

SCIENCE LABORATORY INTEGRATED MANUAL OF EXPERIMENTS (SLIME): KEY TO UNLEASH THE LOVE FOR EXPERIMENTS OF THE GRADE 6 PUPILS OF USANT

Annalyn G. Corpin
Noemi G. De la Justa
April V. Dorosan
Richard O. Nonato
Regine Mae L. Quite
Zephra A. Ramboyong
Lorabelle M. Salvadora
Sharon I. Tabayag
Researchers

Introduction

Child's curiosity and love for science is innate to them. Every child is curious about science that is why parents and teachers must be very patient in answering their queries about science. Science is broad and is divided into many different parts. Everything around us is a science that is why we cannot blame the kids if they become interested in it. There are also a lot of things that even today nobody can answer. So, as educators, we are trying our best to help especially in solving and answering pupil's queries.

DepEd's foremost program that aims to foster critical thinking, creativity, and innovation among students, NSTF promotes Science and technology consciousness among the youth by enabling them to produce and present Science researches and projects.¹

DepEd Secretary Leonor Magtolis Briones ² said "Children in this digital age are very much into gadgets, robotics, and technology that our generation could only imagine, or see in films and read in books. Things have changed, and it is challenging to catch up, but these advancements are becoming indispensable not only in education but practically in all

aspects of life. Therefore, the Department continuously advocates the cultivation of curiosity, creativity, critical thinking, and innovation among our youth—to enable and nurture the country's generation of globally competitive innovators.” If at an early age the pupils will be trained about the scientific process of conducting research, soon we might develop those pupils that we have today to become future researchers or scientists.

Science learning is practical-oriented and requires practical activities in the laboratory. It requires broad-based experiences to widen students' knowledge in a world of abundance of choices and opportunities to give meaning to learning. Science learning employs experiments using enriching learning materials to equip learners with appropriate knowledge, skills, attitudes, and behaviors . ³ Achimugu⁴ stated that science learning involves experimentation that uses hands-on and minds-on activities for better understanding. This is because experimental methods enable students to verify theories, laws, and principles surrounding science phenomena. These parameters help the students to build their capacity and interest to attain the goals of learning science.

Inquiry-based science adopts an investigative approach to teaching and learning where students are provided with opportunities to investigate a problem, search for possible solutions, make observations, ask questions, test out ideas, and think creatively and use their intuition. In this sense, inquiry-based science involves students doing science where they have opportunities to explore possible solutions, develop explanations for the phenomena under investigation, elaborate on concepts and processes, and evaluate or assess their understandings in the light of available evidence. This approach to teaching relies on teachers recognizing the importance of presenting problems to students that will challenge their current conceptual understandings, so they are forced to reconcile anomalous thinking and construct new understandings. ⁵

Inquiry-based science challenges students' thinking by engaging them in investigating scientifically orientated questions where they learn

to give priority to evidence, evaluate explanations in the light of alternative explanations and learn to communicate and justify their decisions. These are dispositions needed to promote and justify their decisions. In short, "Scientific inquiry requires the use of evidence, logic, and imagination in developing explanations about the natural world"⁶

A positive attitude toward school is important in today's environment. Inspiring and encouraging students to do well in school can be achieved through inquiry-based science activities and labs. Young children are naturally curious and begin life as natural scientists. ⁷ With the use of different activities in science through experiments, pupils can answer problems that will be useful to them. It is also a key point in the part of both teachers and parents because through experiments they can solve problems even by themselves alone. Their attitude in solving experiments can also be used by them especially in solving real-life problems. Their experiences in solving problems can greatly help them in solving their problems.

Having a manual that will serve as their guide in conducting experiments will greatly help them in their studies most especially in acquiring firsthand information because they are the ones who will gather information to be able to answer the different questions given to them. With the help of the manual, it will be easier for them to see the flow and procedure of their experiments, and since in the manual only the materials, procedures and questions are present, the teachers will be able to test the knowledge of the pupils regarding the topic because they don't have the chance to browse or scan their book for additional answers.

This study was anchored on the theories of David A. Kolb's **Experiential Theory**, Albert Bandura's **SelfEfficacy Theory** and **Cognitive-Gestalt Approach Theory** by S. Burns. Figure 1 shows the theoretical paradigm of the study.

According to the **Experiential Learning** of **Kolb**, it focuses on the learning process for the individual. Thus, one makes discoveries and

experiments with knowledge firsthand, instead of hearing or reading about other's experiences. Likewise, in school, internship and jobshadowing, opportunities in a student's field of interest can provide valuable experiential learning which contributes significantly to the student's overall understanding of the real-time environment.⁸

Experiential learning can exist without a teacher and relates solely to the meaning-making process of the individual's direct experience. However, though the gaining of knowledge is an inherent process that occurs naturally, a genuine learning experience requires certain elements. Knowledge is continuously gained through both personal and environmental experiences.⁹

To gain genuine knowledge from an experience, the learner must have four abilities: be willing to actively involved in the experience, be able to reflect on the experience, possess and use analytical skills to conceptualize the experience and must possess decision making and problem-solving skills to use the new ideas gained from the experience. Moreover, experiential learning is specifically defined as —learning through reflection on doing.¹⁰

Pupils' first-hand experiences are the best teacher. With the use of the different activities, it will help the pupils to retain in their minds the different processes used in the different activities. Since the pupils have various activities, it will help them to reflect on their mistakes that will help them not to commit the same mistakes.

According to **Albert Bandura**, the capability that is most —distinctly human|| is that of self-reflection, hence it is a prominent feature of social cognitive theory. Through self-reflection, people make sense of their experiences, explore their cognitions and self-beliefs, engage in selfevaluation, and alter their thinking and behavior accordingly. Of all the thoughts that affect human functioning and standing at the very core of social cognitive theory are self-efficacy beliefs, —people's judgments of their capabilities to organize and

execute courses of action required to attain designated types of performances.¹¹

Since the pupils have gained already different experiences from the different activities they had answered, they have already the belief that they have the capabilities to do more challenging and enjoyable activities. With the help of the self- efficacy theory, it can help them to boost more their confidence that they can use in answering their activities. Because everything is about mind over action, if they have the confidence it will give them a positive result.

The **Cognitive-Gestalt** approaches by **S. Burn** emphasized the importance of experience, meaning, problem solving and development of insight. Burn noted that this theory has developed the concept that an individual has different needs and concerns at different times, and that they have subjective interpretations in different contexts. Exposed to different situation will strengthen the acquired knowledge and store in the memory. ¹²

With the help of the different experiences gained by the pupils and their efficiency in solving problems, it is a must that they combined these all to become a problem solver. Since a pupil has his/her own technique or even strategy, he/she can be able to solve the problem.

Experiential Learning Theory is particularly useful in this study because when pupils have already their firsthand experience. They can solve and experiment with the different problems given without the help of others. They will use the process involved for each problem given. While self- efficacy theory is about building and boosting self- confidence because they can communicate well their answers when they are asked to do it in front of others. When they have already the experiences and the self- efficacy in solving problems, Cognitive- Gestalt Theory will be of great help when the first two theories are achieved. Through experience of analyzing and interpreting different problems given to them. The pupils are led to become more confident in solving different problems in mathematics.

With the insight gained from the theories, the researchers theorized that every task or skill undergoes a learning process, especially when it is coupled with worthwhile learning activities. This theory is called "**SLIME Theory**", a teacher must be equipped with appropriate and adequate experiment materials, apparatuses, and intervention materials. These learning materials are effective tools in helping the pupils learn and participate and become more confident to prove their uniqueness and abilities. With the use also of the said theory, the love for experiments of the learners will be developed because of the series of activities made for the learners.

Research Methodology

The descriptive and experimental methods of research were utilized to answer the problems sought in the study. The descriptive research is the process of gathering, analyzing, classifying, and tabulating data using the present conditions, practices, beliefs, processes, and trends and then making adequate and accurate interpretation using statistical methods. Descriptive evaluation was used in Phase I of the study which is the construction and validation of the supplementary material.

The experimental method was employed using two groups as the subjects of the study: the control and experimental groups respectively. Using the experimental method, the control group and experimental groups were determined according to the class they belong to.

Conclusions

Based on the findings, the study conclude that:

1. The pretest result in Science 6 of the control group is higher than the experimental group.
2. Science Laboratory of Integrated Manual of Experiments (SLIME) was developed.
3. The supplemental material in science 6 is curricularly valid.

4. The posttest results of the control group is lower than the result of the experimental group.

5. There is a significant difference in the posttest result of the control and experimental group. This implies that because of the supplemental material used, it helps to improve the performance of the pupils in the experimental group.

6. Teaching science is not only about the different definitions of terms that can be found inside the book. But also other ways and strategies that can facilitate the learning process of the pupils by means of laboratory manual with different experiments.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are provided:

1. The pretest should always be conducted to identify the strengths and weaknesses of the pupils.

2. The supplemental material named SLIME should be used to help the learners love experiments.

3. The supplemental material should be improved so that all contents attain high acceptability.

4. Posttest should always be conducted to test whether the supplemental material made is effective or not.

5. Since there is a significant difference between the pretest and posttest of the two groups, it is suggested that the supplemental material should be used.

6. Pupils should be exposed more to different science experiments.