



Motivational Teaching Strategy and Learners Interest in Basic Science and Technology

Essien Edem UDO, fstan Ph.D ¹, Utitofon E. MICHAEL ², Evans Ekaette Sunday ³

¹ Science Education Department, University of Uyo, Uyo

² Department of Integrated Science College of Education, Afaha Nsit

³ Department of Chemistry, School of Science, Akwa Ibom College of Education, Afaha Nsit

Abstract: *In education, motivation plays a crucial role in shaping students' attitudes, behaviors, and overall learning experiences. Motivational teaching strategies are vital in promoting learners' interest and engagement in subjects like basic science and technology. The study analyzed motivational teaching strategies and learners' interest in basic science and technology. The study revealed that motivational techniques like providing constructive feedback, recognizing students' efforts, integrating hands-on experiments, interactive simulations, and multimedia resources can make learning basic science and technology more engaging. These methods appeal to various learning styles and can bring abstract concepts to life, increasing students' interest. The study concludes that motivational teaching strategies are a powerful catalyst for sparking learners' genuine interest in basic science and technology. These strategies, encompassing reward, good use of instructional materials, inquiry-based learning, and a supportive classroom environment, lead to increased engagement and improved academic performance. They also foster a long-term passion for science and technology, enhancing self-efficacy and problem-solving skills. One of the recommendations made was that teachers should integrate real-world examples and applications of basic science and technology concepts into their teaching. Show students how these subjects are relevant to their daily lives and future careers.*

Keywords: *Motivational Teaching Strategy, Learners Interest, and Basic Science And Technology.*

Introduction

In order to increase students' involvement and interest in areas like technology and basic science, motivational teaching tactics are essential. Motivation is essential in education because it influences students' attitudes, behaviours, and overall learning experiences. When students are motivated, they are more likely to take an active role in their education, which has a big impact on how well they comprehend and remember scientific and technological topics. Creating connections between the material being taught and the real world is a powerful motivational teaching technique. Learners are more likely to see how what they are learning may be used in real-world situations when teachers connect fundamental scientific and technology concepts to everyday life. For example, discussing how scientific principles underpin technological advancements in their daily lives, like smartphones or renewable energy sources, can capture students' interest. Furthermore, fostering curiosity and inquiry-based learning is essential. Encouraging students to ask questions, explore problems, and seek solutions on their own can ignite their intrinsic motivation to learn. This strategy aligns with the

constructivist approach to education, where students actively construct their understanding of the world, and it has been shown to enhance learners' engagement in science and technology.

Creating a positive and supportive learning environment is critical. When students feel safe to express their ideas and make mistakes without fear of judgment, they are more likely to be motivated to learn (Gentry et al., 2019). Teachers can also use motivational techniques like providing constructive feedback and recognizing students' efforts and achievements to boost self-esteem and motivation (Deci et al., 2017). Integrating hands-on experiments, interactive simulations, and multimedia resources can make learning basic science and technology more engaging. These methods appeal to various learning styles and can bring abstract concepts to life, increasing students' interest. Motivational teaching strategies that establish relevance, encourage inquiry-based learning, create supportive environments, and employ interactive resources can significantly impact learners' interest in basic science and technology. Motivated students are more likely to become active participants in their education, leading to a deeper understanding of these subjects and potentially fostering future scientists, technologists, and innovators.

Concept of Teaching Strategy

A teaching strategy is a generalised plan for a lesson that includes structure, instructional objectives, and an outline of planned tactics necessary to implement the strategies. Issac (2010) explains that teaching tactics are the behaviour of the teacher that he manifests in the class, i.e., the development of the teaching strategies, giving proper stimulus for timely responses, drilling the learned responses, increasing the responses through extra activities, and so on. When we use the term method, it implies some orderly way of doing something. Thus, we use the terms technique and procedure as synonyms to signify a series of steps that one takes to employ any general model being used in the classroom. Each of these aspects emanates from a broader and more encompassing model. Teaching strategies encompass a diverse range of techniques and methods employed by educators to facilitate effective learning and engage students in meaningful ways. One fundamental strategy is active learning, which encourages students to participate in their own education through activities such as group discussions, problem-solving exercises, and hands-on projects. This approach fosters critical thinking and problem-solving skills, enhancing students' comprehension and retention of information (Stone and Morris, in Isaac, 2010).

Another crucial strategy is differentiated instruction, a framework that tailors teaching to accommodate various learning styles and abilities (Tomlinson, 2017). It acknowledges that students have diverse needs and helps teachers adapt their methods accordingly. By utilising this strategy, educators can better address individual student strengths and weaknesses. The incorporation of technology in education is a prominent teaching strategy. Blended learning, for instance, combines traditional classroom teaching with digital resources and online platforms, allowing for more flexibility and personalised instruction (Graham, 2019). This approach accommodates the demands of the modern, tech-savvy generation of students. Finally, assessment strategies play a pivotal role in effective teaching. Formative assessment, where teachers provide ongoing feedback to guide students' learning, has been shown to be highly beneficial. Summative assessments, like exams and projects, offer a means to evaluate students' overall understanding. Effective assessment strategies help inform instruction and identify areas where students may need additional support, enabling teachers to adapt and improve their teaching methods.

Concept of Motivational Teaching Strategy

Motivational teaching strategies are a powerful catalyst for sparking learners' genuine interest in basic science and technology. These strategies, encompassing real-world relevance, inquiry-based learning, and a supportive classroom environment, lead to increased engagement and improved academic performance. They also foster a long-term passion for science and technology, enhancing self-efficacy and problem-solving skills. Ultimately, motivational teaching not only empowers individual students but also contributes to a scientifically literate society, driving innovation and addressing global challenges through a well-prepared workforce.

The majority of teachers recognise that motivating their learners is part of their job, though it is probably more important for some than for others. In certain pedagogic contexts (e.g., adult vocational or academic settings), learners may, or may be expected to, bring with them such high initial levels of motivation that the teacher's focus is exclusively on maximising the efficiency of the learning processes. At the other extreme, there are pedagogic contexts where learners are compelled to attend and where the teacher's main task is to persuade them to engage in learning tasks. For teachers working in contexts somewhere between those extremes, there will be times (e.g., Monday mornings?) or tasks (grammar revision sessions?) when deliberate attempts to motivate may feel more urgent, and of course there will be some learners for whom such efforts will be more necessary. Motivational strategy is a deliberate and structured approach aimed at inspiring and energizing individuals or groups to achieve specific goals or desired outcomes. This concept is widely applicable across various domains, including education, business, sports, and personal development. Effective motivational strategies are designed to tap into the intrinsic and extrinsic motivations of individuals, aligning their efforts with the objectives set by educators, leaders, or managers.

Concept of Basic Science

Basic sciences are defined as the scientific disciplines of mathematics, physics, chemistry, and biology. They are called basic sciences because they provide a fundamental understanding of natural phenomena and the processes by which natural resources are transformed (Uppsala University 2023). Basic science is a branch of science that aims to understand the fundamental principles of the natural world. It encompasses a wide range of fields, including physics, chemistry, biology, and geology, among others. Basic science is often referred to as "pure" science, as it is driven by a desire to understand the natural world, rather than by practical applications. It is the foundation on which applied sciences, such as medicine and engineering, are built. Basic science, often referred to as pure or fundamental science, is the systematic pursuit of knowledge driven by curiosity and the desire to understand the fundamental principles that underpin the natural world. Unlike applied science, which aims to solve practical problems or develop specific technologies, basic science seeks to answer questions about the world for the sake of expanding human understanding. Basic science is at the forefront of human understanding, pushing the boundaries of what we know about the physical, chemical, biological, and social world. It aims to answer fundamental questions about the universe and our place within it.

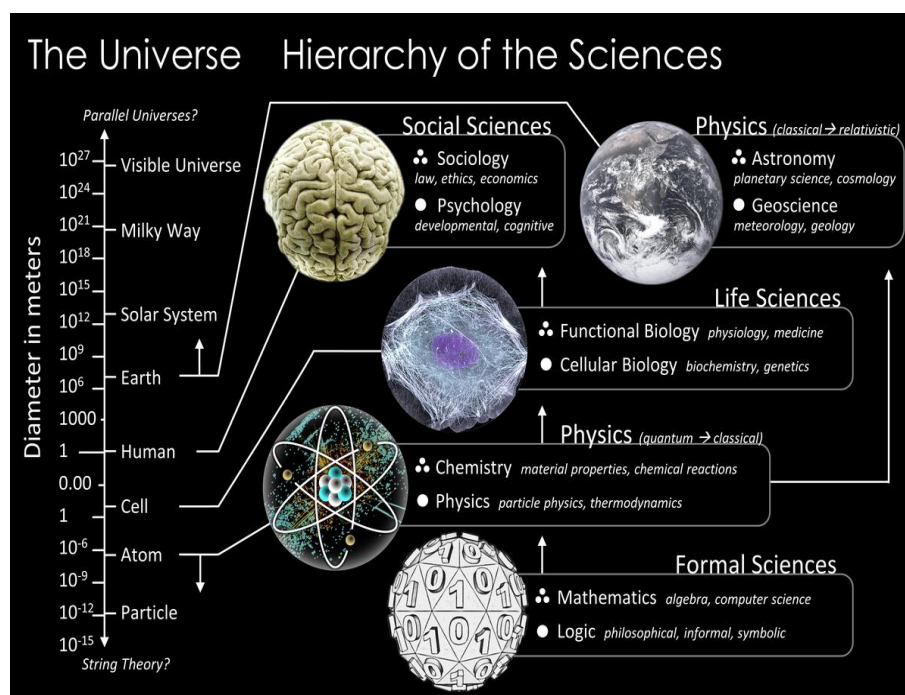


Fig.1: Universal Hierarchy of the Sciences

Source: Science - Simple English Wikipedia, the free encyclopedia.

According to Quora, Inc. (2023), basic science, for example, seeing how cells work, is research pointed towards understanding principal issues. Applied science, like the clinical field, is the use of fundamental logical information to take care of functional issues. Applied science utilises and applies data obtained through fundamental science. Basic science is driven by intellectual curiosity, with the primary objective of advancing our comprehension of the universe's workings. Researchers in the field of basic science conduct experiments, gather data, and develop theories that aim to uncover the underlying principles governing various phenomena. The knowledge gained through basic science is often theoretical in nature, laying the foundation for further scientific exploration and practical applications (National Academy of Sciences, 2021).

Effect of Motivational Teaching on Pupils Learning Interest

Motivation derives from the word 'motive,' which is the driving force within a person to carry out certain acts to attain certain goals (Cleopatra, 2015). It is the energy that powers the effort that makes a person perform activities to reach a goal. Motivational teaching is a pedagogical approach that places emphasis on engaging and inspiring students, encouraging them to take an active interest in their own learning. This approach seeks to kindle and sustain students' enthusiasm for education, making learning a meaningful and enjoyable experience. In this narrative, we will explore the impact of motivational teaching on pupils' learning interest, backed by updated references from the field of education. Motivational teaching is centered on creating a positive and engaging learning environment that fosters intrinsic motivation. Teachers make the content relevant to students' lives, showing how the material connects to real-world applications. This helps students understand the practical value of what they are taught (Ryan &Deci, 2020).

Providing students with some degree of choice and autonomy in their learning process can increase their motivation. When students have a say in what and how they learn, they often become more invested in the process (Reeve, 2016). Teachers help students develop a sense of competence by providing opportunities for success and acknowledging their achievements. A sense of accomplishment boosts motivation (Deci& Ryan, 2000). Creating a supportive classroom community where students feel connected to their peers and teacher can enhance motivation. A sense of belonging and positive relationships are motivating factors.

The effect of motivational teaching on pupils' learning interest is profound and far-reaching:

Enhanced Intrinsic Motivation: Motivational teaching techniques foster intrinsic motivation, where students engage in learning for the sheer enjoyment and fulfillment it brings. This intrinsic motivation is associated with sustained interest in learning (Ryan &Deci, 2020).

Improved Engagement: Students are more engaged and actively participate in class when they find the content and activities interesting. Their focus and attention increase, leading to deeper **Learning**

Positive Attitudes towards Learning: Motivational teaching nurtures positive attitudes toward learning, with students viewing education as a valuable and enjoyable endeavor. This positive outlook can have a long-lasting impact on their educational journey.

Long-Term Benefits: Students exposed to motivational teaching are more likely to develop a lifelong love for learning. They tend to carry their motivation and interest in learning beyond the classroom and into various aspects of their lives. Motivational teaching has a transformative impact on pupils' learning interest. When teachers employ motivational strategies, they create a learning environment where students are not only motivated to learn but also deeply interested in the subject matter. This kind of motivation extends beyond the classroom, leading to a lifelong pursuit of knowledge.

Types of Motivational Teaching Strategy in Basic Science and Technology

Motivational teaching strategies are crucial for engaging students and inspiring them to learn. These strategies help create a positive learning environment and encourage students to be more active and enthusiastic participants in their education:

➤ Reward:

According to Ekekwe (2008), reward is an important strategy that will help to motivate students' interest in science and mathematics education. Extrinsic motivators in the form of reward can help students who do not yet have powerful intrinsic motivation to learn. In a Basic Science and Technology classroom, the teacher can give students such simple but encouraging rewards, e.g., if a student tries to get the answer to a question correct, the teacher calls the student by her name and makes this remark: Chika, beautiful!, good girl!, class clap for her, clap again, and another clap. The praise, together with the applause, will boost Chika's morale and motivate her to learn more.

➤ Good Use of Instructional Material:

A good teacher should appreciate the need for instructional material in teaching and learning process. The concept of using instructional materials is to enhance the teaching and learning process. The concept of using instructional materials is to enhance the teaching and learning process. The National Teachers Institute Kaduna NTI (2012) defined instructional materials as all the resources a teacher uses to help him/her explain or elucidate the topic/content/subject to the learner so that he/she is able to fully comprehend the topic. The use of instructional materials helps to concretize the learning process. It makes the teaching-learning process easier; hence, a science teacher must always use them in the delivery of his lessons to enable the students to achieve the objectives of his lessons.

➤ Goal Setting:

Setting clear, achievable, and challenging goals helps motivate students. Encourage them to set their own learning goals, which can lead to a sense of ownership and increased motivation to achieve those goals.

➤ Positive Feedback and Encouragement:

Providing positive feedback and praise for students' efforts and achievements can boost their self-esteem and motivation. Acknowledge their progress and improvements, no matter how small.

➤ Active Learning:

Engage students actively in the learning process. Use techniques like group discussions, problem-solving activities, and hands-on experiments to make learning more interactive and enjoyable.

➤ Choice and Autonomy:

Allow students to have some control over what and how they learn. Giving those choices, within appropriate boundaries, can increase their sense of autonomy and motivation. For example, let them choose from a list of essay topics or decide on the order of assignments.

➤ Collaborative Learning:

Encourage peer-to-peer interactions and group work. Collaborative learning can foster a sense of belonging, promote cooperation, and motivate students to participate more actively.

➤ Real-World Applications:

Connect classroom learning to real-life applications and scenarios. Show students how the knowledge they acquire can be used in practical situations, which can boost their motivation to learn.

➤ Inquiry-Based Learning:

Encourage curiosity and critical thinking by posing questions and problems for students to investigate. Inquiry-based learning promotes a sense of exploration and discovery, driving motivation.

➤ Technology Integration:

Use educational technology and digital resources to make learning more engaging. Interactive apps, educational games, and multimedia content can capture students' attention and maintain their interest.

➤ **Celebrating Success:**

Recognize and celebrate students' achievements, both big and small. Publicly acknowledge their efforts, such as through certificates, awards, or classroom celebration.

➤ **Personalized Learning:**

Tailor instruction to students' individual needs and learning styles. When students feel that their unique characteristics are considered, they are more likely to be motivated to succeed.

➤ **Cultivating Growth Mindset:**

Teach students about the concept of a growth mindset, where they believe that their abilities can be developed through dedication and hard work. This mindset can lead to increased motivation and resilience in the face of challenges.

➤ **Emotional Intelligence:**

Promote emotional intelligence and create a supportive classroom environment. When students feel valued and emotionally safe, they are more likely to be motivated to learn.

➤ **Storytelling:**

Use stories and narratives to illustrate the relevance and importance of the subject matter. Storytelling can make abstract concepts more relatable and engaging.

Other techniques the teacher should employ during the period of classroom interaction are as follows:

- a) Jokes, short stories and questioning such that student's attention is assured.
- b) Classroom discussion aimed at involving the student actively in the teaching and learning science and mathematics
- c) Field trips to show students things in their natural environment
- d) Projects to enable student do it themselves and carryout activities independently or by consulting peers, parents, persons or even literature.
- e) Practical for the purpose of giving the students an opportunity to do science. To verify claims, analyze and synthesize scientific facts.
- f) Inquiry to help student discover and see relationship in what they discover and organize their new discoveries into meaningful ideas.
- g) Cooperative learning to enable the students cooperate with each other to perform or complete a particular task. Teacher should assign roles to students in Basic Science and Technology classroom to help them develop social skills and improve communication skills.
- h) Games and play to give enjoyment and satisfaction to the students. It will also make learners lively and actively involved in learning. It creates awareness, reinforcement and knowledge, it also provides an innovative educative entertainment and participatory approach to learning.
- i) Summary to present in a form which coincides with what has been taught for ease of reference and understanding.

Effect of Motivational Teaching Strategy and Learners Interest in Basic Science and Technology

The effect of motivational teaching strategies on learners' interest in basic science and technology is profound and can have a lasting impact on students' attitudes, engagement, and overall performance in these subjects. Motivational teaching strategies serve as a catalyst for fostering a genuine interest in basic science and technology, and here's how they influence learners:

➤ **Increased Engagement:**

When teachers employ motivational strategies, students are more engaged in the learning process. Whether it's through interactive activities, hands-on experiments, or real-world applications, students find the subject matter more interesting and relevant to their lives. This increased engagement leads to a deeper understanding of the topics and an eagerness to learn more (Ainley&Ainley, 2011).

➤ **Curiosity and Intrinsic Motivation:**

Motivational teaching strategies encourage curiosity and intrinsic motivation. Inquiry-based learning, where students are encouraged to ask questions and seek answers on their own, stimulates their natural curiosity. When students feel a sense of ownership over their learning, they are more likely to become intrinsically motivated to explore scientific and technological concepts (Deci et al., 2017).

➤ **Improved Academic Performance:**

Motivated students tend to perform better academically. They are more likely to invest time and effort into studying, completing assignments, and participating in class discussions. As a result, their comprehension and retention of basic science and technology concepts improve, leading to better academic outcomes (Gentry et al., 2019).

➤ **Long-Term Interest and Career Aspirations:**

Motivational teaching strategies can inspire long-term interest and career aspirations in basic science and technology fields. When students develop a genuine passion for these subjects, they are more likely to consider pursuing related careers in fields like science, engineering, or technology, ultimately contributing to the development of these industries (Maltese & Tai, 2011).

➤ **Self-Efficacy:**

Motivational teaching strategies contribute to the development of students' self-efficacy, or their belief in their own ability to succeed in science and technology. When students experience success, receive positive feedback, and have their achievements recognized, they become more confident in their abilities, further fueling their interest (Bandura, 1997).

➤ **Enhanced Problem-Solving Skills:**

Motivated learners tend to develop better problem-solving skills. They are more likely to embrace challenges and think critically when confronted with scientific and technological problems. This mindset can be invaluable not only in academic settings but also in real-world applications (Hmelo-Silver et al., 2007).

➤ **Promotion of Lifelong Learning:**

Motivational teaching strategies can instill a love for learning that extends beyond the classroom. Students who are motivated in basic science and technology are more likely to continue exploring these subjects independently, keeping their interest alive even after formal education (Hidi&Renninger, 2006).

Conclusion

The study concludes that motivational teaching strategies are a powerful catalyst for sparking learners' genuine interest in basic science and technology. These strategies, encompassing reward, good use of instructional materials, inquiry-based learning, and a supportive classroom environment, lead to increased engagement and improved academic performance. They also foster a long-term passion for science and technology, enhancing self-efficacy and problem-solving skills. Ultimately, motivational teaching not only empowers individual students but also contributes to a scientifically literate society, driving innovation and addressing global challenges through a well-prepared workforce.

Recommendations

1. Teachers should integrate real-world examples and applications of basic science and technology concepts into your teaching. Show students how these subjects are relevant to their daily lives and future careers.
2. Tailor teaching approaches to the individual needs and interests of students. Assess students' existing knowledge and preferences, and create personalized learning plans that incorporate topics and activities aligning with their interests within the realm of basic science and technology.
3. Teachers should encourage students to ask questions, explore problems, and conduct experiments. Create an environment that promotes curiosity and independent exploration.

REFERENCES

1. Ainley, M., & Ainley, J. (2011). Student engagement with science in early adolescence: The contribution of enjoyment to students' continuing interest in learning about science. *Contemporary Educational Psychology*, 36(1), 4-12.
2. Cleopatra, M. (2015). The effects of life style and learning motivation toward and Mathematics learning achievement. Retrieve from: <https://doi.org/10.30998/formatif.v5i2.336>
3. Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (2017). Motivation and education: The self-determination perspective. *Educational psychologist*, 52(2), 105-123.
4. Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (2017). Motivation and education: *The self-determination perspective. Educational Psychologist*, 52(2), 105-123.
5. Ekekwe, N. (2008) Strategies for Motivating Students' Interest. Unpublished Undergraduate Seminar. Ebonyi State University Abakaliki.
6. Gentry, M., Gable, R. K., & Rizza, M. G. (2019). Students' motivation and teachers' instructional practices: The importance of a student-centered, cooperative instructional approach. *Journal of advanced academics*, 30(1), 7-27.
7. Gentry, M., Gable, R. K., & Rizza, M. G. (2019). Students' motivation and teachers' instructional practices: The importance of a student-centered, cooperative instructional approach. *Journal of Advanced Academics*, 30(1), 7-27.
8. Graham, C. R. (2019). Blended Learning Systems. In M. G. Moore (Ed.), *Handbook of Distance Education* (4th ed., pp. 335-350). Routledge.
9. Ivowi, U.M.O. (2011) "Sustaining Students' Interest in Science: A Perspective for Curriculum and Instruction". Quarterly Quest Lecture at School of Science. Tai Solarin College of Education Ijebuode, Ogun State. 30 May.
10. Maltese, A. V., & Tai, R. H. (2011). Pipeline persistence: Examining the association of educational experiences with earned degrees in STEM among US students. *Science Education*, 95(5), 877-907.
11. National Academy of Sciences. (2021). Role of Basic Research in Science. Available at: <https://www.nap.edu/read/11715/chapter/1>
12. National Teacher's Institute Kaduna – Nigeria (2012) Manual for the Re-Training of Junior Secondary School Teachers Millennium Development Goals (MDGs) Project. Kaduna: NTI Press
13. Quora. Inc. (2023) What is basic science? Available at: <https://www.quora.com/What-is-basic-science>
14. Reeve, J. (2016). Autonomy in Education: An Overview. Retrieve from: *Theory and Research in Education*, Pp. 14(4), 372-382.

15. Ryan, R. M., &Deci, E. L. (2020). Intrinsic and Extrinsic Motivation from a Self-Determination Theory Perspective: Definitions, Theory, Practices, and Future Directions. Retrieve from: *Contemporary Educational Psychology*, Pp. 61, 101860.
16. Simple Wikipedia (2023) Science - Simple English Wikipedia, the free encyclopedia Available at:
https://www.google.com/imgres?imgurl=https%3A%2F%2Fupload.wikimedia.org%2Fwikipedia%2Fcommons%2Fthumb%2F7%2F75%2FThe_Scientific_Universe.png%2F640px-The_Scientific_Universe.png&tbnid=W136lxhJvUUExM&vet=12ahUKEwiGhqWSvJaCAxW2rIkEHQPWdmQQMygGegQIARBP..i&imgrefurl=https%3A%2F%2Fsimple.wikipedia.org%2Fwiki%2FScience&docid=sqRqnw4F3zEIDM&w=640&h=427&q=concept%20of%20basic%20science%20wikipedia&hl=en&ved=2ahUKEwiGhqWSvJaCAxW2rIkEHQPWdmQQMygGegQIARBP.
17. Tomlinson, C. A. (2017). How to Differentiate Instruction in Academically Diverse Classrooms. ASCD.
18. Uppsala University (2023) what are the Basic Sciences? Available at:
<https://www.isp.uu.se/basic-sciences/#:~:text=The%20basic%20sciences%20are%20defined,which%20natural%20resources%20are%20transformed>.