



TRAINING PROGRAM FOR MOBILE TEACHERS IN TEACHING SCIENCE

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Article history:	Abstract:
Received: 7 th July 2021 Accepted: 20 th July 2021 Published: 20 th August 2021	The study used a systematic process of instructional design to achieve the different phases in the development of a training program for mobile teachers. The sequential explanatory mixed method of research design and ADDIE model were employed in the development of a training program for Mobile teachers. The five phases of the ADDIE model were used to represent a flexible guideline for building and designing an effective training program. This study looked into the profile of the mobile teachers, the instructional strategies they are familiar with, and the teacher's confidence in the use of inquiry-based learning as a basis for a training program in teaching science for the alternative learning system. There are more male than female mobile teachers in the Schools Division of Pampanga. The Mobile teachers were moderately familiar with the different inquiry-based learning teaching strategies. The mobile teachers had a high level of confidence. However, the confidence of the teachers does not translate to the self-efficacy of the learners on the activities used in inquiry-based learning. The correlation between the profile of the mobile teachers and the instructional strategies and confidence in inquiry-based learning showed no statistical significance. More than half of the mobile teachers have not received training related to teaching science. A training program based on the needs assessment of the mobile teachers was developed, proposed, assessed, implemented and evaluated as an intervention to the training needs of the mobile teachers. Over all the training program was satisfactory to both experts and participants. This study emphasizes the importance of giving careful thought to the design and enhancement of a training program in order to benefit teachers and students. The findings of this study revealed that the mobile teachers need more support in terms of professional development and training.

Keywords: Training Program, Inquiry-Based Learning, Science Teaching

1. INTRODUCTION

Every Filipino has a right to free basic education; however, many Filipinos do not have a chance to attend and finish formal basic education. There are those who dropout from schools due to different external and internal reasons, while some do not even have schools in their communities (Atilano, E. B., Omanito, R. G., Desipeda, C. J., Domingo, C. M., & Garbin, S. L. (2016).

The Philippines has been tagged as one of the countries to have the highest poverty incidence rates in Southeast Asia, 16.7% of the population lived below the national poverty line in 2018 (Asian Development Bank, 2020). Due to lack of educational opportunities, the Out-of-School Children (OSC), Out-of-School Youth (OSYs), and Out-of-School Adults (OSAs) were the most affected by poverty. To help in the alleviation of poverty, Alternative Learning System (ALS) was established to provide all Filipinos the chance to have access and complete their basic education in a way that fits their distinct situations and needs (DepEd, 2016).

The ALS A&E Test formerly the Non-formal Education A&E Test is one of the four components of the ALS A&E (then NFE A&E). It offers the successful test takers certification of learning achievements at two learning levels – Elementary and Secondary – that is comparable to the formal school system. The ALS A&E Tests in both levels are

standardized paper and pencil-based tests and use multiple-choice test and composition writing. The test items are based on the learning competencies of the five learning strands of the ALS Curriculum.

To qualify as a Mobile teacher, one must be a licensed teacher regardless of specialization, a resident of the target community or division, and has the ability to speak a local language (DepEd Order No. 59, series 2012). Mobile teachers are expected to deliver basic education to the students who have various reasons for not being able to attend formal schooling (Department of Education Order No. 013, s. 2019).

The Alternative Learning System has been implemented in the country for almost 20 years. However, records show that only a few succeeded to meet the required competencies for accreditation to be granted equivalent rights like the students completing the elementary and secondary education level in this informal educational system. (Arpilleda, 2019). Despite the efforts to improve the competencies of the learners, it has been reported that in November, 2017, tests showed a low turnout of ALS passers compared to the previous year from 38% to 16.5% for elementary and 57% to 15.6% for Junior High School (ABS-CBN, 2018).

The Department of Education (DepEd) included scientific inquiry in the newly designed K to 12 science curricula as one of the domains of learning science. The enhanced science curriculum was described as inquiry-based and student-centered (Department of Education, 2016). This statement and provision in the curriculum clearly imply that inquiry is prescribed for basic science instruction (Danipog, 2018).

Two decades ago, when the basic education in the Philippines is composed only a total of ten years the curriculum plan does not include teaching methods for the teachers teaching science. Teachers were tasked to use appropriate methodologies and innovative approaches. It was in the interest of the science teachers to employ activities that enhance lifelong and life-wide competencies (International Bureau of Education the Chinese National Commission for UNESCO, 2000) From the old 10-year scheme, Grade 1 to 10, it has been modified to 12 years. Among the different subjects or disciplines, Science is one of the subjects that which undergoes major revisions.

These obstacles, as well as all of the risks associated with implementing inquiry-based learning, show how these will discourage students and teachers from effectively participating in substantive investigations, thus undermining learning (Akhtar & Intazzar, 2012). Capps and Crawford (2013) concluded that teachers skipped the inquiry learning approach in half of the allocated classroom time due to their limited understanding of inquiry-based learning. Such issues arise from teacher-centered classes, which are still common in many Philippine schools, where teachers choose to lecture rather than engage students in stimulating and demanding activities. These dilemmas require relevant approaches to science teaching and learning. (Department of Science and Technology Science Education Institute, University of the Philippines, & National Institute for Science and Mathematics Education Development, 2011).

Science learning has been neglected in the educational system in the Philippines. This is reflected in the low performance of learners not only in the formal schooling but also with the learners in ALS (Tindowen, et al.,2017), (Valeza, N. K., et al.,2017) (Arzadon, M., & Nato, R. ,2015). The reforms in the education and the adoption of K-12 brought changes in the education landscape have introduced changes in the methods of teaching specialized subjects such as science. The K–12 Science Curriculum is learner-centered and inquiry-based, with an emphasis on the use of evidence in explanation construction (Ganeb, Montebon, Napocensia, & Napoca, 2018). Mobile teachers as Science teachers should be able to involve students and communities in social construction by encouraging and assisting them. The Department of Education does not provide a regular informal education program, mobile teachers do not receive adequate funding and support (World Bank, 2018).

The literature revealed that ALS teachers are mostly graduates of Bachelor in Elementary Education and they are beginning teachers (Arpilleda, 2018). The available literature describes the current teaching practices of mobile teachers in teaching as traditional and module and lecture based (Ehora & Guillo, 2018). Studies on alternative learning focus on the learners, and there is a dearth of literature on Mobile Teachers. There is a gap in the need to update and improve the teaching of ALS teachers alongside with the teachers in the formal classrooms also need continuous professional development. Mobile teachers need more training and seminars and updates on the teaching methods and strategy in the Alternative Learning System and other related topics (Igarashi, Acosta, & Tenazas, 2020). Thus, this study looks into the development of a training program for mobile teacher in teaching science.

2. RESEARCH QUESTIONS

This study generally aimed to describe the needs of Mobile teachers in the Schools Division Office of Pampanga in terms of instructional strategies and confidence in inquiry instruction with emphasis in teaching Science as a basis for a training program for Mobile teachers. Specifically, the study sought answers to the following questions:

1. How may the professional qualifications of the respondents be described in terms of:
 - 1.1 age
 - 1.2 sex
 - 1.3 highest educational qualification
 - 1.4 length of service as mobile teacher and
 - 1.5 seminars attended related to Science teaching?
2. How may the need of mobile teachers in terms of instructional strategies employed be described?
3. How may the confidence level of mobile teachers in the use of inquiry-based instruction be described?
4. Is there a significant relationship between the profile of the respondents and their instructional needs?

5. Is there a significant relationship between the profile of the respondents and their confidence level in the use of inquiry-based instruction?
6. Based on the result of needs assessment, what training program may be designed?
7. How may the experts assess the designed training program?
 - 7.1 Content Quality
 - 7.2 Instructional Quality
 - 7.3 Technical Quality
 - 7.4 Other Findings
8. How may the respondents describe the implemented training program in terms of:
 - 8.1 facilitator assessment
 - 8.2 training content assessment
 - 8.3 training support assessment and
 - 8.4 overall satisfaction?

3. MATERIALS AND METHODS

This study employed the use of sequential explanatory mixed method research and developmental research. This study used the sequential explanatory mixed methods design to gather data of mobile teachers, learners and experts' insights through survey and interviews. Qualitative and quantitative methods are both used in a mixed method. The sequential explanatory mixed method research design incorporates quantitative and qualitative approaches in two consecutive phases within one study. (Wipulanusat, W., Panuwatwanich, K., Stewart, R., & Sunkpho, J., 2020). The quantitative method questionnaire survey was conducted in the first, then followed by the qualitative using narrative analysis. The findings from the qualitative data contextualize and enrich findings and increase validity when interpreting the data and generate new knowledge (Bowen, P., Rose, R., & Pilkington, A., 2017). This research went through the five key phases or stages of the ADDIE model.

Phase 1: Analysis The first phase was the analysis of the need's assessment of the mobile teachers. The mobile teachers were asked to take a needs assessment survey. The researcher had the assumption that the mobile teachers facilitate their class using their own instructional strategies and instruction as a result of their previous knowledge from training in college and from other similar trainings. The mobile teachers were the primary respondents to the survey for the need's assessment.

Phase 2: Design. The data and results of the needs assessment were gathered and analyzed. The needs assessment was fundamental in providing data and a basis for the training objectives and establishing the program goals, activities context and rationale or the program. This training program is intended to present renewing pedagogical updates with the aim of improving the teaching profession.

Phase 3: Develop The needs analysis emphasized the relevance of a training program for the mobile teachers and was also useful in establishing the priorities of the training program. A prototype training program for mobile teachers was developed based on their needs on instructional strategies.

Phase 4: Implement The implementation concretizes how and when the evaluation and assessment of the program can be carried out. The implementation plan was coordinated with the Education Program Supervisor for ALS in the Schools Division Office of Pampanga. A proposal plan of the training program and the training matrix of activities was submitted and approved for implementation. The training program was intended for four hours of training online through zoom platform. The training program was implemented to the participants of the study among the mobile teachers in the Schools Division of Pampanga. **Phase 5: Evaluate** Evaluation is important to verify that the program has been carried out as planned. There were experts who were involved in the evaluation of the training program. The experts evaluated the training program in terms of content quality, instructional quality technical quality and other findings. The experts were asked to evaluate the training program using a standard survey used for non-print professional development training material form the Learning Resource Management and Development System of the Department of Education.

This study was conducted in the Schools Division of Pampanga. Out of the two hundred twenty-one (221) Provincial and City Schools Divisions, the Division of Pampanga has 119 schools and is considered a mega school division, compared to other provinces in the region. There are 75 mobile teachers who are assigned to the different towns of the province of Pampanga that cater to strategic locations that require the service of the mobile teachers. The primary respondents of the study were the mobile teachers of the Schools Division Office of Pampanga for the school year 2020-2021, with the assumption of representing the diverse population of the province from highly urbanized, sub-urban and rural areas. The respondents were interviewed and were asked to answer the survey questionnaire. The secondary respondents were selected learners and science teaching experts who served for the purpose of triangulation and content validation respectively. The learners are currently taking up ALS class in their respective community centers, wherein an ALS or mobile teacher is assigned.

The validators consisted of six master teachers in science, one head teacher in science, one science coordinator, one Education program Specialist in ALS, and one Education Program Supervisor in science. The validators are Licensed Professional Teachers and are Master's or Doctoral degree holders.

4. RESULTS AND DISCUSSIONS

1. Professional qualifications of the respondents be described in terms of:

1.1 Age

The average age is 41.70 years old. The results were similar to the study on the profile of the ALS implementers in DepEd Cotabato Division where the results showed similar group age that the mobile teacher population in Cotabato were also mostly middle aged around 35-50 years old (Moleño, 2019, p. 7)

1.2 Sex

Out of the 73 respondents 42.47% are females and 57.53% or more than half of the respondents are males. Despite the teaching profession as being a female-dominated profession, the mobile teachers of the Schools Division of Pampanga are male dominated.

1.3 Educational qualification

majority of the mobile teachers are bachelor's degree holders. There were more mobile teachers that have only minimum qualifications, 43.84 or 32 of the respondents had completed their master's degree while the remaining 56.16% or 41 had their bachelor's degree.

1.4 Length of service as mobile teacher

In terms of length of service, the mobile teachers were mostly experienced teachers. 21.92% of the respondents have been teaching and, in the service, mostly for 22-25 years. There were also newbie teachers, 9.59% or 7 of the mobile teachers were starting their career in teaching and have been teaching for 1-3 years.

1.5 Seminars attended related to Science teaching

A resounding 87.67% or 64 of the mobile teachers reported that they have not attended science related trainings. There were only 9 or 12.3 % of the mobile teachers who have claimed to have received previous training in teaching science. Out of 73 respondents, 64 or 87.7% answered "No" when asked if they have participated and/or attended in any science related trainings, workshops and seminars.

2. The need of mobile teachers in terms of instructional strategies

The overall mean score of the mobile teachers' response on structured inquiry of 3.85 can be described as moderately familiar. The total physical response was the modestly familiar instructional strategy for structured inquiry with a mean of 3.64 and a verbal description of moderately familiar. The overall mean score of the mobile teachers' responses for the confirmation inquiry of 3.84 can be described as moderately familiar. The "cloze activities with a mean score of 3.49" teaching strategy was the modestly familiar instructional strategy for confirmation inquiry with a mean score of 3.68 and a verbal description of moderately familiar. The overall mean score of the mobile teachers' responses for the guided inquiry of 3.84 can be described as moderately familiar. The "Pull out and talk and write" teaching strategy was the modestly familiar instructional strategy for guided inquiry with a mean score of 3.60 and a verbal description of moderately familiar. The overall mean score of the mobile teachers' responses for the open inquiry of 3.84 can be described as moderately familiar. The mobile teachers were modestly familiar with the thinking maps which make use of common visual language for transferring thinking processes with a mean score of 3.74 and a verbal description of moderately familiar.

3. The confidence level of mobile teachers in the use of inquiry-based instruction

The mobile teachers have moderate to high level of confidence in the use of inquiry-based instruction in their class for the alternative learning system. The item with the highest mean score statement 7 is with a mean score of 4.42 "I believe that I enable the student to share emotions, feelings, ideas, and opinions." The item with the lowest mean score is statements number 31 "I believe that I enable the student to have a mental representation of a task." with a mean score of 3.77. The overall results for the level of confidence of the mobile teachers in the use of inquiry-based learning has a mean score of 4.05. This can be described and interpreted to as high level of confidence. The learners confirmed one of the items on the high level of confidence of the mobile teachers, when they are asked if they "can explain the meaning of statements diagrams and graphs." However, most of the items were answered by the learners with neutrality. This questions the self-reported confidence of the mobile teacher in terms of the type of activities they are presenting to the learners for the Learning Strand 2: Scientific Literacy and Critical Thinking. The learners were able to confirm one of the items on the high level of confidence of the mobile teachers, when they were asked if the teacher asks them questions. The learners agreed to this item and confirmed the mobile teachers asks questions to the learners which is an essential and component skill for inquiry-based learning. However, most of the items were also answered by the learners with neutrality. The confidence level of the mobile teachers does not reflect on the response of the learners in terms of classroom culture. The overall mean of the learners' response in terms of classroom culture is at 3.21 or and can be given a "neutral" description. The learners' overall mean score for their self-efficacy on the use of inquiry-based learning is at 3.05 with a verbal description of neutral. A neutral response suggests that the interaction intended for independent learning may not have created a direct impression to the learners. The confidence level of the mobile teachers does not reflect on the responses of the learners in terms of the learner's self-efficacy.

4. The relationship between the profile of the respondents and their instructional needs

The data analysis reveals that instructional strategies of the mobile teachers showed no statistical significance when correlated with the profile. Hence, the null hypothesis is accepted for the correlation of the mobile teacher's

profile and instructional strategies. The data suggest that there is no significant relationship with the variables in question.

5.The relationship between the profile of the respondents and their confidence level in the use of inquiry-based instruction

The data analysis reveals that confidence level of the mobile teachers showed no statistical significance when correlated with the profile. Hence, the null hypothesis is accepted for the correlation of the mobile teacher's profile and confidence level. The data suggest that there is no significant relationship with the variables in question.

6. Training program may be designed based on the result of needs assessment

Majority of the mobile teachers reported not having any sort or form of professional development or training in Science. The mobile teachers' familiarity with the instructional strategies used in IBL can be described as moderately familiar. Therefore, the instructional strategies of the mobile teachers in which they were modestly familiar with could be included in the training program. Specifically, these are the following: Total Physical Response for the structured inquiry, Cloze Activities/Sentence for the confirmation inquiry, Pull Out and Talk/Write for the guided inquiry and the use of Thinking Maps for open inquiry. The mobile teachers have moderate to high level of confidence in the use of inquiry-based instruction in their class for the alternative learning system. The average mean for the level of confidence is 4.05 which translates to very high level of confidence. The top three claims with the lowest mean score are 31, 28, and 5. These items were considered in the design and development of the training program. The item with the lowest mean score for the confidence of the mobile teacher in the use of IBL is item number 31 "I believe that I enable the student to have a mental representation of a task" with a mean score of 3.77. The training included the use of mind maps, which provide activities that include a shared visual language for transferring thought processes, incorporating learning, and evaluating progress to address mental representations. The item with the second lowest mean score for the confidence of the mobile teacher in the use of IBL is item number 28 "I believe that I enable the student to anticipate and respond to arguments in opposition to one's view." with a mean score of 3.82. To help out the mobile teacher to address learners' anticipation and response to arguments, the training included the use of "Cloze Activities" which use written text in which certain words are left out and blanks are inserted. And item with the third lowest mean score is statement item number 5 with 3.84 "I believe that I enable the student to restate or reformat the problem." The pull out and write activity, which is a technique that guides students to participate in prolonged oral discourse by communicating with other learners, will be included in the training program.

7. Expert's assessment of the designed training program

7.1 Content Quality

The experts gave the training a passing score for content quality with a mean score of 3.70 within the range of very satisfactory description. The item with highest mean of 3.90 is item number nine (9) Content is free from cultural, gender, racial, or ethnic bias. And the item with the lowest mean of 3.50 is item number four (4) Content is up to date. The expert gave the training a passing score for content quality with a mean score of 3.70.

7.2 Instructional Quality

The overall mean score for instructional quality is 3.64 which also have a description of very satisfactory. The item with highest mean of 3.90 is item number two (2) Material achieves its defined purpose. And the item with the lowest mean of 3.50 is item number four (4) Material effectively stimulates creativity of target user. The training was also evaluated in terms of technical quality.

7.3 Technical Quality

The evaluators gave the training material a passing score for technical quality. The overall mean score for technical quality is 3.52 which also have a description of very satisfactory. The item with highest mean of 3.80 is item number seven (7) The material can easily and independently be used.

7.4 Other Findings

The evaluators gave the training material a passing score for other findings. The overall mean score for the other findings is 3.80 which also has a description of very satisfactory. This also indicates that the training program material passed the evaluation for other findings criteria.

8. Respondents' description of the implemented training program in terms of:

8.1 Facilitator assessment

The overall mean score of the facilitator assessment was at 4.44 which can be verbally described as satisfactory. The respondents were most pleased by the Academic proficiency of the instructor with a mean score of 4.63 or a description of "very satisfied."

8.2 Training content assessment

The overall mean score of the training content was at 4.46 which can be verbally described as satisfactory. The respondents rated the training content highest on the "quality of teaching in the training course" with a mean score of 4.50 which has a verbal description of very satisfied.

8.3 Training support assessment

The overall mean score of the training support is at 4.3 which can be verbally described as satisfied. The respondents were most satisfied with the "treatment of authorities/organizers toward the participants" in the training with a mean score of 4.52 which has a verbal description of very satisfied.

8.4 Overall satisfaction

The respondents' overall satisfaction can be described as satisfied. The respondents were satisfied with the quality of the training program workshop and were also satisfied on the way of conducting the workshop. The respondents' overall satisfaction of can be described as satisfied.

5. CONCLUSIONS

Based on the findings of the study, the following conclusions were drawn:

1. There are more male than female mobile teachers in the Schools Division of Pampanga. Most mobile teachers for the school year 2020-2021 belong to the middle age. Most of the mobile teachers do not pursue graduate school and majority have not received science related training. There are more male mobile teachers, primarily due to safety concerns and with the challenging nature of the job which require visiting and travelling to off road, destinations by crossing rivers, unpaved roads and rough terrains in remote and rural communities where the community learning centers are located.

2. Mobile teachers were moderately familiar with the different inquiry-based learning teaching strategies. They were modestly familiar with the following strategies for each IBL type, total physical response for structured inquiry cloze activities for confirmation strategy, pull and talk and write for guided inquiry, thinking maps for open inquiry.

3. The level of confidence of the mobile teachers in the use of inquiry-based learning was described as high level of confidence. However, the confidence of the teachers does not translate to the self-efficacy of the learners on the activities used in inquiry-based learning as the learners reported that their self-efficacy was with a degree of neutrality. The results suggests that the mobile teachers' instructions do not create significant impressions to the learners.

4. The correlation between the instructional strategies and profile of the mobile teachers showed no statistical significance. The results raise potential new variables that can be considered and new questions for future researchers to explore

5. The correlation between the confidence on the use of inquiry-based learning and profile of the mobile teachers also showed no statistical significance. The results raise potential new variables that can be considered and new questions for future researchers to explore.

6. More than half of the mobile teachers have not received training related to teaching science. The instructional strategies in which the mobile teachers fared modestly were included in the training program. Total Physical Response for the structured inquiry, Cloze Activities Sentence for the confirmation inquiry, Pull Out and Talk/Write for the guided inquiry and the use of Thinking Maps for open inquiry. The items in which the mobile teachers' moderate degree of confidence in the usage of IBL were taken into account when the training program was designed and developed. It can be concluded that the long-term training and support can be extended to the mobile teachers.

7. Through the use of the Learning Resource Management System Evaluation Rating Sheet for Professional Development Materials, the experts assessed the training program with a very satisfactory rating on all the four components of the evaluation for content quality, instructional quality, technical quality and other findings.

8. Using the Kirkpatrick's 1st level of assessment for training program, the respondents evaluated the training program in terms of facilitator, assessment, training content assessment, training support assessment and overall satisfaction with a satisfactory rating. Overall satisfaction experience of the respondents can be described verbally as satisfactory. The expectation of the respondents was met in the conduct and implementation of the training program.

6. RECOMMENDATIONS

In the light of the above conclusions, the researcher hereby offers the following recommendations:

1. Mobile teachers may attend or pursue graduate studies, trainings and professional development to further improve their teaching strategies. Specialization and education qualifications may be considered depending on the teacher's profile and population in hiring mobile teachers to create a pool of diverse subject experts among mobile teachers for possible tandem and team-teaching approach.

2. Proficiency in a certain instructional strategy requires time, practice and exposure. The mobile teachers were moderately familiar with the instructional strategies. The mobile teacher may initiate and propose the conduct of a deep dive specialized training that will focus on the modestly familiar inquiry-based teaching strategies. The

specialized training will improve their familiarity with the various strategies used for inquiry-based learning and will eventually lead to practice. Specific and specialized strand for ALS should be taught by an ALS teacher with specialization on that subject.

3. Mobile teachers have high level of confidence in the use of inquiry-based learning. This should also translate to the learners. The mobile teachers as advocates of distance and modular learning should encourage ALS learners to be independent learners as the prescribed mode of learning delivery in ALS in through Self-Learning Modules and distance learning. The confidence of the mobile teachers may be sustained by attending regular in-service training and sharing of best practices.

4. The instructional strategies and the profile of the mobile teachers have no correlation and significance. Other studies may venture to look into possible variables that may be correlated to the instructional strategies of the mobile teachers.

5. The confidence in the use of inquiry-based learning and the profile of the mobile teachers showed no statistical significance. Other studies may venture to look into possible variables that may be correlated to the instructional strategies of the mobile teachers.

6. Most of the learners in the Alternative Learning System are young adults. The mobile teachers catering to them are mostly elementary teachers by field of specialization which mismatches the competencies and the learning needs of the learners. The misalignment of teacher's specialization in the hiring and selection of mobile teachers provides an opportunity in the creation of policy and program of Higher Education Institutions to train aspiring teachers in the delivery learning of the alternative learning system. It is not only the learning modality of the learners that has evolved and changed overtime. The learning and training needs of teachers especially mobile teachers also need to be updated. Similar distance training may be further proposed to keep up with the changes of how the teaching profession advances and progress.

7. The implemented training program may be subject for further evaluation by the Division Office or the DepEd Central Office Material Resource Evaluation team for a more in-depth evaluation and assessment. The content of the training program may be further improved and be integrated in virtual In-Service Training (INSET) for teachers through official DepEd training platforms sites such as the DepEd Learning Management System Portal.

8. This study emphasized the importance of giving careful thought to the design and enhancement of a training program in order to benefit teachers and students. It is suggested that a thorough investigation on the implications and impact of the conducted training program to the mobile teachers may be conducted.

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