Influence of Social Studies Health Related Topics and Teaching Strategies on Students' Knowledge and Handling of Ebola Disease in Osun State Secondary Schools

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Abstract - *This research investigated the influence of Social Studies health related topics and strategies on students' knowledge and handling of Ebola virus disease with a view to promoting hygienic culture and as a way of preventing Ebola outbreak in Osun State, Nigeria. The sample comprised 182 students from three intact classes selected from three junior secondary school one (JSSI) in Osun State using simple random sampling technique. There were two experimental groups and one control group. Two instruments were used for the research. Data collected were subjected to t-test and Analysis of Covariance (ANCOVA). The result showed that Social Studies health related topics and the instructional strategies had influence on students' knowledge (t =74.28, p<0.05) and handling of Ebola virus disease (t =34.81, p<0.05). The result also indicated that there was a significant difference in the effectiveness of demonstration, discussion and teacher expository strategies on students' knowledge (F = 67.204, p < 0.05) and handling of Ebola virus disease (F = 20.776, p < 0.05) in favour of demonstration and discussion strategies (p = 0.000). This study concluded that Social Studies health related topics can be used to control the outbreak and spread of Ebola disease in Osun State.*

Keywords: *Social Studies Health Education, Social Studies Strategies, Ebola Knowledge, Ebola Disease.*

INTRODUCTION

Ebola virus is one of the viral families known as *Filoviridae* which causes *E*bola hemorrhagic fever. Scientists also call it *Filovirus* that often causes internal and external hemorrhage (bleeding) or a profuse hemorrhage in the body (inside and outside) which is often occurred with a very high fever as the disease progresses. The uncontrolled loss of blood and fluid can cause hypertensive shock which can lead to the death of any Ebola-infected patients [1, 2]. Ebola virus is also recognized as a "zoonotic" virus in that it is spread to human beings from animals like chimpanzees, forest antelopes, gorillas, monkeys, porcupines and bats etc. Human beings can also transfer the virus to each other. It is possible for people to acquire Ebola when they come in contact with the blood and bodily fluids of the effected animals or human beings through the eyes, broken skin, mouth, or nose. Ebola can as well be spread via contact with the infected objects, such as knife, needles, scissors, blade, clipper etc. Nevertheless, it has been confirmed that insects like mosquitoes are not carrying virus of Ebola [3, 2].

Davis and Balentine [1], Nall and Krucik [2]onsidered Ebola disease is one of the most deadly viral infections in that the death rate is very high during outbreaks. According to these scientists, the past record of people that died through Ebola virus disease outbreaks was between 40% to 100% of humans infected (see Table 1). They further explained that the initial detection of Ebola Virus Disease (EVD) started in one village in Zaire (currently, the Democratic Republic of Congo or DRC) in 1976. This village was near one river called Ebola River; the disease was named after this river. Then, the virus was identified in person-to-person contact transmission. Among the 318 patients diagnosed with Ebola at that time, 88% died, since then, there have been multiple outbreaks of Ebola virus (see Table 1).

Davis and Balentine [1] reported that during Ebola hemorrhagic fever outbreaks, health-care workers are most vulnerable to Ebola because they often deal with blood and bodily fluids. Family members and friends associated with an infected person are also vulnerable to the disease. It has been said by these physicians that presently there is no vaccine to cure Ebola virus but measures are taken to

keep the infected person as comfortable as possible. Infected person can also be given supportive care measures such as medications to sustain normal blood pressure, manage electrolyte balances, provide extra oxygen, provide intravenous fluids to prevent dehydration if needed, treat co-existing infections and prevent other infections from occurring.

Nall and Krucik [2] observed that Ebola virus has been in existence for more than 35 years, before the recent outbreak which started in March 2014 in West Africa. This outbreak has proven more lethal, severe, and widespread than previous outbreaks. In this new outbreak many people in the larger city centers of West Africa were exposed to the virus, thus caused more infections and deaths. This outbreak in Africa spread to Guinea, Liberia, Sierra Leone and Nigeria. About 122 infected people were diagnosed and 78 died before April. 1, 2014.

Recently in Nigeria the news of Ebola disease outbreak were all over the place, following the arrival of Patrick Sawyer who came all the way from Liberia to Lagos. Through whom the disease was contacted and spread to some part of the country. After the demise of Mr. Sawyer in a Lagos hospital, about eight people who contacted the disease through him (directly or indirectly) died of the virus.

Table 1: Record of Ebola Virus Disease Outbreaks from 1976 to 2014

Year	Country	Ebola Virus Species	Cases	Deaths	Case Fatality
1976	Sudan	Sudan	284	151	53%
1976	Democratic Republic of Congo	Zaire	318	280	88%
1977	Democratic Republic of Congo	Zaire	1	1	100%
1979	Sudan	Sudan	34	22	65%
1994	Cote d'Ivoire	Taï Forest	1	0	0%
1994	Gabon	Zaire	52	31	60%
1995	Democratic Republic of Congo	Zaire	315	254	81%
1996	South Africa (ex-Gabon)	Zaire	1	1	100%
1996	Gabon	Zaire	60	45	75%
1996	Gabon	Zaire	31	21	68%
2000	Uganda	Sudan	425	224	53%
2001-2002	Congo	Zaire	59	44	75%
2001-2002	Gabon	Zaire	65	53	82%
2003	Congo	Zaire	35	29	83%
2003	Congo	Zaire	143	128	90%
2004	Sudan	Sudan	17	7	41%
2005	Congo	Zaire	12	10	83%
2007	Uganda	Bundibugyo	149	37	25%
2007	Democratic Republic of Congo	Zaire	264	187	71%
2008	Democratic Republic of Congo	Zaire	32	14	44%
2011	Uganda	Sudan	1	1	100%
2012	Democratic Republic of Congo	Bundibugyo	57	29	51%
2012	Uganda	Sudan	7	4	57%
2012	Uganda	Sudan	24	17	71%
2014	Guinea	NA	2,707	1,708	63%
2014	Sierra Leone	NA	9,446	2,758	29%
2014	Congo	Zaire	66	49	74%
2014	Mali	NA	8	6	75%
2014	Liberia	NA	8,018	3,423	43%
2014	Nigeria	NA	20	8	40%
2014	Senegal	NA	1	0	0%

Source: World Health Organization [4], United State Centers for Disease Control and Prevention [3]

A large portion of people in Nigeria live and interact in close contact, this situation could prove disastrous if there is no quick action to contain the disease. In the effort of the Nigerian government to curb the disease, Federal government of Nigeria closed down primary and secondary schools. Learners were not allowed to resume to school as scheduled on their regular school calendar. In the first instance many people questioned the decision of government on this. But, looking at the type of interaction existing among the Nigerian primary and secondary school students, it may be catastrophic to allow the virus to penetrate into the Nigerian primary and secondary school setting. This is a setting where children and youth from different home environment/background, level of exposure and adventure come, sit, play and eat together freely without medical facilities to prevent outbreak of such lethal disease. Therefore, the decision of government to announce a new resumption date is justified in order to prevent the disease from being spread through these groups of people who are the largest percentage of the population.

The Nigerian Government also with the support of World Health Organization (WHO), United States Centers for Disease Control and Prevention (CDC), Médecins Sans Frontières (MSF), UNICEF and other partners went into action for effective coordination of the response that included the rapid establishment of an Emergency Operations Centre. Technologies and infrastructures were put in place to help find cases and track potential chains of transmission of Ebola virus disease in Nigeria. Another step that was taken to prevent the spread of the disease is the provision of health facilities in the schools. Health facilities to test and take care of victim and to prevent the spread were provided for by the government and were made mandatory for every school both public and private to have in their schools. This must be done before the students resume back to school. The new resumption date gave enough time for the provision of the facilities to go round. Media houses were not left out they were saddled with the responsibility of creating awareness to the public about the deadly disease. The good result of all efforts of the government and other stake holders was the declaration of Nigeria as an Ebola free nation by the WHO on 20th October 2014.

Nevertheless, Nigerian governments and WHO staff in the country are not ignorant of the fact that the country remains vulnerable to Ebola due to some factors. For instance, Nigerian "Giant of Africa" is a friendly nation, her immigration policies are not as strict as that of other nations, and they permit movement of people in and out of the country from different parts of the world. Also, Nigerian environment is an abode to some of the animals that transmit the disease such as chimpanzees, antelopes, gorillas, monkeys, porcupines, and bats. Many Nigerian consume some of these animals as source of protein while many in the rural areas keep some of these animals especially monkey as domestic animals. Another situation is that of multitude of bats that live together with Nigerian students in the university and secondary schools' environment as it is in the case of Obafemi Awolowo University Ile-Ife. All these, among others reasons confirmed that the country remains vulnerable to Ebola disease. In view of this, there is a need to keep sight on the disease, further steps should be taken to prevent the disease from resurfacing in Nigeria. Education sector where the public believed could be the easiest place to contact and spread the disease to the nook and cranny of the nation should be part of the campaign to continually prevent the outbreak.

The rationale behind the introduction of Social Studies into the Nigerian educational programme is to address societal issues [5]. Its curriculum was design in such a way that it could meet the needs and solving the problems arising from man's interaction and utilization of the environment via education. The general objective of this study is to investigate whether education could be used as a tool to control the outbreak or the spread of Ebola disease in the Nigerian society. The study wanted to find out whether Social Studies education in Nigeria has embedded ability to inculcate in the learner knowledge, skills and attitude of personal hygiene and hygienic environment via the teaching of its health related contents. Therefore, the specific objectives of the study are to:

a. investigate the influence of Social Studies health related topics on studensts' knowledge of Ebola virus disease in Osun State;
b. examine the influence of Social Studies health related topics on student's handling of Ebola virus disease in the State; and
c. effects of demonstration and discussion strategies on students' knowledge and handling of Ebola virus disease

Research Questions
Two research questions were raised for this study they include:

1. Will the teaching of Social Studies health related topics have significant influence on students' knowledge about Ebola virus disease?
2. Will the teaching of Social Studies health related topics improve students' handling of Ebola virus disease?

Ho$_1$: There is no significant influence of demonstration and discussion strategies on student' knowledge of Ebola virus disease?

Ho$_2$: There is no significant influence of demonstration and discussion strategies on students' handling of Ebola virus disease?

Theoretical Framework

This study is based on social constructive learning theory. The basic principle behind social constructivism is that knowledge is constructed through social interaction. According to social constructivists such as John Dewey, Kenneth Gergen, Albert Bandura, and Lev Vygotsky, learner develop ideas and give meaning to situations based on the individuals views and experiences. Learners learn by experimentation not by being told what will happen, they learn to make their own inferences and discoveries and conclusion. Construct of learning is understood to be a process in which the learners develop an internal picture or illustration of knowledge [6]. Social constructivism accepts as true that reality is formed by a social consensus and can be measured by social interaction. Social constructivism requires two or more participants who must be involved in some form of interactions for knowledge to be constructed [7]. Bandura [8] posited that people learn from one another, via observation, imitation, and modelling.

This same principle guides the use of demonstration and discussion strategies in this study. Demonstration strategy is a scenario where a model behavior is presented in the class. In an instructional situation the behaviour which is going to be modeled should be any kind of desirable or appropriate behaviour that is going to be developed by the student [9]. In this study students were taught how to develop hygienic culture with demonstration strategy (live presentation). Bandura [8] said that the way in which a model behavior is presented is very important. Educator should take this into consideration whether it is a live presentation, or presented through television, movies, or recorded material etc, because if presented

well all of these sources of enforcement can motivate the student to have a desired behaviour.

Furthermore, Teague [10] buttressed that learners come together with some previous knowledge gained from their social experiences. When they engage in some form of discussions, their prior knowledge is exchanged in a transaction. During this transaction, the participants negotiate meaning and knowledge is constructed. This is in line with the use of discussion strategy in this study. The news of Ebola is all over in the Nigerian society it is believed that students being member of the society have different level of awareness about Ebola diseases. This study provides opportunity for the students to share and exchange views about Ebola virus disease. Vygotsky [11] recommended interaction with more knowledgeable others who provide adequate information on the subject matter, these can include the teacher, older adults or peers. Discussion strategy in this study allowed students to interact with the teacher, research team and peers. In view of this, this study has the support of social constructivism.

Research Methodology

This study adopted the non-equivalent pre-test post test control group design. The population comprised junior secondary school one (JSSI) students in Osun State. The sample consisted of 182 junior secondary school one students selected from three junior secondary schools using simple random sampling technique. From each of the three selected secondary schools, one intact JSSI class was randomly assigned to the experimental groups or control group. All the groups were taught the same content with different strategies.

Two instruments were used for this study namely (1) Students Ebola Knowledge Test (SEPK), and (2) Students Ebola Prevention Skills Observation Checklist (SEPS). The SEPK was used to gather data on the influence of education on students Ebola knowledge. It has two sections, section A contained instruction and five items on demographic data of the respondents. Section B consisted of a multiple choice test of 20 items on student's knowledge about Ebola virus disease. SEPS was used to elicit information on how students handle Ebola disease. It contains five items on students' personal hygiene and hygienic environment which the research team observed in the respondents and rated according to the performance of individual respondents. The study was carried out in five weeks. The first week was used to strategize with

the research assistants and the school authorities. The second week was used to administer the instrument as the pre-test. The following two weeks were used to expose the students to different treatments while the last one week was used to administer the instrument as the post test.

The students in the first experimental group were taught with demonstration strategy. In the class, teacher introduced the new topic "Personal Hygiene and Hygienic Environment: A Way Out of Ebola Virus Disease" after which some members of the research team demonstrated how one can contact Ebola virus through handshaking. An experiment was used to demonstrate a man with clean hands shook hand with another man with colour blue powder in his palm (the colour blue is to demonstrate that he has Ebola virus disease in his body) after the handshaking the colour blue appeared in the palm of the man with clean hand showing that he has contacted the virus. Without washing the hand the man used the hand to hold a loaf of bread immediately the colour appeared on the loaf of bread. He ate and shared parts of the bread with another man thus he contacted and spread the disease carelessly.

The students in the experimental group B were taught with discussion strategy. The teacher introduced the new topic "Personal Hygiene and Hygienic Environment: A Way Out of Ebola Virus Disease" and asked students to say what they understand and what they think about hygienic behaviour and Ebola disease. After students' contributions, the teacher further explained the importance of hygienic behaviour as a way of preventing Ebola virus disease outbreak. Finally students were given opportunity to ask and answer questions from the teacher and research team. The students in the control groups were also taught the topic "Personal Hygiene and Hygienic Environment: A Way Out of Ebola Virus Disease" with the conventional expository method. The teacher explained the meaning of personal hygiene, hygienic environment and ebola virus disease. He further described hygienic habit as a way of preventing oneself from contacting ebola disease.

RESULTS

Data collected were subjected to t-test and one-way analysis of covariance (ANCOVA) to answer research questions raised and to determine whether to reject or accept the research hypotheses generated.

Research Questions 1: Will the teaching of Social Studies health related topics have significant influence on students' knowledge about Ebola virus disease?

The scores of the students obtained in the pretest and post test with the use of SEKT were subjected to t-test statistical analysis to answer the research question. This was tested at 0.05 level of significance. The essence of this question is to find out whether Social Studies health related topics can promote students' knowledge about Ebola virus disease.

Table 2: t-test Summary of the Pretest and Post Test Score of the Students on Ebola Knowledge (N=182)

Test	Mean	t	Sig.
Pretest knowledge Performance	5.1813		
Post Test knowledge Performance	13.9341	74.280	.000

df= 362

The results in Table 2 showed that the teaching of Social Studies health related topics has significant influence on students' knowledge about Ebola virus disease (t =.74.28, p < 0.05). Specifically, the teaching of *personal hygiene (*e.g. hand washing) and *hygienic environment* (i.e. sanitation) in Social Studies contents with the use of discussion and demonstration strategies as a way of preventing the spread of deadly diseases like Ebola enabled students to gain more knowledge about Ebola virus disease. For instance, in the classroom discussions students learnt many things from different opinions and views of colleagues and more knowledgeable others (the teacher and the researchers) about Ebola disease and how it can be contacted. These enriched students' knowledge about the disease as revealed in the study. Not only that, the students that were exposed to demonstration strategy in the study were motivated to ask several questions on how someone who lack culture of *personal hygiene* can carelessly contact Ebola virus disease through hand shaking as being demonstrated to them. Meanwhile, answers provided by the teachers and the researchers would have helped the students to acquire more knowledge about Ebola virus disease. Therefore, with the students' pool of experiences, it can be said that the teaching of Social Studies health related topics can promote students' knowledge about Ebola virus disease.

Research Question 2: Will the teaching of Social Studies health related topics improve students' handling of Ebola virus disease?

The scores of the students obtained in the pretest and post test with the use of SEPS were subjected to t-test statistical analysis to answer research question two. This was tested at 0.05 level of significance. The essence of this question is to determine whether the teaching of Social Studies health related topics can improve students' handling of Ebola virus disease.

Table 3: t-test Summary of the Pretest and Post Test Score of the Students on Ebola Prevention Skill (N=182)

Test	Mean	t	Sig.
Pretest knowledge Performance	1.3187	34.811	.000
Post Test knowledge Performance	2.3077		

df=362

Results in table 3 revealed that the teaching of Social Studies health related topics has influence on students' handling of Ebola virus disease (t = 34.81 p < 0.05). Teaching concept of Ebola via Social Studies contents like *personal hygiene* and *hygienic environment* in a practical way as provided in demonstrations instructional strategy, play a significant role in developing students' skill in handling Ebola virus disease. Practical demonstrations of the benefits of the culture of personal hygiene as against the danger inherent in the lack of culture of personal hygiene help students to gain skills in handling Ebola virus disease. Therefore, it can be said that the teaching of Social Studies health related topics can promote students' handling of Ebola virus disease.

Ho₁: There is no significant difference in the effectiveness of demonstration, discussion and teacher expository strategies on student' knowledge about Ebola virus disease.

The scores of the students in the experimental and control groups obtained with the use of SEKT were subjected to analysis of covariance (ANCOVA) to determine whether the hypothesis should be rejected or not. This was tested at 0.05 level of significance. The decision role is such that null hypothesis (H_0) is rejected if the value of Sig. (2-sided) is less than 0.05. The essence of this hypothesis is to determine the effectiveness of demonstration, discussion and teacher expository strategies on students' knowledge about Ebola virus disease.

Table 4 indicated that there is a significant difference in the effectiveness of demonstration, discussion and teacher expository strategies on students' knowledge about Ebola virus disease (F = 67.20, p < 0.05). Therefore the null hypothesis which stated that there is no significant difference in the effectiveness of demonstration, discussion and teacher expository strategies on student' knowledge about Ebola virus disease is rejected. A post hoc analysis was also conducted to establish the direction of the effect observed and the summary of the analysis is presented in table 5.

Table 5 showed the direction of the observed difference in the effectiveness of the strategies which is in favour of demonstration and discussion strategies against teacher expository strategy (demonstration and teacher expository p = 0.000, discussion and teacher expository p = 0.000). The direction of the observed difference in this study confirmed that students learn and perform better when they actively participate in the teaching and learning activities.

Table 4: ANCOVA Summary of the Scores of the Students Taught Ebola Knowledge with the Three Strategies

Dependent Variable: knowledge performance					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	497.136[a]	2	248.568	67.204	.000
Intercept	33975.758	1	33975.758	9185.794	.000
Strategies	497.136	2	248.568	67.204	.000
Error	662.072	179	3.699		
Total	36496.000	182			
Corrected Total	1159.209	181			
a. R Squared = .429 (Adjusted R Squared = .422)					

Table 5: Post Hoc Analysis of the Scores of the Students Taught Ebola Knowledge with the Three Strategies

Dependent Variable: Knowledge Performance, Scheffe						
(I) Instructional Strategies	(J) Instructional Strategies	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Demonstration Strategy	Discussion Strategy	.2520	.36356	.787	-.6455	1.1494
	Teacher Expository Strategy	3. 5631[*]	.32969	.000	2.7493	4.3769
Discussion Strategy	Demonstration Strategy	-.2520	.36356	.787	-1.1494	.6455
	Teacher Expository Strategy	3.3111[*]	.37537	.000	2.3846	4.2377
Teacher Expository Strategy	Demonstration Strategy	-3.5631[*]	32969	.000	-4.3769	-2.7493
	Discussion Strategy	-3.3111[*]	.37537	.000	-4.2377	-2.3846

Based on observed means. The error term is mean square (error) =3.807[*] The mean difference is significant at the 0.05 level

Table 6: ANCOVA Summary of the Scores of the Students Taught Ebola Prevention Skill with the Three Strategies

Dependent Variable: Skill performance

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	27.275[a]	2	13.637	20.776	.000
Intercept	931.291	1	931.291	1418.802	.000
Strategies	27.275	2	13.637	20.776	.000
Error	117.494	179	.656		
Total	1114.000	182			
Corrected Total	144.769	181			

a. R Squared = .188 (Adjusted R Squared = .179)

Just as it was experienced in this study, students taught with the expository strategy do not always have opportunity to participate in the teaching and learning activities, hence may not be able to perform like other students taught with any strategy that gives room for students' participation in the teaching and learning activities. The results also showed no significant difference in the effectiveness of demonstration and discussion strategies (p = 0.787). This indicates that both demonstration and discussion methods have similar value in developing student's knowledge on the subject matter. This could be as a result of the fact that the two instructional strategies gave students opportunities to participate actively in the teaching and learning process.

Ho$_2$: There is no significant difference in the effectiveness of demonstration, discussion and teacher expository strategies on students' handling of Ebola virus disease?

The scores of the students in the experimental and control groups obtained with the use of SEPS were subjected to analysis of covariance (ANCOVA) to determine whether the hypothesis should be rejected or not. This was tested at 0.05 level of significance. The decision role is such that null hypothesis (H$_0$) is rejected if the value of Sig. (2-sided) is less than 0.05. The essence of this hypothesis is to determine effectiveness of demonstration, discussion and teacher expository strategies on students' handling of Ebola virus disease.

From Table 6 the results indicated that there is a significant difference in the effectiveness of demonstration, discussion and teacher expository instructional strategies on students' handling of Ebola virus disease (F = 20.78, p < 0.05). Therefore the null hypothesis which stated that there is no significant difference in the effectiveness of demonstration, discussion and teacher expository instructional strategies on students' handling of Ebola virus disease is rejected. A post hoc analysis was also conducted to establish the direction of the effect observed and the summary of the analysis is presented in table 7.

Table 7: Post Hoc Analysis of the Scores of the Students Taught Ebola Prevention Skill with the Three Strategies

Dependent Variable: Skill Performance, Scheffe						
(I) Instructional Strategies	(J) Instructional Strategies	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Demonstration Strategy	Discussion Strategy	.0883	.15316	.847	-.2898	.4663
	Teacher Expository Strategy	.8438[*]	.13889	.000	.5010	1.1867
Discussion Strategy	Demonstration Strategy	-.0883	.15316	.847	-.4663	.2898
	Teacher Expository Strategy	.7556[*]	.15813	.000	.3652	1.1459
Teacher Expository Strategy	Demonstration Strategy	-.8438[*]	.13889	.000	-1.1867	-.5010
	Discussion Strategy	-.7556[*]	.15813	.000	-1.1459	-.3652

Based on observed means. The error term is mean square (error) =.642[*]The mean difference is significant at the 0.05 level.

Table 7 showed the direction of the observed difference in the effectiveness of the strategies which is in favour of demonstration and discussion strategies against teacher expository strategy (p = 0.000). The results also showed no significant difference in the effectiveness of demonstration and discussion strategies (p = 0.847). As it was aforementioned, the results of the study showed no significant difference in the effectiveness of demonstration and discussion strategies used in teaching the students skills in handling of the deadly disease because the two strategies gave students opportunity to participate actively in the teaching and learning process. This type of opportunity is not provided for the students in the conventional group.

CONCLUSION

Social Studies health related topics can be used to improve students' knowledge and handling of Ebola virus disease in Osun State. It was also concluded that demonstration and discussion strategies are very effective in enhancing students' acquisition of adequate knowledge and skills in handling of Ebola virus disease in the State. Thus education can be used as a tool to control the outbreak and spread of lethal diseases like Ebola virus disease.

Limitation of the Study

This study did not investigate the influence that sex (male, female), school type (private, public) and location (urban, rural) can have on student's knowledge and handling of Ebola virus disease. Also, the study did not collect data on student's retention ability of Ebola virus disease knowledge and handling of Ebola virus disease.

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