ABSTRACT

This study explored teachers' perception of anchoring phenomena and its impact on students' science proficiency at Thomas Stone and Port Towns Elementary School in Prince George's County during the 2022-2023 school year. The research instrument was rigorously tested for reliability, and ethical clearance was obtained. Results indicate that most teachers have a positive interest in science, demonstrate mastery in teaching phenomena, and frequently incorporate anchoring phenomena in their science lessons. Students generally meet expectations in earth and space science, physical science, engineering, and technology but partially meet expectations in life science. The study also reveals a significant correlation between teachers' experience and their perception of anchoring phenomena. Furthermore, teachers' perception of anchoring phenomena significantly influences students' proficiency in all science units. These findings have implications for teacher training programs and the widespread adoption of the Anchoring Phenomenon approach in science education. One of the recommendations is to establish a teacher mentorship program and mentor-mentee training to maximize the use of anchoring phenomena. Additionally, a comprehensive review of life science lesson implementation is suggested to enhance pedagogical approaches in teaching life sciences.
INTRODUCTION

Science is everything and everywhere. People resort to science to explain various phenomena, may it be about what they feel, think, and observe. It may not be always obvious that science shapes people’s daily lives, but the reality is science impacts countless decisions people make each day. Further, science is as crucial as other subjects, such as the sciences and history. The growing emphasis on STEM education is at the forefront of discussions regarding education in the present (Singh, 2021).

Governments worldwide have their own assessment scheme to monitor their learners’ performances in various disciplines, including science. The Maryland State Department of Education (MSDE) Science Branch prioritizes coherence, collaboration, and communication to lead Maryland’s local school systems and other stakeholders in achieving high-quality, three-dimensional science teaching, learning, and assessment across science disciplines and in all grade levels to develop scientifically and environmentally literate graduates. All Maryland students will become scientifically and environmentally literate individuals who are skilled, reflective, and empowered to make informed decisions that benefit themselves, their families, and their local and global communities within an increasingly complex and continually changing world (Maryland State Department of Education, nd.).

Science instruction in Maryland schools aims for all students to successfully achieve the ambitious vision of Maryland’s Next Generation Science Standards (NGSS). The standards include rigorous performance expectations for each level of school and seamlessly incorporate the practices of science with the content of science. The Maryland Integrated Science Assessment (MISA) is administered to all fifth-, eighth-, and high school life science students. Maryland implemented the Next Generation Science Standards (NGSS) as its K-12 science education framework. The NGSS, developed through collaboration with 26 lead states, including Maryland, sought input from diverse experts, including professional scientists, college/university educators, policymakers, and K–12 educators. The NGSS framework emphasizes the practices of real scientists and engineers, core ideas spanning earth/space science, life science (biology), and physical science (chemistry and physics), and incorporates engineering principles and the practical application of science. Additionally, NGSS promotes cross-cutting ideas, which are fundamental concepts that transcend specific disciplines, contributing to a holistic understanding of complex topics and their relevance to real-life situations and societal issues, such as cause and effect and patterns.

Despite the implementation of NGSS in Maryland since 2013, there is a continued need for additional information and professional development
opportunities to enable teachers to effectively incorporate Anchoring Phenomenon in their teaching of Science concepts within each Module of the Unit. Anchoring learning in explaining phenomena supports student agency for wanting to build science and engineering knowledge. Students are able to identify an answer to "why do I need to learn this?" before they even know what the “this” is.

Consequently, this research project was initiated. The primary objective of this study is to investigate whether teachers' perceptions of the Anchoring Phenomenon are correlated with the Science proficiency levels of students in selected schools.

**FRAMEWORK**

The study is based on Edward Thorndike’s Law of Exercise which stated that any behavior that is followed by pleasant consequences is likely to be repeated, and any behavior followed by unpleasant consequences is likely to be stopped. The learner must practice what has been learned to understand and remember the learning. Practice strengthens the learning connection; disuse weakens it. Exercise is most meaningful and effective when a skill is learned within the context of a real-world application.

Mezirow’s transformative learning is defined as “an orientation which holds that the way learners interpret and reinterpret their sense experience is central to making meaning and hence learning.” Put simply, transformative learning is the idea that learners who are getting new information are also evaluating their past ideas and understanding, shifting their worldview as they obtain new information and through critical reflection. It goes beyond simply acquiring knowledge and dives into how learners find meaning and understanding in their lives. This kind of learning experience involves a fundamental change in our perceptions—learners start to question everything they knew or thought before and examine things from new perspectives to make room for new insights and information. Many learners and experts agree that this kind of learning leads to true freedom of thought and understanding.

Mezirow says transformative learning has two basic focuses—instrumental and communicative learning. Instrumental learning focuses on task-oriented problem-solving and evaluation of cause-and-effect relationships. Communicative learning focuses on how people communicate their feelings, needs, and desires. Both elements are important in transformative learning—students need to be able to focus on different types of understanding and view new perspectives that are both logical and emotional to challenge their previous understanding.

Meaning schemes or meaning structures are another important element of transformative theory and transformational learning, according to Mezirow. Perspectives and meaning schemes are two major elements of meaning structures and are our predispositions and assumptions that set the stage for our expectations. A meaning structure is basically the concepts, beliefs, judgments, and feelings that shape an interpretation of information. Students can understand their meaning structure through self-reflection, self-directed learning, and critical theory. They can critique
their assumptions to understand if what they understood as a child still holds true now that they are adults. We are thereby able to understand ourselves and our learning better. Understanding our past perspective and the ability to look at new structures and perspectives is key to transformative learning theory (WGU, 2020).

Jean Piaget is known as one of the first theorists of constructivism. His theories indicate that humans create knowledge by interacting with their experiences and ideas. His view of constructivism inspires radical constructivism because he believes that the individual is at the center of the knowledge creation and acquisition process. Most of Piaget’s theories develop through working with children, where he would challenge the idea that children are inferior thinkers compared to adults. His work provides evidence that children are not cognitively inferior to adults. He proves that children develop differently by establishing a theory involving cognitive stages.

Piaget’s cognitive theory explores how children develop. His theory splits development into four discrete stages. Although Piaget never directly linked his research on cognitive development to education, his theory plays a pivotal role in his contributions to learning theories.

Based on the research into children’s cognitive development, Piaget identified processes of accommodation (reframing one’s mental representation of the external world to fit new experiences) and assimilation (the process by which a person or persons acquire the social and psychological characteristics of a group) which are key in the interaction between experiences and ideas. These two processes focus on how learning occurs rather than what influences learning (Brau, 2018).

The term ‘constructivism’ encompasses a variety of theoretical positions (Geelan, 1997) and has mainly been applied to learning theories, focusing on learning as a conceptual change (Driver & Oldham, 1986) and to curriculum development and teaching, mainly in science (Osborne & Wittrock, 1985). It also provides some clear pointers towards teaching strategies that might assist students in conceptual reconstruction (Hodson & Hodson, 1998), such as: identifying students' views and ideas, creating opportunities for students to explore their ideas and test their robustness in explaining phenomena, accounting for events and making prediction; providing stimuli for students to develop, modify and where necessary, change their ideas and views; and, supporting their attempts to re-think and reconstruct their ideas and views.

Teaching methods based on constructivist views are very useful to help students’ learning. The following are practices derived from cognitive psychology that can help students understand, recall and apply essential information, concepts and skills. They are used to make lessons relevant, activate students’ prior knowledge, help elaborate and organize information, and encourage questioning. Important concepts from this perspective are (Slavin, 1994).

Advanced organizers: general statements given before instruction that relate new information to existing knowledge to help students process new information by activating background knowledge, suggesting relevance, and encouraging accommodation; Analogies: pointing out the similarities between things that are otherwise unlike, to help students learn new information by relating it to concepts they already have; and Elaboration: the process of thinking about new material in a
way that helps to connect it with existing knowledge.

To explicitly build on students' existing knowledge is one of the ways to encourage deep approaches to learning (Biggs, 1995). To achieve this, teachers should have a clear idea of what students have already known and understood so that they can engage students in activities that help them construct new meanings (von Glaserfeld, 1992). Moreover, the opportunities for pupils to talk about their ideas concerning concepts or issues are prominent in the learning process. Teachers who employ constructivist teaching try to help pupils to learn meaningfully. They should encourage pupils to accept the invitation to learn and to act on what they have learnt, and to provide pupils with opportunities to explore, discover and create, as well as to propose explanations and solutions.

One main purpose of using the findings of research into children's preconceptions in science is to help teachers to apply constructivist ideas about learning in the classroom (Peterman, 1991). The collaborative effort among researchers and teachers on constructivist teaching is to encourage teaching which takes account of the prior ideas and understanding of children in the development of specific concepts in science, and to stress the need to provide prospective science teachers with a model for constructivist learning situations. This lays the seeds that help prospective teachers in life-long professional growth as science educators (Anderson & Mitchener, 1994) (APFSLT, 2022).

The study's theoretical framework is based on the premise that teachers' positive perception of Anchoring Phenomenon leads to its effective implementation, resulting in improved Science proficiency among students. An engaging and enjoyable instruction of Anchoring Phenomenon is expected to generate students' enthusiasm and anticipation for Science classes.

The researcher posits that various factors, including teachers' age, grade level taught, highest educational attainment, years of experience, and professional development attended, may influence their perception of Anchoring Phenomenon. Additionally, the study aims to determine whether a significant relationship exists between teachers' perception of Anchoring Phenomenon and students' Science proficiency in selected schools.

This relationship is depicted in a simple paradigm comprising two frames: independent variables and the dependent variable. The arrow indicates that teachers' profiles are linked to their perception of Anchoring Phenomenon, and this perception, in turn, is related to students' Science proficiency in selected schools.

**OBJECTIVE OF THE STUDY**

This study aimed to determine the teachers' perception of the effectiveness of the Anchoring Phenomenon and its effect on the science proficiency of students at Thomas Stone and Port Towns Elementary School in Prince George’s County.
METHODOLOGY

Research Design
This study used quantitative research. It is a formal, objective, systematic process in which numerical data are used to obtain information about the world. This research method is used a) to describe variables, b) to examine relationships among variables, and c) to determine cause-and-effect interactions between variables (Burns & Grove, 2005).

Specifically, descriptive correlational research design was applied. The present study's descriptive part describes the teachers' perception of the anchoring phenomenon. Furthermore, it also described the students' proficiency level in the identified science units.

The correlational design was used to determine and inquire about the relationship between the profile of the teachers and their perception of the anchoring phenomenon. Also, it was used to determine and inquire about the relationship between the perception of anchoring phenomenon and students' science proficiency.

Locale of the Study
This research was conducted within the educational context of Prince George's County Public Schools District in Maryland, USA. Two Title 1 schools, Port Towns and Thomas Stone Elementary Schools, were chosen to participate in this Research. The choice of this locale was deliberate and instrumental in addressing the research objectives and questions, as it offered a rich and diverse environment for the investigation.

Respondents and Sampling Procedure
The study aimed to gather data from educators actively engaged in science instruction within the Prince George's County Public School system. The respondents for this research were drawn from a diverse group of K-5 teachers. In total, 24 teachers participated in the study, representing a broad spectrum of experience levels and grade levels.

Sampling Procedure
Participants were selected through a stratified random sampling technique to ensure the inclusion of teachers from different grade levels and with varying years of teaching experience. The following steps were undertaken:

The teacher population was divided into strata based on grade levels (Kindergarten through 5th Grade) and years of teaching experience (ranging from novice to experienced educators). Within each stratum, a random sample of teachers was selected. This method was employed to eliminate selection bias and ensure the representation of diverse perspectives.

Selected teachers were contacted and provided with information about the study's purpose and procedures. Informed consent was obtained from each participant before their inclusion in the research. The survey was done to comprehensively capture the teachers' perceptions, practices, and interactions with the
Anchoring Phenomenon in science instruction.

By employing this stratified random sampling approach, the study aimed to obtain a well-balanced and representative sample of teachers, offering a robust basis for analyzing the impact of the Anchoring Phenomenon in science education across different grade levels and teaching experience levels.

The aim of this study was to establish a correlation between teachers' perception of the Anchoring Phenomenon and the Science Proficiency of students in selected schools. To achieve this, we utilize the Maryland Integrated Science Assessment results conducted during the 2021-2022 school year. This state assessment is administered to 5th and 8th-grade students and assesses their proficiency in Science Units aligned with the NGSS curriculum.

Research Instrument

The instrument for data collection was an online survey using the Likert Scale, which was constructed specifically for this study to elicit information on the perception of science teachers on anchoring phenomenon standards. Cronbach's Alpha was used for the reliability estimation of the instrument.

Part I of the instrument ascertained the profile of the teacher respondents. Part II ascertained the teachers' perception of the anchoring phenomenon on the following constructs: A. Interest in Science; B. Level of Mastery in Teaching Phenomenon, C. frequency of teaching anchoring phenomenon.

Data Gathering Procedure

Seeking Permission

The researcher asked permission from the Department of Research and Evaluation of Prince George's County Public Schools to conduct the study and obtained consent letters from the Principals and Science teachers.

Administering the Survey

The time and date were set to meet with Ports Town Elementary School and Thomas Stone Elementary School science teachers. The researcher used purposive sampling. It represents a group of different non-probability sampling techniques.

Data Analysis

In the analysis of data, descriptive and inferential statistics were used. The respondents' profile was analyzed using frequency counts and percentages in the descriptive part. Meanwhile, the proficiency of the students in science was analyzed with the use of percentages. Furthermore, the teachers' perception of the Anchoring Phenomenon was analyzed using weighted mean and standard deviation.

The relationship between the profile of the teachers and their perception of the Anchoring Phenomenon was analyzed using Chi-square and Cramer's V correlation analysis.

The relationship between the teachers’ perception of the Anchoring Phenomenon and the Science proficiency of students in selected schools was
analyzed using Pearson R. The hypotheses were tested at 0.05 significance level.

RESULTS AND DISCUSSION

Profile of the Teachers

The distribution of respondents' age groups in both frequency and percentage. The information uncovered indicates that a notable proportion of respondents belong to the age brackets of 41 to 50 years and 51 to 60 years, with each group representing 37.5 percent of the total respondents. Conversely, the age range of 21 to 30 years accounts for a mere 8.3 percent of the overall respondent population. These findings suggest that most teachers participating in the study are in their late 40s, with an average age of 45.91. This implies that most respondents are well into their adulthood and experienced in their careers, while the last age group represents individuals nearing retirement.

The data also unveil that the largest segment of teachers teaches at the first-grade level, making up 25 percent of the total respondents. Following closely behind are teachers at the fifth-grade level, accounting for 20.8 percent of the total respondents. In contrast, a smaller group of teachers, with only 4.3 percent, teach at the third-grade level. The study findings highlight that most teacher respondents are engaged in teaching at intermediate grade levels, while a smaller number are responsible for primary grade instruction.

On the highest educational attainment, the data show that most teachers hold a bachelor's degree, accounting for 41.7 percent of the total participants. Following closely behind are those who have completed a master's degree, constituting 37.5 percent of the total respondents. In contrast, a smaller proportion, 20.8 percent, have achieved a doctorate degree. These results indicate that the predominant portion of teacher participants possess, at minimum, a bachelor's degree, which serves as the required qualification for teaching. Moreover, it is evident that only a few teachers have pursued advanced studies at the graduate level.

Regarding their years of teaching experience, it is noted that the data highlights that a significant portion of teachers, accounting for 50 percent of the total respondents, have accumulated a substantial 26 to 30 years of teaching experience. In contrast, a smaller percentage, specifically 4.2 percent, have acquired 11 to 15 years of teaching experience. The study's findings emphasize that many teacher respondents possess extensive experience in the field of education, spanning over two to three decades of teaching. This observation signifies the presence of a highly experienced and seasoned group of educators, as demonstrated by their significant tenure in the profession.

Based on the number of professional development session participants, data reveals that a notable percentage of teachers, comprising 33.3% of the total respondents, have participated in 1 to 5 professional development sessions. In contrast, a smaller percentage, specifically 4.2%, have participated in more professional developments, specifically 16 to 20. These findings suggest that a
A significant number of teachers have engaged in a moderate amount of professional development activities. This indicates that most teachers have been offered appropriate and relevant opportunities for professional growth that cater to their specific requirements in the field. Furthermore, it can be inferred that both Thomas Stone and Port Towns Elementary schools ensure equal access to necessary technical assistance, providing equitable opportunities for all teachers.

Table 1. Summary of the Perception of Teachers in Anchoring Phenomenon

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Weighted Mean</th>
<th>Standard Deviation</th>
<th>Descriptive Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interest in Science</td>
<td>3.94</td>
<td>1.03</td>
<td>Agree</td>
</tr>
<tr>
<td>2. Level of Mastery in Teaching Phenomenon</td>
<td>4.02</td>
<td>1.03</td>
<td>Agree</td>
</tr>
<tr>
<td>3. Frequency of Teaching Anchoring Phenomenon</td>
<td>4.00</td>
<td>0.96</td>
<td>Often</td>
</tr>
<tr>
<td>Overall</td>
<td>3.98</td>
<td>1.006</td>
<td>Agree/Often</td>
</tr>
</tbody>
</table>

Table 1 offers a comprehensive summary of teachers' perceptions regarding anchoring phenomena. The data shows that the dimension with the highest weighted mean is the level of mastery in the teaching phenomenon, achieving a score of 4.02. This is closely followed by the frequency dimension in teaching anchoring phenomena, with a weighted mean of 4.00. On the other hand, the dimension of interest in Science has the lowest weighted mean among the three, with a value of 3.94.

The overall mean of 3.98 suggests that teachers in the study area positively perceive the teaching of anchoring phenomena. This indicates that the respondents generally express agreement in their interest in Science and their level of mastery in teaching phenomena. Moreover, it highlights that respondents frequently practice teaching anchoring phenomena as a part of their pedagogical approach in teaching Science lessons.

Table 2. Proficiency of students in science units in the study area

<table>
<thead>
<tr>
<th>Science Units</th>
<th>Level 2 Partially Met Expectations (650-725)</th>
<th>Level 3 Approached Expectations (725-749)</th>
<th>Level 4 Met Expectations (750-789)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth and Space Science</td>
<td>18.5 %</td>
<td>66.5 %</td>
<td>15%</td>
</tr>
<tr>
<td>Physical Science</td>
<td>36.5%</td>
<td>56%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Life Science</td>
<td>42.5%</td>
<td>34.5%</td>
<td>23%</td>
</tr>
<tr>
<td>Engineering and Technology</td>
<td>30.5%</td>
<td>57.5%</td>
<td>12%</td>
</tr>
</tbody>
</table>
Table 2 provides an overview of the science proficiency levels attained by learners in various units. The data reveals that learners from Thomas Stone and Port Towns Elementary Schools, the selected Title 1 schools, achieved proficiency levels ranging from level 3 to level 4, per state guidelines.

In the Earth and Space Science unit, most learners, amounting to 66.5 percent, achieved level 3 proficiency, while only a small percentage, 15 percent, reached level 4. This suggests that most learners "approached expectations" in Earth and Space Science lessons.

In the Physical Science unit, the highest percentage of learners, 56 percent, achieved level 3 proficiency, with only 7.5 percent reaching level 4. This indicates that most learners "approached expectations" in Physical Science lessons.

For the Life Science unit, the majority of learners, at 42.5 percent, attained level 2 proficiency, while 23 percent achieved level 4. This signifies that most learners "partially met expectations" in Life Science lessons.

In the Engineering and Technology Science unit, most learners, 57.5 percent, reached level 3 proficiency, with only 12 percent achieving level 4. This demonstrates that most learners "approached expectations" in Engineering and Technology lessons.

The consolidated data reveal that learners in Earth and Space Science, Physical Science, and Engineering and Technology Science units predominantly achieved level 3 proficiency, which is one step below the highest level. This implies that most students are operating at a moderate achievement level within the context of anchoring phenomena implementation. On the other hand, proficiency in Life Science is the lowest, with students achieving only one step above the lowest level of proficiency within the anchoring phenomenon implementation. This finding suggests revisiting the processes and technical aspects of anchoring phenomena across different science units.

Table 3. Correlation between the profile of teachers and their perception of anchoring phenomenon in terms of Interest in Science

<table>
<thead>
<tr>
<th>Profile</th>
<th>Chi Square Value</th>
<th>Cramer's V Correlation Coefficient</th>
<th>Probability Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>47.444</td>
<td>0.815</td>
<td>0.260</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Grade Level</td>
<td>1.090</td>
<td>0.905</td>
<td>0.563</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Highest Educational Attainment</td>
<td>26.044</td>
<td>0.721</td>
<td>0.571</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Years of Teaching Experience</td>
<td>91.333</td>
<td>0.890</td>
<td>0.044*</td>
<td>Reject Ho</td>
</tr>
<tr>
<td>Number of Professional Development</td>
<td>66.800</td>
<td>0.856</td>
<td>0.613</td>
<td>Not Reject Ho</td>
</tr>
</tbody>
</table>

* significant at 0.05 level of significance

Table 3 presents the correlation between teachers' profiles and their perception
of anchoring phenomena, specifically in terms of interest in science. The table reveals probability values for various profile variables: age, grade level taught, highest educational attainment, number of professional developments attended, and years of teaching experience.

For age, grade level, highest educational attainment, and number of professional developments attended, the probability values are 0.260, 0.563, 0.571, and 0.613, respectively. These statistical findings do not reject the null hypotheses, indicating that there is no significant correlation between these variables and teachers' interest in science. In other words, these factors do not appear to influence teachers' perceptions of anchoring phenomena in terms of their interest in science.

The variable "years of teaching experience" yielded a probability value of 0.044, leading to the rejection of the null hypothesis. This signifies a significant correlation between years of teaching experience and teachers' perception of anchoring phenomena in terms of their interest in science. With a Cramer's V coefficient of 0.890, it is evident that this variable strongly influences teachers' perceptions of anchoring phenomena in relation to their interest in science. This finding aligns with Howell's (2021) report, which suggests that years of teaching experience impact how teachers perceive their interest in science when utilizing anchoring phenomena. It supports the notion that seasoned teachers often exhibit dedication and interest in teaching science through project-based learning, where students acquire knowledge and skills by engaging in extended investigations to address authentic, engaging, and complex questions, problems, or challenges.

Table 4. Correlation between the profile of teachers and their perception of anchoring phenomenon in terms of mastery in teaching phenomenon

<table>
<thead>
<tr>
<th>Profile</th>
<th>Chi Square Value</th>
<th>Cramer's V Correlation Coefficient</th>
<th>Probability Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>43.492</td>
<td>0.803</td>
<td>0.286</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Grade Level</td>
<td>1.103</td>
<td>0.906</td>
<td>0.318</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Highest Educational Attainment</td>
<td>25.194</td>
<td>0.716</td>
<td>0.508</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Years of Teaching Experience</td>
<td>88.571</td>
<td>0.887</td>
<td>0.028*</td>
<td>Reject Ho</td>
</tr>
<tr>
<td>Number of Professional</td>
<td>77.238</td>
<td>0.873</td>
<td>0.142</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* significant at 0.05 level of significance

Table 4 illustrates the correlation between teachers' profiles and their perception of anchoring phenomena, specifically in terms of mastery in teaching phenomena. The table displays probability values for various profile variables: age, grade level taught, highest educational attainment, number of professional developments attended, and years of teaching experience.
developments attended, and years of teaching experience.

For age, grade level, highest educational attainment, and the number of professional developments attended, the probability values are 0.286, 0.318, 0.508, and 0.142, respectively. These statistical findings do not reject the null hypotheses, suggesting that there is no significant correlation between these variables and teachers' mastery in teaching phenomena. In other words, these factors do not appear to influence teachers' perceptions of anchoring phenomena in terms of their mastery in teaching.

On the other hand, the variable "years of teaching experience" yielded a probability value of 0.028, leading to the rejection of the null hypothesis. This indicates a significant correlation between years of teaching experience and teachers' perception of anchoring phenomena in terms of their mastery of teaching phenomena. With a Cramer's V coefficient of 0.887, it is evident that this variable strongly influences teachers' perceptions of anchoring phenomena in relation to their mastery of teaching. This finding aligns with Howell's (2021) report, which suggests that a science teacher's years of teaching experience are associated with greater mastery of teaching phenomena. This enables students to explore real-world problems and develop solutions to issues in their communities.

Table 5. Correlation between the profile of teachers and their perception of anchoring phenomenon in terms of frequency of teaching anchoring phenomenon in a module

<table>
<thead>
<tr>
<th>Profile</th>
<th>Chi Square Value</th>
<th>Cramer's V Correlation Coefficient</th>
<th>Probability Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>27.659</td>
<td>0.732</td>
<td>0.150</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Grade Level</td>
<td>62.810</td>
<td>0.851</td>
<td>0.248</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Highest Educational Attainment</td>
<td>22.095</td>
<td>0.692</td>
<td>0.077</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Years of Teaching Experience</td>
<td>31.643</td>
<td>0.754</td>
<td>0.031*</td>
<td>Reject Ho</td>
</tr>
<tr>
<td>Number of Professional Development</td>
<td>42.976</td>
<td>0.801</td>
<td>0.162</td>
<td>Not Reject Ho</td>
</tr>
</tbody>
</table>

* significant at 0.05 level of significance

Table 5 displays the correlation between teachers' profiles and their perception of anchoring phenomena, specifically in terms of the frequency of teaching anchoring phenomena in a module. The table presents probability values for various profile variables: age, grade level taught, highest educational attainment, number of professional developments attended, and years of teaching experience.

The probability values of age, grade level, highest educational attainment, and the number of professional developments attended are 0.150, 0.248, 0.077, and 0.162, respectively. These statistical findings do not reject the null hypotheses, indicating that
there is no significant correlation between these variables and teachers' perceptions of anchoring phenomena in terms of the frequency of teaching anchoring phenomena in a module. In other words, these factors do not appear to influence teachers' perceptions regarding how often they use anchoring phenomena in their teaching.

Furthermore, the variable "years of teaching experience" yielded a probability value of 0.031, leading to rejecting the null hypothesis. This signifies a significant correlation between years of teaching experience and teachers' perception of anchoring phenomena in terms of the frequency of teaching anchoring phenomena in a module. With a Cramer's V coefficient of 0.754, it is evident that this variable strongly influences teachers' perceptions regarding how frequently they incorporate anchoring phenomena into their science teaching. This finding aligns with Howell's (2021) report, which suggests that science teachers' years of teaching experience are associated with a more frequent application of anchoring phenomena in their science lessons. This is likely due to their accumulated experience, allowing them to integrate anchoring phenomena into their teaching methods effectively.

Table 6. Correlation between the teachers' perception of an anchoring phenomenon in terms of interest in science and science proficiency of students

<table>
<thead>
<tr>
<th>Science Proficiency of Students</th>
<th>Pearson R value</th>
<th>Probability Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth and Space Science</td>
<td>0.330</td>
<td>0.241</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Life Science</td>
<td>0.451</td>
<td>0.052</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Physical Science</td>
<td>0.153</td>
<td>0.114</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Engineering and Technology</td>
<td>0.247</td>
<td>0.008*</td>
<td>Reject Ho</td>
</tr>
</tbody>
</table>

* - significant at 0.05 level of significance

Table 6 depicts the correlation between teachers' perceptions of the anchoring phenomenon in terms of their interest in science and students' science proficiency. The science proficiency in the units of earth and space science, life science, and physical science showed probability values of 0.241, 0.052, and 0.114, respectively. These values lead to the non-rejection of the null hypotheses, indicating that teachers' perceptions of the anchoring phenomenon in terms of their interest in teaching science do not significantly impact students' proficiency in these units.

Moreover, in the case of engineering and technology, a probability value of 0.008 was obtained, leading to the rejection of the null hypothesis. This suggests a significant association between teachers' perceptions of the anchoring phenomenon in terms of their interest in teaching science and the proficiency of learners in engineering and technology. This finding highlights that the teachers' interest in science can significantly affect learners' performance in engineering and technology.

This study's findings align with the conclusions drawn by Acic (2022) in the study titled "Anchoring Phenomenon and 5Es in High School Physics." Acic's research emphasizes that when teachers exhibit a genuine interest in their science classrooms, it positively influences students' competency in science. It is evident from
these findings that the teacher's variable can, in turn, have a substantial impact on the outcomes of science education.

Table 7. Correlation between the teachers' perception of the anchoring phenomenon in terms of the level of mastery in teaching phenomenon and science proficiency of students

<table>
<thead>
<tr>
<th>Science Proficiency of Students</th>
<th>Pearson r value</th>
<th>Probability Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth and Space Science</td>
<td>0.246</td>
<td>0.356</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Life Science</td>
<td>0.135</td>
<td>0.742</td>
<td>Not Reject Ho</td>
</tr>
<tr>
<td>Physical Science</td>
<td>0.246</td>
<td>0.019*</td>
<td>Reject Ho</td>
</tr>
<tr>
<td>Engineering and Technology</td>
<td>0.245</td>
<td>0.032*</td>
<td>Reject Ho</td>
</tr>
</tbody>
</table>

* significant at 0.05 level of significance

Table 7 illustrates the correlation between teachers' perceptions of the anchoring phenomenon in terms of their level of mastery in teaching the phenomenon and students' science proficiency. The science proficiency in earth and space science and life science units showed probability values of 0.356 and 0.742, respectively. These values led to the non-rejection of the null hypotheses, suggesting that teachers' perceptions of the anchoring phenomenon in terms of their mastery in teaching the phenomenon do not significantly impact students' proficiency in these units.

Conversely, in the cases of physical science, engineering, and technology, probability values of 0.019 and 0.032 were obtained, leading to rejecting the null hypotheses. This indicates a significant association between teachers' perceptions of the anchoring phenomenon in terms of their mastery in teaching the phenomenon and the proficiency of learners in physical science, engineering, and technology. This finding emphasizes that the teachers' mastery in teaching the phenomenon can significantly affect the performance of learners in the fields of physical science, engineering, and technology.

These findings align with the conclusions drawn by Acic (2022) in the State of Montana, which emphasize that teachers' mastery of pedagogical applications of the anchoring phenomenon in the science classroom can influence students' performance in science units. The study's results indicate that the teacher's variable may indeed have a noteworthy impact on the outcomes of science learning in Title 1 schools.

Table 8. Correlation between the teachers' perception of anchoring phenomenon in terms of frequency of teaching anchoring phenomenon and science proficiency of students

<table>
<thead>
<tr>
<th>Science Proficiency of Students</th>
<th>Pearson r value</th>
<th>Probability Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth and Space Science</td>
<td>0.345</td>
<td>0.004*</td>
<td>Reject Ho</td>
</tr>
<tr>
<td>Life Science</td>
<td>0.743</td>
<td>0.018*</td>
<td>Reject Ho</td>
</tr>
<tr>
<td>Physical Science</td>
<td>0.369</td>
<td>0.005*</td>
<td>Reject Ho</td>
</tr>
<tr>
<td>Engineering and Technology</td>
<td>0.453</td>
<td>0.000**</td>
<td>Reject Ho</td>
</tr>
</tbody>
</table>
Table 8 displays the correlation between teachers' perceptions of the anchoring phenomenon in terms of teaching frequency and students' science proficiency. As observed in the table, the science proficiency in earth and space science, life science, physical science, engineering, and technology garnered probability values of 0.004, 0.018, 0.005, and 0.000, respectively. These values lead to rejecting the null hypotheses, signifying that teachers' perceptions of the anchoring phenomenon's teaching frequency significantly impact learners' proficiency across all science units.

It is noteworthy to emphasize the challenges associated with teaching physical science, which can influence students' academic performance. This aligns with the empirical findings of Dare (2018) that the field of physical sciences encompasses a wide array of topics, including physics and chemistry, which can be intricate and demand a profound comprehension of fundamental principles. This complexity can make educators unable to convey information to learners engaging and comprehensibly effectively. Physical science often entails abstract concepts and mathematical calculations, which some students may find challenging to grasp. It necessitates cultivating critical thinking and problem-solving skills, which may require time and practice to develop.

The link between teachers’ practices and students’ academic performance has been validated by Barriero and Bozzutti’s research (2018). They discuss that engineering and technology science often require hands-on learning experiences, such as laboratory experiments, design projects, and prototyping. Access to essential resources, equipment, and facilities can present logistical challenges for educational institutions. Moreover, engineering and technology science frequently intersect with other disciplines, such as mathematics, physics, and computer science. Effectively integrating these subjects and ensuring a cohesive understanding can be demanding for teachers, as it necessitates collaboration and coordination across different departments.

The study's findings corroborate the conclusions drawn by Acic (2022), indicating that the extent to which the anchoring phenomenon is integrated into the science classroom significantly impacts students' performance in science competencies. Furthermore, the findings underscore the role of teacher-related variables in shaping the outcomes of science education at Thomas Stone and Port Towns Elementary Schools, the selected Title 1 schools.

**Intervention Plans**

The best intervention plans can vary depending on a given educational situation's specific context, goals, and challenges. However, here are some general intervention plans that can be effective in improving science education, especially in the context of implementing anchoring phenomena:

1. **Professional Development Workshops**: Organize regular professional development workshops or training sessions for teachers. These workshops should focus on effective strategies for incorporating anchoring phenomena into science instruction. They can include hands-on activities, discussions, and demonstrations to help teachers grasp the concept and learn practical methods for its implementation.
2. **Mentorship Programs**: Establish mentorship programs where experienced teachers (mentors) guide and support newer teachers (mentees). This mentor-mentee approach can facilitate sharing best practices, strategies, and resources related to anchoring phenomena, ensuring that new teachers have the necessary support to use this approach in their classrooms effectively.

3. **Curriculum Revision and Development**: Collaborate with curriculum developers to revise and enhance the existing science curriculum to better integrate anchoring phenomena. The curriculum should be designed to align with Next Generation Science Standards (NGSS) and incorporate real-world phenomena that engage students and foster inquiry-based learning.

4. **Resource Allocation**: Ensure that schools have access to the necessary resources, materials, and technology to implement anchoring phenomena effectively. This may involve budget allocations for science supplies, technology upgrades, and the development of multimedia resources that support the teaching and exploration of anchoring phenomena.

5. **Data Collection and Analysis**: Implement a data-driven approach to assess the impact of anchoring phenomena on student learning and teacher effectiveness. Regularly collect and analyze student performance data, feedback from teachers, and classroom observations to identify areas for improvement and inform ongoing professional development efforts.

6. **Interdisciplinary Collaboration**: Encourage interdisciplinary collaboration among science teachers and teachers from other subjects. Anchoring phenomena can be used to connect science concepts with other disciplines, providing a holistic and integrated learning experience for students.

7. **Parent and Community Involvement**: Engage parents and the community in science education by organizing events, workshops, and presentations that showcase the benefits of anchoring phenomena. This can foster a supportive environment for science learning both inside and outside the classroom.

8. **Research and Evaluation**: Support research initiatives to continually evaluate the effectiveness of anchoring phenomena in science education. Collaborate with educational researchers to conduct studies that assess the impact on student achievement, teacher practices, and overall curriculum effectiveness.

9. **Continuous Improvement Feedback Loop**: Establish a feedback loop involving teachers, students, and curriculum developers to continuously refine the implementation of anchoring phenomena. This iterative process allows for ongoing improvement and adaptation based on the evolving needs of the educational community.

10. **Policy Advocacy**: Advocate for policies at the district or state level that promote the integration of anchoring phenomena into science education. This can include advocating for curriculum standards that explicitly include anchoring phenomena as a teaching approach.

Ultimately, the best intervention plans should be tailored to the specific needs and goals of the educational institution or district and should involve collaboration...
among administrators, teachers, curriculum developers, and the broader community to ensure the success of anchoring phenomena in science education.

CONCLUSION

In conclusion, the study "Teachers' Perception on Anchoring Phenomenon and its Effect on Students' Science Proficiency: an Input for a Training Program" underscores the critical role of teachers' perceptions in shaping science education outcomes. The findings suggest that while various factors related to teachers' profiles, such as age, grade level, and educational attainment, may not significantly influence their interest or mastery of teaching anchoring phenomena, years of teaching experience significantly impact these perceptions. Importantly, this study highlights that teachers' perceptions of anchoring phenomena can impact students' science proficiency, especially in Engineering and Technology. These findings emphasize the importance of tailoring training programs to enhance teachers' understanding and utilization of anchoring phenomena, ultimately benefiting students' science education and proficiency.

RECOMMENDATIONS

The following are the recommendations of based on the inquiry of the study:

For the District

1. Professional Development Programs: Implement targeted professional development programs for teachers focusing on anchoring phenomena, especially in challenging areas like physical science and engineering and technology science. These programs should emphasize effective teaching methods, curriculum design, and interdisciplinary collaboration.

2. Curriculum Alignment: Ensure that the curriculum aligns effectively with the Next Generation Science Standards (NGSS) to provide students with a comprehensive understanding of the science units. Regularly review and update the curriculum to reflect best practices and the latest educational standards.

3. Resource Allocation: Allocate resources and support for teachers, particularly in providing materials and equipment needed for hands-on learning experiences in engineering and technology science. Ensuring access to these resources can enhance the quality of education in these areas.

4. Monitoring and Assessment: Implement ongoing assessment and monitoring of student progress, especially in units where proficiency levels are lower. Use these assessments to identify areas for improvement and provide targeted support.
For the Teachers

1. **Engage in Continuous Learning:** Teachers should actively engage in continuous professional development, particularly in areas where they have less experience. This will enhance their mastery of teaching anchoring phenomena and improve their teaching skills.

2. **Collaboration:** Collaborate with colleagues from various departments, especially in interdisciplinary subjects like engineering and technology science. This collaboration can provide new perspectives and approaches to teaching.

3. **Reflect and Adapt:** Reflect on their teaching practices and consider how they can adapt their methods to be more engaging and effective in conveying complex science concepts, especially in physical science.

For the Students

1. **Support Science Learning:** Encourage and support the children's interest in science. Provide them with resources and opportunities to explore scientific concepts outside of the classroom.

2. **Communication:** Maintain open communication with teachers to understand the child's progress in science and seek ways to support their learning.

For Researchers

1. **Further Investigation:** Researchers should conduct further investigations into the impact of anchoring phenomena in science education. Explore other variables that may influence student proficiency and analyze additional factors that contribute to teacher effectiveness.

2. **Disseminate Findings:** Share research findings with educators, districts, and policymakers to inform best practices in science education.

3. **Teacher Training Models:** Develop and assess new teacher training models that focus on improving teachers' abilities to teach anchoring phenomena effectively.

4. **Interdisciplinary Research:** Conduct interdisciplinary research to understand the relationships between different science disciplines, teaching practices, and student proficiency.

By implementing these recommendations, the educational community can enhance the quality of science education and support both teachers and students in their pursuit of improved proficiency and learning outcomes.

**LITERATURE CITED**