Utilization of the Modified Frayer Model and Semantic Map its Influence on Motivation Towards Science

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This research study was conducted to examine the influence of utilization of the Modified Frayer Model and Semantic Map graphic organizers on the motivation towards Science of Grade 7 students in Sarangani Province, Philippines. The study included 100 students who were grade 7 students who participated in the study by joining the Science class and completing the online survey. To assess the influence of utilizing the Modified Frayer Model and Semantic Map graphic organizers on the motivation of the students toward Science subjects, the study utilized the survey questionnaire about motivation towards science and compared the motivation of the control and experimental groups before and after giving instructions conventional mode of teaching and utilization of Modified Frayer Model and Semantic Map graphic organizers, respectively. This study aims to describe the motivation towards Science of the subjects, find out the difference of the subject and the control group, examine the difference in the motivation towards Science of the subjects and Ascertain the difference in the motivation towards science of the subjects and the control group. The study utilized a quasi-experimental research design. Quasi-experimental research designs, like experimental designs, test causal hypotheses. This study used a quasi-experimental research design where two experimental subjects will be tested. The experimental subjects will be assessed on their Science 7 motivation through the utilization of the Modified Frayer Model and Semantic Map. Upon the analysis with the use of an independent sample t-test on the mean of the control group motivation toward science before and after receiving the conventional mode of teaching, it was discovered that the motivation of the subjects towards science insignificantly did not improve after receiving the conventional mode of teaching in Science. This seemed to suggest that the conventional way of teaching is not effective in improving student subject's motivation toward science. Maybe because the traditional methods of teaching revolve around the lecture. In this case, the teacher is dominant and plays the role of a knowledge transmitter while students are passive. This probably quickly makes one lose interest. As the students do not actively put together their understanding, they may fail to interact and therefore undergo no hands-on experience. Furthermore, this study recommends, to utilize the Modified Frayer Model and semantic map teaching techniques in promoting the adoption of an active learning strategy and enhancing student engagement and motivation in science. Students can easily grasp and apply the various scientific principles by using these visual aids. This helps positive and constructive critique to improve student's understanding and critical capacities that improve their motivation. This can be achieved regularly through assessments, individual feedback, and an opportunity for self–reflection on the part of students.

Keywords: Modified Frayer Model, Semantic Map, Graphic Organizers, and motivation toward Science

INTRODUCTION

Motivation is to engage students themselves actively in science education which leads to their successful participation. It is prudent for educators to understand what motivates students towards science since this will enable them to develop targeted teaching approaches as well as intervention programs that could be used for creating positive teaching practices and results. A myriad of elements may act to motivate students' science inclinations. They include intrinsic motivation, self-determination, self-efficacy, career motivation, grades motivation, supportive learning environment, innovative technologies, parental involvement, and exposure to science education at an early age These issues educators should have in mind while designing instructional

strategies and interventions that will motivate students' participation in science education.

The Frayer Model and Semantic Mapping as instructional strategies on student motivation at the level of science education. Frayer model is an illustration tool that shows what a new vocabulary word is all about to help the students remember the same. However, Semantic Mapping is a tactic designed to link words to ideas by depicting visual associations. One of the significant factors affecting student outcomes in science education. Students' motivation to engage in science learning is influenced by factors like performance goals, achievement goals, self-efficacy, active learning strategies, and stimulation of the environment. The teachers are vital in encouraging students' motivation toward studies through the application of appropriate teaching methods, as well as the development of a positive classroom climate. Investigating how students' motivation can improve performanceand increase the depth of learning science concepts.

The perception of science as valuable is important for motivation in science learning. Likewise, mastery-goal students have a desire to enhance their knowledge and skills which could result in high achievement scores among science learners (Mupira & Ramnarain, 2018). However, students pursuing performance goals focusing on demonstrating competence and surpassing others can also be motivated; yet their emphasis on competition does not always result in profound understanding and lifelong learning (Aque et al., 2021; Grinnell et al., 2018).

Objectives of the study

This study aimed to investigate the influence of modified Frayer Model and SemanticMap graphic organizers on the student's attitude towards Science of the Grade 7 students in Alabel National High School, Sarangani Philippines during the School Year 2022-2023. Specifically, this study tried to:

1. Describe the motivation toward Science of the subjects in the experimental and control groups before and after receiving the conventional mode of teaching and instructions utilizing the modified Frayer model and semantic map graphic organizers;
2. Find out the difference in the motivation toward Science of the subjects in the control group before and after receiving the conventional mode of teaching;
3. Examine the difference in the motivation toward Science of the subjects in the the experimental group before and after receiving instruction utilizing the modified Frayer model and semantic map graphic organizers;
4. Ascertain the difference in the motivation toward Science of the subjects in the control and experimental groups after receiving the conventional mode of teaching and instruction utilizing the modified Frayer model and semantic map graphic organizers;

Research Design

The study utilized a quasi-experimental research design. Quasi-experimental researchdesigns, like experimental designs, test causal hypotheses. Quasi-experimental designs identify a comparison group that is as similar as possible to the treatment group in terms of baseline (pre-intervention) characteristics (White & Sabarwal, 2014). This study used a quasi-experimental research design where two experimental subjects will be tested. The experimental subjects will be assessed on their Science 7 motivation through the utilization of the Modified Frayer Model and Semantic Map. It is a form of research design that behavioral researchers most commonly use to examine the effect of a therapy or intervention on a particular sample, according to Allen (2017).

The research instrument used in this study was a 50-item test which will be directly lifted from the question bank of the science department of Alabel National High School. This is the test that will be used during the pre-test and post-test. This test will coverthe first quarter learning competencies. The first learning competency is a scientific investigation under this competency 2 lessons and 2 questions will be adopted. The second learning competency will be elements and compounds, there are 3 lessons and 5 questions was lifted from this unit. The third competency will be mixtures and substances, there are 15 lessons, and 48 questions were from this unit.

The instrument used in motivation toward science consisted of 15 questions that were adapted from the instrument developed by Albate, Larcia, Jaen & Garing (2018) in the study "Students' Motivation Towards Science Learning (SMTSL) of STEM Students of the University of Batangas, Lipa City". The subjects of the study will be asked to answer the questions online through Google Forms. Using the 5-point Likert Type response where 1- Strongly Disagree, 2-Disagree, 3-Undecided, 4-Agree, and 5-Strongly Agree— the subjectsof the study will be asked to click the appropriate box of their response. This research study employed an experimental group that received treatment in the study which was the utilization of the Modified Frayer Model and Semantic Map graphic organizer. The post-test compared the performance in Science after receiving the intervention. Also, survey questions will be administered to the subject's attitude and motivation towards science before and after the motivation.

Study Sites

This research study was conducted during the first term of the first semester of the academic year 2023-2024 at Alabel National High School, located at Lalisan St. Poblacion Alabel Sarangani Province, Philippines.

RESPONDENTS AND DATA COLLECTIONS

The subjects of this research study were grade seven junior high school students of Alabel National High School. One experimental and controlled group were identified as the subject for this research, each group was composed of fifty (50) students a total of one hundred (100) subjects took part in both pre-post-test and survey questions. The subjects of the study were both subject classes of the researcher, they were chosen not only for their accessibility and convenience but also because they are heterogeneous in terms of academic performance. Using heterogeneous classrooms as subjects in the Quasi-experimental method is advantageous. Heterogenous classes have varying abilities, backgrounds, and experiences, that can provide ample sources of data for the study (Cohen, Manion, & Morrison, 2018).

Convenience sampling was used in this quasi-experimental research. It is a non- probability sampling technique widely used in research. This sampling technique involves selecting individuals for easy accessibility and availability to the researcher (Polit & Beck, 2020). The researcher used this technique due to its nature that it doesn't require a complete list of the population since the researcher has these two subject classrooms out of seven sections as a science teacher. Furthermore, the technique reduces the time and costs that other methods may consume making it a viable option for the researcher to improve the efficiency and effectiveness of the study (Jackson, 2019; Kumar, 2021).

Before the study was conducted the researcher sought consent from the school division superintendent of the Division of Sarangani (See Appendix I). The researcher waitedfor the approval of the superintendent and sent a letter to the principal of Alabel National High School for the school conduct of the study (See Appendix II). Upon receipt of the approved letter, the researcher sent the Parent Consent Form (See Appendix III). The parent consent form will be the basis for the Student Assent Form (See Appendix IV). The study will be conducted in the first grading period of the School Year 2023-2024. Participation in this research as a subject is voluntary. The instruments that will be administered will take two phases; the pre-, and post-test, survey questionnaires on attitudes toward science, andmotivation toward science. The instrument was administered through Google form, and the link will be sent to all the subjects in computer laboratories 1 and 2 during Homeroom Guidance time.

The administration of pre and post-test as well as survey questionnaires were administered online (Google Forms) which means that the researcher did not use a hard copy of the test and survey questionnaires. In Alabel National High School culture, non-academic time means the extracurricular activity time or after school, which is 4:40 p.m. This is the time that the study subjects will answer the pre-test, post-test, and survey questionnaire on separate dates, to ensure that teaching-learning classes will not be not disrupted. Students whowere identified as the subjects of the study were gathered in each room for the administrationof the instruments. The homeroom teachers reminded the students that (a) they were volunteer participants and had the right to decline participation at any time without punishment, (b) their data will be kept anonymous and confidential, and (c) they could feel free to ask questions if they will not understand any part of the

questionnaires. The researcher explained the study's purpose and instruct them to complete the online survey.

Ethical Consideration

Before accessing the questionnaire, potential participants were informed of the study's purpose and nature through a consent form. This research study undergoes additional assurances set by CLSU dissertation committee supervision on the strict adherence to the University's Ethical Standard on research activities to seek the university's Ethics Review Committee (ERC) approval

The data obtained from this study was stored in the author's data bank and shall onlybe shared with CLSU's official statistician. Strict confidentiality of data and anonymizing measures shall be adhered to in all stages of the data-gathering procedure until its analysis. Results may be shared with respondents and participating institutions if requested.

Data Analysis

The answers provided by the subjects through the questionnaires were analyzed by descriptive and inferential analyses. The study utilized a quantitative approach and collected information through presurvey and post-survey. The collected data were analyzed using Statistical Package for Social Sciences (SPSS) and MS Excel Worksheet to make the computations easier in treating the data. The researcher tabulated and summarized the collected data using Microsoft Excel.

To address the first objective mean and standard deviation were used to describe the motivation toward Science of the subjects in the experimental and control groups before and after receiving the Modified Frayer Model and Semantic mode of teaching and instructions utilizing the modified Frayer model and semantic map graphic organizers.

The second, third, and fourth t-tests were applied to find out the difference in the motivation toward Science of the subjects in the control group before and after receiving the Modified Frayer Model and Semantic mode of teaching; examine the difference in the motivation toward Science of the subjects in the experimental group before and after receiving instruction utilizing the modified Frayer model and semantic map graphic organizers; examine the difference in the motivation toward Science of the subjects in the control and experimental groups after receiving the Modified Frayer Model and Semantic mode of teaching and instruction utilizing the modified Frayer model and semantic map graphic organizers, respectively.

RESULTS AND DISCUSSION

The data collected were analyzed and explained using statistical methods, in line with the research objectives.

This section consists of four parts between the control and experimental groups, such as a description of the subjects' motivation in Science under the Control group before and after receiving the Modified Frayer Model and Semantic mode of teaching, a description of the motivation in Science of the subjects in the experimental group before and after receiving instruction utilizing the modified Frayer model and semantic map graphic organizers, the difference in the motivation towards Science of the subjects in the control group before and after receiving the Modified Frayer Model and Semantic mode of teaching, the difference in the motivation in Science of the subjects in the experimental group before and after receiving instruction utilizing the modified Frayer model and semantic map graphic organizers, the difference in the motivation towards Science of the subjects in the control and experimental groups after receiving the Modified Frayer Model and Semantic mode of teaching and instruction utilizing the modified Frayer model and semantic map graphic organizers.

Motivation Toward Science of the Subjects in the Experimental and Control Groups Before and After receiving the Non-utilization of the Modified Frayer Model and Semantic Map Mode of Teaching and Instructions Utilizing the Modified Frayer Model and Semantic Map Graphic Organizers

The pooled mean for interest in science of the subjects in the control group before receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching was 2.12, while the pooled mean for

performance in science of the subjects in the control after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching was 2.14. The control group's scores are fairly close for both Mean 1 and Mean 2, with a slight increase in scores when looking at Mean 2. The pooled mean for the performance goal in the science of the subjects in the experimental group before the utilization of the Modified Frayer Model and Semantic Map graphic organizers was 2.39, while the pooled mean of the experimental group after the intervention was 4.31. It was seen that there's a big difference between the two mean results. This explains that most of the students in the experimental group disagreed that they participate in science courses so that the teacher pays attention to them, participate in science courses so that they can get academic awards, and participate in class so that other students think that they're smart before the intervention. However, after receiving the intervention it was seen that most of the students in the experimental group show that that they agreed to the statement about interest in science. This may be because the students in the experimental group set motivation for their performance goals after receiving the intervention.

Table 1. Subjects' Perceived Motivation toward Science

Motivation	**Mean1**	**Mean2**	**Mean1**	**Mean2**
	Control		**Experimental**	
Performance Goal				
1. I participate in science courses to get a good grade.	1.82	1.96	2.22	4.34
2. I participate in science courses to perform better than other students.	2.02	1.98	2.22	4.32
3. I participate in science courses so that other students think that I'm smart	2.12	2.18	2.54	4.24
4. I participate in science courses so that the teacher pays attention to me.	2.42	2.48	2.58	4.30
5. I participate in science courses so that I can get academic awards.	2.20	2.10	2.38	4.36
Pooled Mean	**2.12**	**2.14**	**2.39**	**4.31**
Achievement Goal				
1. During a science course, I feel most fulfilled when I attain a good score in a test	2.60	2.48	2.76	4.32
2. I feel most fulfilled when I feel confident about the content in a science course.	2.20	1.96	2.32	4.42
3. During a science course, I feel most fulfilled when I am able to solve a difficult problem.	2.42	2.42	2.30	4.44
4. I feel most fulfilled when the teacher accepts my ideas.	1.98	1.90	2.34	4.30
5. During a science course, I feel most fulfilled when other students accept my ideas.	2.62	2.50	2.68	4.16
Pooled Mean	**2.36**	**2.25**	**2.48**	**4.33**
Learning Environment Stimulation				
1. I am willing to participate in this science course because the content is exciting and changeable.	2.00	1.84	2.36	4.20
2. I am willing to participate in this science course because the teacher uses a variety of teaching methods.	2.26	2.24	2.68	4.30
3. I am willing to participate in this science course because the teacher does not put a lot of pressure on me.	1.70	1.82	2.22	4.24

Motivation				
4. I am willing to participate in this science course because the teacher pays attention to me	2.04	2.10	2.46	4.26
5. I am willing to participate in this science course because the students are involve in discussions.	2.04	2.00	2.56	4.34
Pooled Mean	**2.01**	**2.00**	**2.46**	**4.27**
Over-all Mean	**2.16**	**2.13**	**2.44**	**4.30**

Legend:

0.00 – 1.80 Strongly Disagree Control/Experimental Mean1 = (Before) Mean Motivation toward Science

1.81 – 2.60 Disagree Control/Experimental Mean2 = (After) Mean Motivation toward Science

2.61 – 3.40 Undecided

3.41 – 4.20 Agree

4.21 – 5.00 Strong Agree

The pooled mean for the achievement goal in the science of the subjects in the control group before receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching was 2.36, while the pooled mean for performance in science of the subjects in the control group after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching was 2.25. The control group is fairly close for both Mean 1 and Mean 2, with a slight decrease in scores when looking at Mean 2. The pooled mean for the achievement goal in the science of the subjects in the experimental group before the utilization of the Modified Frayer Model and Semantic Map graphic organizers was 2.48, while the pooled mean of the experimental group after the intervention was 4.33. It was seen that there's a big difference between the two mean results. This explains that most of the students in the experimental group disagreed that they participate in science courses so that the teacher pays attention to them, participate in science courses so that they can get academic awards, and participate in class so that other students think that they're smart before the intervention. However, after receiving the intervention it was seen that most of the students in the experimental group show that that they agreed to the statement about interest in science. This may be because the students in the experimental group were fulfilled when they were able to solve a difficult problem in science, they gained confidence when attaining good grades and felt comfortable with their teachers in giving their ideas. Making them more motivated in engaging themselves stimulates their desire to learn science.

The pooled mean of learning environment stimulation in the science of the subjects in the control group before receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching was 2.01, while the pooled mean for performance in science of the subjects in the control group after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching was 2.00. The control group is fairly close for both Mean 1 and Mean 2, with a slight decrease in scores when looking at Mean 2. This signifies that most of the subjects in the control group before and after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching disagreed that they were willing to participate in science courses because teachers used a variety of teaching methods, that science teachers paid attention to them, and because students are involved in discussions.

The pooled mean for the learning environment stimulation in the science of the subjects in the experimental group before the utilization of the Modified Frayer Model and Semantic Map graphic organizers was 2.46, while the pooled mean of the experimental group after the intervention was 4.27. It was seen that there's a big difference between the two mean results. This explains that most of the students in the experimental group disagreed that they were willing to participate in science courses because teachers used a variety of teaching methods, science teachers paid attention to them, and students were involved in discussions before the

intervention. However, after receiving the intervention it was seen that most of the students in the experimental group show that that they agreed with the statement about learning environment stimulation in science.

The overall pooled mean of the control group before and after the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching was 2.16 and 2.13, respectively which shows that the subject students mostly disagreed with the condition statements. The overall pooled mean of the experimental group was 2.44 and 4.30 which shows that most subject students after utilization of the Modified Frayer Model and Semantic Map graphic organizers strongly agreed that they participate in science so that teachers pay attention to them, they are most fulfilled when other students accept their ideas, and they're willing to participate in science course because the teacher uses a variety of teaching methods. It just shows that overall most of the subject students who received the intervention by utilizing the Modified Frayer Model and Semantic Map graphic organizers show motivation toward science by setting performance goals, and achievement goals, and with the support of a learning environment.

Differences in the Motivation Toward Science of the Subjects in the Control Group Before and After Receiving the Non-utilization of the Modified Frayer Model and Semantic Map Mode of Teaching

The comparison of the subject's performance in the experiment group before and after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching. The Mean Before and After scores were subjected to independent sample t-tests to establish whether there was a noteworthy difference between them.

Table 2. Difference in the motivation toward Science of the subjects in the control group before and after receiving the after the non-utilization of Modified Frayer Model and Semantic Map mode of teaching

Control Group	n	Mean	SD	$t_{(49)}$	p-value	Interpretation
Before	50	2.16	0.33	0.857	0.396	Difference is NOT significant
After		2.13	0.33			

The mean score of the control group before and after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching was 2.16 and 0.33, respectively, while the standard deviation of the control group after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching was 2.13 and 0.33, respectively. These results suggests that the mean scores are not significantly higher than the mean score of the subjects after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching. The table also shows the t-value is 0.857 and the p-values is 0.396, which is greater than 0.05. This may explain why the motivation of the subjects towards science insignificantly did not improve after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching in Science. This seemed to suggest that the non-utilization of the Modified Frayer Model and Semantic Map way of teaching is not effective in improving student subject's motivation toward science. Maybe because the traditional methods of teaching revolve around the lecture. In this case, the teacher is dominant and plays the role of a knowledge transmitter while students are passive. This probably quickly makes one lose interest. As the students do not actively put together their understanding, they may fail to interact and therefore undergo no hands-on experience. This can suppress their innate curiosity and interest in the subject.

The null hypothesis indicates that there is no significant difference in the motivation toward science of the subjects in the control group before and after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching, is rejected.

Difference in The Motivation Toward Science of the Subjects in the Experimental Group Before and After Receiving the modified Frayer Model and Semantic Map graphic organizers

The experimental group obtained a mean score of 2.44 with a standard deviation of 0.41 before the utilization of the Modified Frayer Model and Semantic Map graphic organizers as an intervention whereas the mean score

of 4.30 with a standard deviation of 4.30 with a standard deviation of 0.28 following after receiving instructions from the intervention. These results indicate that the mean score of the experimental group after the intervention is greater than that of the mean score before the utilization of the Modified Frayer Model and Semantic Map graphic organizers. Additionally, the table reveals that the t-value is -25.682, and the p-value is 0.000, which is less than 0.001.

Table 3. Difference in the motivation toward Science of the subjects in the experimental group before and after receiving the modified Frayer Model and Semantic Map graphic organizers

Experimental Group	n	Mean	SD	$t_{(49)}$	p-value	Interpretation
Before	50	2.44	0.41	-25.682	0.000	Difference is highly significant
After		4.30	0.28			

The subjects in the experimental group demonstrated noteworthy enhancement in their motivation toward science with the use of the modified Frayer Model and Semantic Map could be a more efficient technique for the motivation of the student subjects.

When comparing the results of the subjects' motivation before and after the intervention, the improvement in their motivation toward science would indicate that the use of the Modified Frayer Model and Semantic Map has been effective in helping students set their goals academically. This improvement could be an indication that the Modified Frayer Model and Semantic Map graphic organizers aid in the definition, and identification of main characteristics and examples as well as non-examples. With this four-quadrant approach, students can perceive concepts thoroughly and holistically.

The high significance of the difference between the mean before and after the intervention on their motivation toward science could be due to Frayer Models and semantic Map flexibility in the classroom that make the subject matter interesting and students were engaged in separating and differentiating similar ideas. This may also give the students increased confidence in tackling new topics and they're in a better position to understand the concepts hence remembering them. The Frayer Model and semantic map are adaptable for the needs of an individual, pair, or group work and provide direct room to inject more motivation based on classroom dynamics.

Furthermore, intrinsic motivation is enhanced when students feel competent and understand the material. The use of the Frayer Model and Semantic Maps offer frameworks that enable students to simplify complex science concepts towards internally absorbing them, thereby reducing unnecessary burdens. Consequently, students are more likely to get involved with the reading, ask questions, talk in class, and show real enthusiasm for learning. Lastly, these tools also have many instructional strategies available. The approach allows students to play an active role in their learning process as opposed to being recipients of information. Thus, it can be quite motivating and empowering. Educators can therefore tap into diverse learning styles and address the needs of such students, offering Grade 7 students multiple explorations and ways to comprehend various scientific concepts thereby keeping these learners motivated in science.

The null hypothesis indicates that there is no significant difference in the motivation toward science of the subjects in the experimental group before and after receiving instruction utilizing the modified Frayer model and semantic map graphic organizers, is rejected.

Difference in Motivation Toward Science of the Subjects in the Control and Experimental Groups After Receiving the Non-utilization of the Modified Frayer Model and Semantic Map Mode of Teaching and Instruction Utilizing the Modified Frayer Model and Semantic Map Graphic Organizers

The motivation towards science of the subjects in the control and experimental group after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching and instruction utilizing the modified Frayer Model and semantic map graphic organizers. This was done by examining the mean scores of

the two groups. The data in the table indicates the subjects under the control group had an average score of 2.13 with a standard deviation of 0.33, while for the treatment, the average score was 4.30 with standard deviation of 0.28. The results suggest that there is a significant difference in the mean score of the control and treatment groups after the instruction. The table also shows that the t-value was -35.614 and the p-value is 0.000, which is less than 0.001.

Table 4. Difference in motivation toward Science of the subjects in the control and experimental groups after receiving after the non-utilization of Modified Frayer Model and Semantic Map mode of teaching and instruction utilizing the modified Frayer model and semantic map graphic organizers

Groups	n	Mean	SD	$t_{(98)}$	p-value	Interpretation
Control	50	2.13	0.33	-35.614	0.000	Difference is highly significant
Experimental		4.30	0.28			

The non-utilization of the Modified Frayer Model and Semantic Map mode of teaching, usually involves students being taught through lecturers and textbooks. As a result, this may reduce engagement and motivation among students especially when delivered in a tendentious manner. Other students in the class may comprehend scientific principles that are complex widening the gap in performance between them. This may result in frustrations and lack of motivation. Moreover, in particular, non-utilization of the Modified Frayer Model and Semantic Map teaching may not promote in-depth reflection and metacognition which could keep students from making connections between concepts to achieve deeper science aspects. This may be because the non-utilization of the Modified Frayer Model and Semantic Map schooling style usually adopts the same teaching mode that might fail to address unique interests and personal learning tendencies. Some students may be less motivated as a result.

However, this study may explain that the Modified Frayer Model and Semantic Map Organizers, allowed students to choose how they want to organize and present information, then learning might carry more meaning for them. In many cases, these tools necessitate critical thinking by students about the material, connections to other learning, and reflecting on their understanding. Such it helps learners to be motivated in that they see their own movement forward. Such tools serve to simplify the concepts by chunking them down. When students perceive connections between terms and the main thing, they may feel more sure and interested in learning. Furthermore, the Frayer Model and Semantic Map Organizers maybe these tools that encourage the students to interact with the material, a process that enhances active learning. It demands that a student rephrase the definition, give their affiliated examples, and connect. When students are actively involved, it enhances motivation because they feel participative in the process of learning.

Therefore, the use of tools such as the Frayer Model and Semantic Map organizers in instruction is intended to improve students' motivation towards science by fostering active learning, clarity, and personalization towards subject matter development targeting specific concepts-by-concepts ideas expansion on aspects where sequential levels complex establish applying distinct student learning styles and finally incorporation of reflection. Nevertheless, the potential benefits of these instruments are caused by the integration of the tools into professional and personalized learning practices.

With the findings presented above, the null hypothesis, which proposes that there is no significant difference in the motivation toward science of the subjects in the experimental group after receiving instruction utilizing the modified Frayer model and semantic map graphic organizers, is rejected.

CONCLUSION

This research study utilized the grade 7 students of Alabel National High School to assess the effectiveness of the Modified Frayer Model and Semantic Map in learning science. The findings show that most of the subjects in the control group before and after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching disagreed that they were willing to participate in science courses because teachers used

a variety of teaching methods, that science teachers paid attention to them, and because students are involved in discussions. This may be because the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching is a teacher-centered technique, where the teacher is the one leading the lesson and the students are the receiver of the information. While most of the students in the experimental group disagreed that they were willing to participate in science courses because teachers used a variety of teaching methods, science teachers paid attention to them, and students were involved in discussions before the intervention. However, after receiving the intervention it was seen that most of the students in the experimental group show that that they agreed with the statement about learning environment stimulation in science. This may be because the subjects in the experimental group were given opportunities to explore during the utilization of the Frayer Model and Semantic Map graphic organizers, that teachers may be making the discussion student-centered, where they may be able to see different teaching methods of the teacher, introduce the subject matter in exciting and pressure free delivery of the lesson.

Upon the analysis with the use of an independent sample t-test on the mean of the control group motivation toward science before and after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching, it was discovered that the motivation of the subjects towards science insignificantly did not improve after receiving the non-utilization of the Modified Frayer Model and Semantic Map mode of teaching in Science. This seemed to suggest that the non-utilization of the Modified Frayer Model and Semantic Map way of teaching is not effective in improving student subject's motivation toward science. Maybe because the traditional methods of teaching revolve around the lecture. In this case, the teacher is dominant and plays the role of a knowledge transmitter while students are passive. This probably quickly makes one lose interest. As the students do not actively put together their understanding, they may fail to interact and therefore undergo no hands-on experience. This can suppress their innate curiosity and interest in the subject. Additionally, it can be demotivating when students are assessed on their ability to reproduce information, not on how much they understand and use the information. It might lead them to view science as a composite of disjoint events and not an evolving body that must be studied holistically. Also, what has often been criticized in traditional science is that it does not relate theoretical knowledge to practical application. In daily lives, science is everywhere but the traditional methods may not always help in unearthing these connections. If the students do not recognize how what they are learning applies to their own life or society then motivation for that subject decreases. Lastly, maybe the learnings of the subjects also depend on continuous feedback and opportunities for reflection. Nonetheless, feedback in a traditional setting may be confined to intermittent performance test scores or grades. The absence of thoughtful opinions from the supportive party such as from teachers may result in students' perpetual dysfunctions if they incorrectly perceive their misconceptions without addressing them.

The high significance of the difference between the mean before and after the intervention on their motivation toward science could be due to Frayer Models and semantic Map flexibility in the classroom that make the subject matter interesting and students were engaged in separating and differentiating similar ideas. This may also give the students increased confidence in tackling new topics and they're in a better position to understand the concepts hence remembering them. The Frayer Model and semantic map are adaptable for the needs of an individual, pair, or group work and provide direct room to inject more motivation based on classroom dynamics. Furthermore, intrinsic motivation is enhanced when students feel competent and understand the material. The use of the Frayer Model and Semantic Maps offer frameworks that enable students to simplify complex science concepts towards internally absorbing them, thereby reducing unnecessary burdens. Consequently, students are more likely to get involved with the reading, ask questions, talk in class, and show real enthusiasm for learning. Lastly, these tools also have many instructional strategies available. The approach allows students to play an active role in their learning process as opposed to being recipients of information. Thus, it can be quite motivating and empowering. Educators can therefore tap into diverse learning styles and address the needs of such students, offering Grade 7 students' multiple explorations and ways to comprehend various scientific concepts thereby keeping these learners motivated in science.

The non-utilization of the Modified Frayer Model and Semantic Map mode of teaching usually involves students being taught through lecturers and textbooks. As a result, this may reduce engagement and motivation among students especially when delivered in a tendentious manner. Other students in the class may comprehend scientific principles that are complex widening the gap in performance between them. This may

result in frustrations and lack of motivation. Moreover, in particular, non-utilization of the Modified Frayer Model and Semantic Map teaching may not promote in-depth reflection and metacognition which could keep students from making connections between concepts to achieve deeper science aspects. This may be because the non-utilization of the Modified Frayer Model and Semantic Map schooling style usually adopts the same teaching mode that might fail to address unique interests and personal learning tendencies. Some students may be less motivated as a result. However, this study may explain that the Modified Frayer Model and Semantic Map Organizers, allowed students to choose how they want to organize and present information, then learning might carry more meaning for them. In many cases, these tools necessitate critical thinking by students about the material, connections to other learning, and reflecting on their understanding. Such it helps learners to be motivated in that they see their own movement forward. Such tools serve to simplify the concepts by chunking them down. When students perceive connections between terms and the main thing, they may feel more sure and interested in learning. Furthermore, the Frayer Model and Semantic Map Organizers maybe these tools that encourage the students to interact with the material, a process that enhances active learning. It demands that a student rephrase the definition, give their affiliated examples, and connect. When students are actively involved, it enhances motivation because they feel participative in the process of learning.

Therefore, the use of tools such as the Frayer Model and Semantic Map organizers in instruction is intended to improve students' motivation towards science by fostering active learning, clarity, and personalization towards subject matter development targeting specific concepts-by-concepts ideas expansion on aspects where sequential levels complex establish applying distinct student learning styles and finally incorporation of reflection. Nevertheless, the potential benefits of these instruments are caused by the integration of the tools into professional and personalized learning practices.

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