### **Summary of the findings**

The following summary of the findings of the study were derived from the results.

- i. The results revealed that the extent to which physics teachers perceived teachers' qualification as a factor is positive. This implies that lack of qualified physics teachers has an adverse effect on the students' academic performance.
- ii. The result revealed that the extent which physics teachers perceived teachers' method of teaching as a factor is positive. This implies that effective method of teaching physics is necessary if physics is to be taught well in Secondary Schools.
- iii. The result revealed that the extent to which physics teachers' perceived physics instructional materials as a factor is positive. This implied physics instructional material and necessary and essential for effective teaching of physics.
- iv. The result revealed that the extent which teachers' perceived attitude towards physics as a factor is positive is implied attitude towards physics need to be properly address this was because the finding of this study attested that the way students perceived a subject determine their failure or success.

### **Discussion of the findings**

The findings of this study in respect to research question 1 revealed that most of the physics teachers perceived qualification as one of the factors considered to have a profound effect on teaching and learning of physics also, it was found that teachers' teaching qualification has an important contribution to students' academic achievement. The findings are partly in agreement with Umoru 2013 who examined the effect of teachers' qualification on performance in physics among Senior Secondary School Students in Kaduna State. In his study he found that significant differences existed between students' performance on account of their teachers' qualification. Furthermore, Etuk, Afargidah and Uya (2013) Abubakar (2013) Adediwura (2007) and Hadaga (2012) found that lack of qualified physics teachers in most Senior Secondary Schools is one of the most significant factor affecting the academic performance of the students, therefore, the qualification of physics teachers' was really an issue of utmost concern which needs to be look into with serious concern by both Federal and State Government because the key to quality of teaching and learning in our schools is the availability of well qualified and competent teachers.

The findings of the study is respect to research question 2 revealed that teaching method has a significant influence on Students' Academic Performance in Senior Secondary Physic in Maiduguri Metropolis Borno State Nigeria. The finding and the discourse the submission made Umoren (2001) in a research on the method of teaching like ability of the teacher to impact knowledge so depends greatly on the method he applied during teaching/learning process. Where the method is defective the students stand to lose as they hardly benefit from the lesson. Whether formal or informal education, teaching method effectiveness makes for retention of the learnt concept, similarly, Uya's (2008) study found that for teachers to be able to ensure other and enhance classroom learning they have to possess necessary pedagogical skills which have to be systematic and methodical. They have to explore and make good use of their knowledge of instructional skills/strategies. Whether the method adopted falls within the specimen of mass or individual instructional method, Esu (2003) opines that teaching by its nature requires a variety of method to facilitate teaching and learning in the class and to develop the child's knowledge and understanding to the maximum.

With respect to research questions 3, the study find that instructional materials have significance influence on students' academic performance in Senior Secondary School Physics in Maiduguri Metropolis, Borno State Nigeria. This finding is the line with the findings Saleh's (2006) study on the role of teaching aids in teaching agricultural science in Secondary Schools in Jere Local Government Area of Borno State, the study revealed that teachers and the students agreed that methods of teaching and lack of adequate appropriate teaching materials were responsible for students' failure. The finding also confirmed that of Alkali (2002) on effect of instructional materials on the quality of Students' Academic Achievement whose result showed that instructional are indispensable factors in academic achievement of educational goals, because it changes the traditional methods of teachers' talks and students listening only which later makes

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the lesson boring. Also it adds meaning to verbal instruction and effective understanding of each topic, similar result of students were obtained by Adeluku (2012) who investigated the influence of instructional materials on academic performance of senior secondary schools students in cross River State and found that the students taught instructional materials performed significantly better than those taught with instructional materials and also that the use of instructional materials generally improved students' understanding of concept and led to high academic achievements. Maruff, Amos and Olawale (2011) also found that there is significant differences of a students' taught using a standard instructional materials, those taught with improvised instructional materials and those in the conventional instructions. Thus, its therefore, instructive to say that physics teachers need to be resourceful in instructional materials selection, planning and utilization. Improvised instructional materials from works and enhance effective teaching-learning process, thus physics teachers should be encourage to use them in secondary education programme.

The finding of the study in respect to the research question four revealed that students attitude have a positive influence on both their academic performance in Senior Secondary School Physics in Maiduguri Metropolis of Borno State, Nigeria.

### **Recommendations**

1. Teachers of physics should periodically be giving opportunity to update their knowledge based on their subject area, in service training and retraining courses to increase their knowledge base on their subject area.
2. More than teaching method should be appropriately adopted in a single lesson presentation by a teacher so as to carry every students along create, variety, minimize boredom and enhance interest in what is being taught and learnt.
3. Physics teachers should understand the perception of their students and try to adopt instructional materials strategies that whatever, students' perceive as difficult would really turn out to be easy and whatever is difficult may be properly address to improve teaching and learning of physics for better performance.
4. Therefore, to improve teaching and learning physics in senior secondary schools in Borno State there is a need for qualified physics teachers to adopt teaching methods that are capable of enhancing teaching and learning of physics for improved performance.

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