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Perform, Captivate: Its Effectiveness In Learning Science

Joanne F. Gabayeron
Narra Integrated School, Omayao Road, Panacan 2, Narra, Palawan

Abstract
This study confirms the effectiveness of the "Perform, Captivate!" strategy in boosting the students' interest in Science as manifested in their attendance, time of arrival in school, and quarter grades. The researcher employed a quasi-experimental design and involved 59 students from two heterogeneous sections. Mean and standard deviation was applied to determine the academic performance levels of both groups of respondents in the first and second quarters. Paired-sample t-test and two-sample t-test were used to determine the significant difference in the level of interest between both groups in terms of attendance, time of arrival in school, and academic performance.As a result, there was no significant difference between the first and second quarters for students in the control group; while students in the experimental group showed a significant difference between the first and second quarters. In the first quarter, both groups got a satisfactory performance. In the second quarter, after the strategy was implemented in the experimental group, they performed highly satisfactorily while the control group performed fairly satisfactorily showing that there is a significant difference in the level of interest between the two groups in terms of attendance. Further, there are significant differences in the interests of the two groups regarding school arrival times. Results imposed that when strategies were introduced, students became more interested in learning Science as shown in their attendance. Therefore, it is encouraged that "Perform, Captivate!" be used in science education.

Keywords:*Perform, Captivate, Effectiveness, Learning Science*

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I. INTRODUCTION

Science as a subject is very interesting although, to some, it is quite difficult. The majority of the students are not performing well in their studies particularly in Science because they differ greatly in their interests. Many students of today still have a negative attitude because they tend to avoid the subject and find it boring and annoying. Effective teaching cares for the student's whole growth and who he is as a person. The teacher must reckon with the individual differences of each of his or her students and modify the instructions accordingly.

This is always true that as educators, teachers play varied and vital roles in the classroom. Teachers are considered the light in the classroom. They are given extensive duties, from the simplest to most complex and very challenging jobs. One of which is keeping students' interests and engagement in the classroom. It is an essential factor in successful teaching and learning. The strategy sounds simple to educators: pique students' interests to increase their likelihood of participating in class activities. In the end, teaching them becomes much easier. However, personal experience tells that capturing students' interest and keeping them engaged is not so simple, especially when what they need to learn involves a large amount of information and complicated associations. As educators, teachers can recall instances when a student is intensely interested in an activity or topic and takes on challenging learning situations without hesitation. How to encourage this level of student interest and involvement in content, particularly Science, is the key question.

Lecturers often present entertaining videos or organize a variety of amusing demonstrations to foster students' engagement or to encourage critical analysis. Magic tricks, in particular, have been shown to activate neural circuits that underpin motivation and, therefore, could be beneficial during lectures.

As a Science teacher at Narra National High School, the researcher ascertained that the high school student's performance in Science continues to be low as revealed by their grades likewise their performance in the National Achievement Test in Science. The researcher perceived that low performance is due to a lack of students' interest in learning the subject. Due to lack of interest, students tend to get absent or come late to school resulting in low performance. With this, different strategies have to be utilized to capture students' interest and eventually make them realize the significance of attending school and increasing academic performance.

It is along this line that the researcher conceived of devising the "Perform, Captivate" Strategy and testing if it can help in the pursuit of excellence in Science instruction; hence, this study was launched.

"Perform, Captivate" is a strategy that the researcher assumed could boost the interest of students manifested in their attendance and time of arrival. This also aimed to improve the student's performance in Science. The inclusion of Magic Tricks or Science Tricks in the lesson is believed to be helpful in creative learning.

Before the lesson starts, the teacher ardently performed Science Magic to capture the interest of the students. The researcher assumed that this strategy will help motivate the students to have a positive attitude toward Science. After which it will also promote students' willingness to arrive early to school, learn the subject, and attain high grades.

II. REVIEW OF LITERATURE

Science is perceived to be of great importance because of its links to technology and industry which from a national perspective, may be areas with high priority for development. Therefore, despite conceptual complexity and a high implementation cost, science is a core subject at basic and secondary levels. Another justification for incorporating science into school curricula is that everyone needs to acquire some level of "scientific literacy" to effectively participate as citizens in modern communities. However, research indicates that many of our Filipino learners are not achieving functional literacy, which makes it too difficult for them to tackle the difficulties brought on by our rapidly changing global environment[1]. Engaging students in science and helping them understand the ideas of science has been a constant challenge for science teachers[2].

The State shall give priority to research and development, invention, innovation, and their utilization; and to science and technology education, training and services, as mandated in the Article XIV Section 1 of the 1987 Constitution. It will encourage the development of indigenous, suitable, and self-sufficient scientific and technological skills and their integration into the nation's economic and social systems.

According to the aforementioned mandate, reform initiatives have been made for several decades. These initiatives include the creation of science high schools, the enrichment of the elementary and secondary school curricula, the training of science teachers for the improvement of their knowledge and performance competence, the equipping of some schools through improvisation programs, and the development of educational materials.

The lack of science culture and shortcomings in the school curriculum, the teaching and learning process, instructional resources, and teacher preparation are the key reasons why Filipino learners perform poorly in science.

Science Teaching and Science Teacher

Society evolves over time, and as society evolves, new demands arise. Consequently, educational services are improving and evolving to meet these needs[3].In modern science and technologywith times, new information is revealed and technological innovations take place. Society must remain to develop. It is a must to step into the changing and evolving world of science and technology. Science Literacy Education for individualsis very important for the future of society[4]. Science literacy, which is well thought out to be a crucial part of science education in numerous countries, is characterized as "the unity of science-related skills, attitudes, values, conceptions, and knowledge necessary for individuals to develop their critical thinking, problem-solving and decision-making skills and to be life-long learners and to maintain their sense of curiosity about their environment and world."[5]

A teacher's attitude is a crucial factor in the process of teaching and learning. A teacher who has an unfavorable attitude may affect the student's acquisition of knowledge while a friendly attitude builds confidence, promotes, and motivates the students to learn his subjects. Teachers should provide each student with a sense of personal worth; provide an open relaxed atmosphere; look out for the welfare of all students in the class.

Quality teaching is "teaching that maximizes learning for all students". Teaching involves engaging students as active learners to make positive and inclusive changes in existing knowledge, skills, and attitudes. Inclusive change (growth) is achieved by teachers who can draw on students' experiences, aptitudes, interests, motivations, and abilities. It is intuitively obvious that teachers must possess professional knowledge and have a vast repertoire of instructional strategies and techniques.

A variety of strategies must be used to demonstrate the importance of going to school because of students' changing attitudes toward school. Students over long periods of time to see what might be a factor in students who did not finish high school. Most important was the presence of students. If they had a low attendance rate in elementary they were more than likely to continue that trend[6].

Our education system seems to rely heavily on testing and its results to distinguish a high-performing school from a low-performing school. Students are being tested throughout the school year to validate what they have learned during their school year. The standardized testing policy has made participation a problem for schools across the country. If students are expected to do well on standardized tests, they have to come to school

consistently. Due to this, the school focuses on attendance. Students' attendance is one of the major factors of high student achievement.

Although educational research has focused on the relationship between student participation and student achievement, some studies have shown that school attendance and academic achievement are closely related. Attendance is essential to student achievement and high school graduation goals. Physical presence in school is one of the most important prerequisites for student success. When a student does not attend school, he or she may not learn what he or she has learned and may fall behind in obtaining the credits needed to graduate[7]. There is also an assumption that students cannot learn when they are not in school [8]. Although this assumption seems reasonable, the underlying causal sequence of the relationships is not always clear. For example, does school attendance improve academic performance, or do high achieving students encourage regular school attendance? Regardless of association, it has led many school districts, school administrators, and state governments to devote significant resources to carefully researching, documenting, and reporting school attendance data.

Students' Interest and Magic Tricks/ Science Tricks

Engagement is understood as pleasure and interest, motivation for science, and future orientation toward science. It also refers to the degree (frequency) and extent of student participation in science-related activities[9]. In almost every aspect of human behavior, motivation is important. The choice is influenced by the motivational state in making a decision[10]. Students need interest and motivation to pursue science. Attention is an important part of both learning and motivation. Attention is a multifaceted and complex construct that includes cognitive, emotional, and neurological components. Attention is an important factor in learning because it facilitates information. It has a huge impact on the process and the immediate reaction of students in the classroom[11].

Interest is often an ambiguous concept associated with commitment, motivation, and attitude [12]. Teachers can engage students and stimulate learning by designing activities that stimulate learning[13]. Adding proactive measures to increase motivation in his behavior in four steps[14]. With these, adding magic to the classroom can be a way for teachers to create stimulating activities that encourage learning.

Magic is fun because of its surprising results that defy the observer's expectations. Much magic is based on the laws of nature and involves ingenious patterns and skillful movements to create false effects that captivate the audience. Therefore, magic and science are closely related in terms of the knowledge involved, and the basic principles of all magic must obey the laws of nature. Scientific Magic (SM) is a performance that uses modifications of natural phenomena to confound the audience's intuition [15]. SM treats scientific principles uniquely and mysteriously, stunning observers. From the point of view of science education, the entertainment properties of SM can be effectively used to generate interest. By reviewing the scientific principles and knowledge of magic tricks, you can develop an effective learning experience.

Magic can be used to encourage positive learning and behavior, leading to success in school and friendship building. Magic tricks can be used throughout the lesson or used by individual students to stimulate learning and interest in the class. There are many ways to motivate students to learn, build friendships and form a sense of belonging[16]. Using magic can be key to encouraging learning and building friendships to boost self-esteem. Incorporating magic tricks into classroom teaching also appeals to many students because magic can be visual, auditory, and kinesthetic and can be used in any content area. Children have a high level of creativity but need help to find their creativity. Using magic, you can harness that creativity to help children learn. Doing magic in front of classmates is better and more fun than an oral book problem[17].

In addition, several studies have shown that unlocking the secrets of some magic requires a different way of thinking. Showing someone how to perform a magic trick involves two main steps. In the first stage, a person experiences a series of events in which causal expectations are violated. For example, an artist can show that a box is empty, wave a magic wand, and remove a bowling ball from the box. Magicians call this an "effect". In the second stage, the performer revealed the secret of the fantasy. For example, the author could explain that the box contains several smart mirrors that can hide bowling balls. Magicians call this the "method." Divergent thinking is generally thought of as the ability to generate different solutions to a problem or problem, and several studies have shown that such thinking can be improved by observing magic tricks and/or the secrets of those tricks. Revealing the magic, an individual suddenly had an "aha" experience involving finding a solution to a problem of insight[18]. Similarly, one study investigated metacognitive perceptions when solving comprehension problems by asking participants how close they were to a solution when trying to solve a magic trick[19]. Presenting participants with the wrong solution to a magic trick inhibited the creative thinking required to solve the trick [20]. This task was supported by an MRI study that monitored participants' brain activity when they saw magic tricks[21]. The results indicate that seeing tricks activates the anterior cingulate cortex, which is associated with abnormal information processing and cognitive flexibility [22,23].

Research Questions

This study determined the effectiveness of the "Perform, Captivate" Strategy. Specifically, it sought to answer the following:

1. What is the level of performance of the two groups of respondents in the 1st Quarter and 2nd Quarter:
   1.1 control group; and
   1.2 experimental group?
2. What describes the level of interest of the control group and experimental group in terms of:
   2.1 attendance; and
   2.2 time of arrival in school?
3. Is there a significant difference between the 1st Quarter and 2nd Quarter grades of the control and experimental group?
4. Is there a significant difference in the level of interest between the two groups in terms of:
   4.1 attendance; and
   4.2 time of arrival to school?

III. RESEARCH METHODOLOGY

Research Design

The researcher employed the quasi-experimental research design to determine the effectiveness of the "Perform, Captivate" strategy.

Participants and/or Sources of Data and Information

The respondents of this study were the Grade 11 HE Block 1 and HUMSS Block 1 students at Narra National High School. For two quarters, data such as attendance, time of arrival, and academic achievement such as their grades in the first and second quarters were obtained from these students.

Data Gathering Methods

The same lessons were delivered for two groups in two quarters. During the first quarter, the researcher identified the classification of students as whether they belong to Needs Improvement (below 75), Fairly Satisfactory (75-79), Satisfactory (80-84), Highly Satisfactory (85-89), and Outstanding (90 above). During the second quarter, the control group was taught using the activities provided by the teacher while the experimental group catered using the same activities with the implementation of the "Perform, Captivate" Strategy. The grades of students in the second quarter were identified to know whether there is a change in their classification.

Students' attendance and time of arrival in school using the "Perform, Captivate" Strategy was also monitored. Data on attendance and time of arrival in the school of the two groups and the grades in two quarters were compared to determine whether using the "Perform, Captivate" Strategy is effective or not.

IV. RESULT AND DISCUSSION

The obtained results are discussed below:

Table 1. Level of Performance of the Two Groups of Respondents in the 1st Quarter and 2nd Quarter

Groups	1st Quarter			2nd Quarter		
	$\bar{X}$	s	Remarks	$\bar{X}$	s	Remarks
Control	82	4.645	Satisfactory	78	17.873	Fairly Satisfactory
Experimental	83	6.160	Satisfactory	87	5.326	Highly Satisfactory

Legend:	75 below	Needs Improvement
	76-80	Fairly Satisfactory
	81-84	Satisfactory
	85-89	Highly Satisfactory
	90 above	Outstanding

It is shown in table 1 that the responses of the students in the control group show that they have satisfactory performance before and fairly satisfactory after the study. It is notable, that the value of the mean decreased to 78 in the second quarter from 82 in the first quarter.The performance of the students in the experimental group was satisfactory in the first quarter and highly satisfactory in the second quarter. The value

of the mean increased from 83 in the first quarter to 87 in the second quarter. The four gaps manifested a positive effect on the student's interest in learning Science.

Table 2. Level of Interest of Control Group and Experimental Group in Terms of Attendance

Groups	1st Quarter			2nd Quarter		
	$\bar{X}$	s	Remarks	$\bar{X}$	s	Remarks
Control	9	3	Average	9	2.21	Average
Experimental	9	1.624	Average	12	1.529	High

Legend:
0-3 Very low
4-6 Low
7-9 Average
10-12 High
13-15 Very high

Table 2 reveals that the level of interest of the students in the control group based on attendance was average, with an average of nine days present in both quarters.Likewise, the students in the experimental group also showed an average level of interest based on attendance in the first quarter and high in the second quarter. Their average attendance of nine days present before the study increased to 12 after the study. This implies that the strategy boosts the students' interest to attend the class every day.

Table 3. Level of Interest of Control Group and Experimental Group in Terms of Arrival in School

Groups	1st Quarter			2nd Quarter		
	$\bar{X}$	s	Remarks	$\bar{X}$	s	Remarks
Control	7:39	0.006	Average	7:48	0.004	Average
Experimental	7:34	0.005	Average	7:22	0.002	High

Legend:
7:10-7:21 Very high
7:22-7:33 High
7:34-7:45 Average
7:46-7:57 Low
7:58-8:09 Very low

Table 3 shows that the level of interest of the students in the control group based on time of arrival in school was average, with a mean arrival at 7:39 and 7:48 in the first and second quarters respectively. The students in the experimental group showed an average level of interest based on time of arrival to school before the study with an average arrival at 7:34. This became high after the study with an average arrival at 7:22. Results manifested that students became excited to go to school because of the strategy.

Table 4. Significant Difference Between the 1st and 2nd Quarter Grades of the Control and Experimental Group

Groups	$t\ value$	df	Critical Value (2-tailed)	Remarks
Control	0.145	21	2.080	Not Significant
Experimental	6.220	35	2.042	Significant

$p<0.05$

Table 4 shows that there is no significant difference in the first and second quarters of the students in the control group while there is a significant difference in the first and second quarters of the students in the experimental groups.

Table 5. Significant Difference in the Level of Interest between the Two Groups in Terms of Attendance

$t-value$	df	critical value	Remarks
6.85	56	2.021	Significant

Table 5 reveals that there is a significant difference in the level of interest between the two groups in terms of attendance based on the t-value of 6.85 which is greater than the critical value of 2.021. This means that students whose strategy was introduced became more interested in learning Science.

Table 6. Significant Difference in the Level of Interest Between the Two Groups in Terms of Time of Arrival in School

t	df	critical value	Remarks
83.87	56	2.021	Significant

As gleaned from Table 6, there is a significant difference in the level of interest between the two groups in terms of the time of arrival in school based on the t-value of 83.87 which is higher than the critical value of 2.021.

V. CONCLUSION

Guided by the findings of the study, it was revealed that the "Perform, Captivate" strategy is effective in learning Science. In the first quarter, both groups got a satisfactory performance. In the second quarter, after the strategy was introduced to the experimental group, they performed highly satisfactorily while the control group performed fairly satisfactorily. The students in the experimental group became more interested in the class using the strategy which was supported by the result of their attendance and time of arrival in school from average to high respectively.There was no significant difference between students in the control group in the first and second quarters, while students in the experimental group showed a significant difference in the first and second quarters.Since the t-value of 6.85 is greater than the critical value of 2.021, there is a statistically significant difference in the level of interest between the two groups who participated in this study. There is also a statistically significant difference of interest between the two groups in terms of attendance, specifically in their time of arrival in school based on the t-value of 83.87 which is greater than the critical value of 2.021.Results imposed that when strategies were introduced, students became more interested in learning Science. Their attendance improved with an average arrival of 7:22 showing that students were excited to go to school.

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