

# INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY: APPLIED BUSINESS AND EDUCATION RESEARCH

2021, Vol. 2, No. 1, 1 – 7

<http://dx.doi.org/10.11594/ijmaber.02.01.01>

---

## Research Article

### Mode of Response Students' Engagement (MORSE): Basis for Improving Science Performance of Students

Eleazer T. Arzadon

James L. Gordon Integrated School

---

#### Article history:

Submission January 2021

Revised January 2021

Accepted January 2021

#### \*Corresponding author:

E-mail:

[eleazer.arzadon@deped.gov.ph](mailto:eleazer.arzadon@deped.gov.ph)

#### ABSTRACT

In educational system, just like in a classroom setting, there is a degree or sense of uncertainty or ambiguity on how teaching-learning process will take place. It is the duty and responsibility of the teacher to structure the classroom in maximizing students learning by engaging in all modalities such as hearing, visual, olfactory, kinesthetic and gustatory. Moreover, by bringing students together in the classroom to produce group interaction that facilitates learning in different individuals.

I, the Researcher, had facilitated an active learning through the use of Mode of Response for Students Engagement (MORSE). Intervention was the use of personalized card, dyad, work cell group and random calling conducted twice a week for the duration of the 1<sup>st</sup> grading period. The 29 respondents from experimental group were subjected to MORSE and 29 respondents from control group were given traditional classroom engagement. The proponent sought to answer the following research questions: What was the effect on the academic performance of the students who were subjected to MORSE? Was there a significant difference in the pre-test and post-test result using the traditional method and of the MORSE method? Lastly, what was the implication of MORSE method in teaching Earth Science among grade 10 students?

The collected data of pre-test and post-test results were gathered and treated using paired sample t-test of difference and mean. Sample paired t-test result showed that the computed t value of 7.45 is greater than the t critical value of 1.701 at level of significance of 0.05. There is significant difference on the post test result between the control group and experimental group. The Experimental group, who were subjected to MORSE techniques achieved higher post-test than the control group. Based from the analysis gathered, MORSE methods is highly effective as means of engaging students to actively participate and improve academic performance in Earth Science. Therefore, I, the proponent recommended the use of MORSE in classroom

---

#### How to cite:

Arzadon, E. T. (2021). Mode of Response Students' Engagement (MORSE): Basis for Improving Science Performance of Student. *International Journal of Multidisciplinary: Applied Business and Education Research* 2(1): 1–7.  
doi: 10.11594/ijmaber.02.01.01

activities. Likewise, teachers can make use other MORSE techniques or devices to facilitate active learning in the classroom for whole class engagement.

*Keywords:* Active learning, Performance, Response

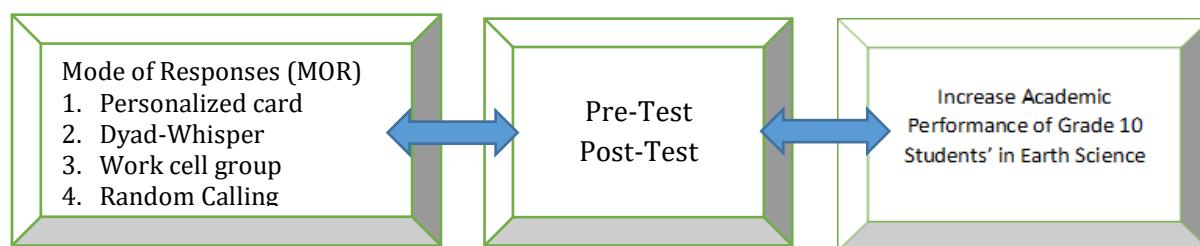
## Introduction

### *Rationale and Review of Related Literature*

The active learning process can be illustrated by a Chinese proverb “tell me and I will forget, show me and I will remember, involve me and I will learn”. As a science teacher, there is a great emphasis on my time and energy on the matter of “what” my students should be learning in the competencies of science primarily in grade 10 and then looking to which students are acquiring learning competencies. Additionally, Tanner (2013) asserted that “there has been increased focus over time on the “how” of teaching, with attention to questioning the efficacy of traditional lecture methods and exploring new teaching techniques to support students in more effectively learning the “what” of science”. Science education is extremely important and this knowledge contrib-

utes to the development of a well-rounded individual. Science is a part of everyday life and, thus, it is vital for students to have sufficient background knowledge (Hallez, 2008, p.6). The Department of Education most innovative approach stated in the national policy for science education is anchored in a constructivist framework. Constructivist approach in teaching at all levels of school is needed because the conventional pedagogical practices of teaching emphasize learning of answers more than exploration of questions, memory at the expense of critical thought, bits and pieces of information instead of understanding the context, reading in lieu of doing i.e, not efficient to achieve the objectives of teaching science as prescribed in NCF-2005 (Singh & Yaduvanshi, 2015). Finally, bringing together individual students in classrooms produced group interactions that supported learning for different individuals.

### *Conceptual Framework*



### *Research Questions*

This action research aimed to use mode of responses in determining its effects on the academic performance of grade 10 students in Earth Science. Specifically, the researcher sought to answer the following questions:

1. What is the effect on the academic performance of the students who are subjected to MORSE?
2. Was there a significant difference on the pre/post test result on the traditional method and MORSE method?

3. What was the implication of using MORSE method in teaching Earth Science among Grade 10 Students?

### *Hypotheses*

- Ho: There was no significant difference in the academic performance of Students' subjected to MORSE Methods.
- Ho: There was no significant difference on the pre/post results of the traditional method and MORSE.

### **Significance of the Study**

Getting all your students focused, eager, and on task at the beginning of class is challenging enough. Equally problematic, once you have them locked in to the lesson, was watching them zone out. There was nothing unusual about that. After all, anyone who had to sit through a long routine -- including a teacher's presentation -- has been bound to drift off at some point (Frondeville, 2009).

The whole landscape for classroom management and teaching can be changed using the mode of response (MORSE) techniques. The proponent had used the full space of the room to facilitate active involvement among all the students. Mode of response was initiated before the class starts. The students did not have to guess how they would respond. The strategy is to use MORSE method before, during and after the class discussion. Using the MORSE before posing the question, the teacher created a safe situation in which all students may respond. When MORSE is not one student may be answering, all listening, higher learning had occurred. Blogger Ben Johnson (2012) defines student engagement and describes what it looks like in the classroom: You will see students paying attention (alert, tracking with their eyes), taking notes, listening (as opposed to chatting, or sleeping), asking questions, responding to questions (whole group, small group, four corners, Socratic Seminar), following requests (participating, Total Physical Response (TPR), storytelling, Simon Says), reacting (laughing, crying, shouting, etc.)

### **Scope and Limitations**

The main purpose of this study centers on the use of mode of responses such as Personalized card, Dyad-Whisper, Work cell group and Random Calling in increasing students engagement, thus, involving them thoroughly on the teaching-learning process. Data collection had been limited on the pre-test, post-test. It is limited on the time period of the 1<sup>st</sup> grading period. This study has been conducted at Olongapo City National High School from June to October 2017.

### **Method**

### **Type of Research**

Action research strategy's purpose is to solve a particular problem and to produce guidelines for best practice (Descombe, 2010). Furthermore, a succinct definition of action research appears in the workshop materials we use at the Institute for the Study of Inquiry in Education. That definition states that action research is a disciplined process of inquiry conducted by and for those taking the action. The primary reason for engaging in action research is to assist the "actor" in improving and/or refining his or her actions (Sagor, n.d.).

In Schools, action research refers to a wide variety of evaluative, investigative, and analytical research methods designed to diagnose problems or weaknesses—whether organizational, academic, or instructional—and help educators develop practical solutions to address them quickly and efficiently. Action research may also be applied to programs or educational techniques that are not necessarily experiencing any problems, but that educators simply want to learn more about and improve. The general goal is to create a simple, practical, repeatable process of iterative learning, evaluation, and improvement that leads to increasingly better results for schools, teachers, or programs (Education Reform, 2015).

### **Respondents and Sampling Method**

The participants were selected in Grade 10 coming from Special Program in the Arts (SPA) with 15 boys and 14 girls and Special Program in Sports (SPS) 13 boys and 16 girls with a total of 58 students. The MORSE has been used twice from week for the whole duration of the 1<sup>st</sup> periodical period.

### **Instrument/Intervention Program**

There were four MORSE the proponent used and these are:

#### 1.) Personalized Card

The card is made up of hard board with a size of 2 by 8 inches and covered with red on one side and green on the other side. This board has been used when the question being asked by the teacher was answerable by "Yes" or "NO". The green colored side has been raised if the answer was "YES" and red was lifted if the answer

was "NO". This concept has been associated with the traffic signs for students to learn the basic laws of stopping and walking through the pedestrian lane. Thus, the color GREEN is GO and color RED STOP.

2.) Dyad-Whisper

Students were given questions specifically to extract their ideas about certain topic and talk with pre-assigned second dyad. Personalized card is on a cup and teacher picked one card for which the selected student discussed what they have talked in their dialog.

3.) Work cell group

Students were divided into 6-8 members depending on the size of the class. The concept of the clustering was to share with one another, to flush-out, refined and combined with a model the teacher has presented on a different topic and made outputs to be discussed in the class by a student that was picked in the cup of cards.

4.) Random calling

In the classroom, having a cup, teacher collected personalized card information from each student. The cards served two purposes: 1) to enable teacher to get to know students and 2) to developed alertness.

On the other hand, all students have made at least a journal of what they have learned on that day. Kay Burke, author of *How to Assess Authentic Learning*, states: "Journal writing provokes more reflection and encourages students to take charge of their learning and their feelings. Journals help students make connections between what is really important to them, the curriculum, and the world". Journaling is also a way for teachers to learn more about their students. According to *Language Connections: Writing and Reading Across the Curriculum*, "Journal writing works because every time a person writes an entry, instruction is individualized." The book also states, "The journal records the student's individual travel through the academic world." Journals are a great assessment tool for teachers! They reveal the students' level of comprehension, as well as what

students require in order to improve problem areas.

**Data Collection Procedure**

The proponent has used 50 points pre-test which were given at the start of first grading period and post-test before the periodical examination to quantify the knowledge learned in the class. More specifically, the tests indicated how the students are learning with MORSE techniques. The data targeted students acquiring more concepts learned and identified that MORSE is a method to be fully implemented and adapted. The study commenced on June 20, 2017 and ended on August 15, 2017. Unit 1 first grading period for grade 10 was Earth science and the following modules and instructional activities have been discussed:

Module 1: Plate Tectonics

- Activity 1: Find the center
- Activity 2: Let's mark the boundaries
- Activity 3: Head on Collision
- Activity 4: Going separate ways
- Activity 5: Slide and Shake
- Activity 6: Drop it like Hotspot

Module 2: The Earth's Interior

- Activity 1: Amazing waves
- Activity 2: Our dynamic earth
- Activity 3: Let's fit it!
- Activity 4: Drifted continent's
- Activity 5: Split and separate
- Activity 6: How fast does it go!
- Activity 7: Push me and aside!

**Data Analysis**

I considered a randomized, controlled experiment in which measurements were made before and after the treatment. One way around the problem was to compare the group of differences between pre-test and post-test, sometimes called change scores or gain scores. The proponent used paired sample t-test of the differences to compare two population means the case of two samples which is the control group and experimental group are correlated.

**Results and Discussion**

Table 1, Mean Score of Experimental Group in their pre-test and post-test result. It was

gleaned on the table the pre-test mean score of 18.06 and post-test mean score of 38.76 has significantly increased the mean score of Experimental Group by 20.70.

Table 1. Difference between Pre-test and Post-test Performance of the Experimental Group

Parameters	N	$\bar{x}$	Delta( $\Delta$ )	$\Sigma D$	$\Sigma D^2$
Pre-Test	29	18.06	20.70	242	3032
Post-test	29	38.76			

Table 2 displays the computed t value of 11.21 is greater than the t critical value of 1.701 at level of significance of 0.05, the statistical decision is to reject the null hypothesis. There is a significant difference between the pre-test and post-test of the respondents who were subjected to MORSE. Result implied that there is enough evidence to support that the claim that MORSE can effectively improve the academic performance of the respondents.

Table 2. Paired T-test value @ 0.05 level of significance on the Pre-test and Post-test of the Experimental Group.

Parameters	N	$\bar{x}$	Df	$\Sigma D$	$\Sigma D^2$	t-value		Remarks
						comp	Tab	
Pre-test	29	18.06	28	598	12352	11.21	1.701	Ho Rejected
Post-test	29	38.76						

Table 3, Mean Score Control Group in their pre-test and post-test result. It can be observed on the table the pre-test mean score of 16.55 and post-test mean score of 30.41 has significantly increased the mean score of Control Group by 13.86.

Table 3. Difference between Pre-test and Post-test Performance of the Control Group

Parameters	N	$\bar{x}$	Delta( $\Delta$ )	$\Sigma D$	$\Sigma D^2$
Pre-Test	29	16.55	13.86	402	6552
Post-test	29	30.41			

Table 4 exhibits the computed t value of 13.22 is greater than the t critical value of 1.701 at level of significance of 0.05, the statistical decision is to reject the null hypothesis. There is significant difference between the pre-test and post-test of the respondents who were not subjected to MORSE. Since teaching was conducted by the teacher with the same materials but different approach it is likely that learning will take place in the controlled group. Dr. Lee Becker in his studies postulated that those procedures were used to analyze the differences in the post test scores after the pre test scores differences were held constant.

Table 4. T-test value @ 0.05 level of significance on the Pre-test and Post-test of the Control Group.

Parameters	N	$\bar{x}$	Df	$\Sigma D$	$\Sigma D^2$	t-value		Remarks
						comp	Tab	
Pre-test	29	16.55	28	402	6552	13.22	1.701	Ho Rejected
Post-test	29	30.41						

Table 5 Mean Score of Experimental Group and Control Group in their pre-test result. It can

be noted on the table the pre-test mean score of Control Group is 16.55 while Experimental Group has a mean score of 18.06. The Experi-

mental Group has slight stock knowledge compared with the Control Group with a difference of 1.51 more correct answers.

Table 5. Difference in the Pre-test Performance of the Experimental Group and Control

Parameters	N	$\bar{x}$	Delta( $\Delta$ )	$\Sigma D$	$\Sigma D^2$
Control	29	16.55	1.51	46	126
Experimental	29	18.06			

Table 6 exposes the computed t-test value of 6.36 is greater than the t critical value of 1.701 at level of significance of 0.05. Thus, the null hypothesis is rejected. There is significant difference between the pre-test score of the

Experimental group and Control Group. The Control Group had a slight stock knowledge in Earth Science with a mean score of 1.51 correct answers.

Table 6. T-test value @ 0.05 level of significance on the Post-test of the Experimental Group and Control Group.

Parameters	N	$\bar{x}$	Df	$\Sigma D$	$\Sigma D^2$	t-value		Remarks
						comp	Tab	
Control	29	30.41	28	46	126	6.36	1.701	Ho Rejected
Experimental	29	38.76						

Table 7 Mean score of Control Group versus Experimental Group in their post-test result. It can be seen on the table the post-test mean score Control Group of 30.41 and

Experimental Group post-test mean score of 38.76. The Experimental Group has significant edge of mean score of 8.35.

Table 7. Difference in the Post-test Performance of the Experimental Group and Control Group

Parameters	N	$\bar{x}$	Delta( $\Delta$ )	$\Sigma D$	$\Sigma D^2$
Control	29	30.41	8.35	242	3032
Experimental	29	38.76			

Table 8 reveals the computed t-test value of 7.45 is greater than the t critical value of 1.701 at level of significance of 0.05. Thus, the null hypothesis is rejected. There is significant difference between the post test score of the Experi-

mental group and Control Group. The Experimental Group who were subjected to MORSE method achieved greater post test result than the control group with significant increase of mean score of 8.35.

Table 8. T-test value @ 0.05 level of significance on the Post-test of the Experimental Group and Control Group.

Parameters	N	$\bar{x}$	Df	$\Sigma D$	$\Sigma D^2$	t-value		Remarks
						comp	Tab	
Control	29	30.41	28	242	3032	7.45	1.701	Ho Rejected
Experimental	29	38.76						

## Conclusion

Based on the foregoing results and discussions, there is a significant difference on the mean score of control group and experimental group in post test result. The Experimental group, who were subjected to MORSE techniques achieved higher post-test than the control group.

## Recommendation

1. Based from the analysis gathered by the proponent, the use of MORSE in teaching is highly effective in improving the academic performance of students in Earth Science. Therefore, I, the proponent recommends the use of MORSE in classroom activities.
2. Teachers may use other MORSE techniques or devices to facilitate active learning in the classroom for whole class engagement participation.

## References

- Acosta H. D., et. al, 2015, Science Learner's Material, Grade 10, REX Bookstore
- Acosta H. D., et. al, 2015, Teacher's Guide , Grade 10, REX Bookstore
- Briggs S. Action Research: The Ultimate Problem-Solving Strategy for Educators. Retrieved <https://www.opencolleges.edu.au/informed/features/action-research/>
- Denscombe M. (2007) The Good Research Guide: For Small-Scale Social Research Projects. Retrieved [https://www.researchgate.net/publication/279187534\\_The\\_Good\\_Research\\_Guide\\_For\\_Small-Scale\\_Social\\_Research\\_Projects\\_Education\\_Forum\\_\(2015\)\\_Action\\_Research](https://www.researchgate.net/publication/279187534_The_Good_Research_Guide_For_Small-Scale_Social_Research_Projects_Education_Forum_(2015)_Action_Research)
- Research Retrieved <https://www.edglossary.org/action-research/>
- Fronzoville, T. (2009) How to Keep Kids Engaged in Class. Retrieved <https://www.edutopia.org/classroom-student-participation-tips>
- Johnson (2012), How Do We Know When Students Are Engaged? Retrieved <https://www.edutopia.org/blog/student-engagement-definition-ben-johnson>
- Posner G. J., Strike K. A., Hewson P. W., Gertzog W. A. Accommodation of a scientific conception: towards a theory of conceptual change. *Sci. Educ.* 1982;66:211-227. [Google Scholar]
- Sagor (n.d.) Guiding School Improvement with Action Research. Retrieved <http://www.ascd.org/publications/books/100047/chapters/What-Is-Action-Research%20A2.aspx>. Schweighofer J. (n.d) The Benefits of Journaling in the Classroom Retrieved <https://upub.net/blog/the-benefits-of-journaling/#:~:text=Journals%20help%20students%20make%20connections,curriculum%20and%20the%20world.%E2%80%9D&text=It%20also%20gives%20students%20time,to%20participate%20in%20classroom%20discussions.>
- Singh & Yaduvanshi (2015), Constructivism in Science Classroom: Why and How. Retrieved <http://www.ijsrp.org/research-paper-0315/ijsrp-p3978.pdf>
- Tanner K. (2013) Structure Matters: Twenty-One Teaching Strategies to Promote Student Engagement and Cultivate Classroom Equity. Retrieved <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3762997/>