

Teachers' Attributes and Students' Level of Motivation in Science

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Abstract

There are many reasons why Science students find Science subjects difficult, leading to low engagement in the classroom and poor academic performance. This study aimed to determine the relationship between the teachers' professional attitudes and values, level of professional knowledge and skills, and the students' level of motivation in Grade 9 High School students for the School Year 2022-2023. The researcher used the stratified random sampling technique in which there were one hundred forty-five (145) respondents. The researcher used a non-experimental quantitative research methodology, specifically, a descriptive-correlational technique. A validated and reliability-tested survey questionnaire was the primary data collection instrument. The collected data were analyzed and interpreted using appropriate statistical methods such as frequency of distribution, mean, standard deviation, percentage, and Pearson Product-Moment Correlation. The study revealed that the personal attributes of the teachers in terms of spending and being a positive person could lead to large gains in students' motivation and achievement. Hence, by relating various disciplines to real-life circumstances, efficient classroom management makes the classroom the ideal learning environment where students can engage with their studies and work to the best of their abilities. The study also revealed that when students find learning exciting and pleasurable, they are more engaged when teachers attempt to arouse their innate curiosity about Science by making connections between Science and everyday life. As a result, teachers' use of pedagogies significantly impacts students' motivation levels. Thus, the research found a substantial correlation between teachers' attributes and students' motivation levels.

Keywords: students' motivation, teachers' attributes, professional knowledge and skills.

1. Introduction

The study of Science is regarded as one of the most difficult academic disciplines. There are many reasons why Science students find Science subjects difficult, leading to low engagement in the classroom and poor academic performance. One problem is that Science education places a high cognitive and psychological demand on students. This makes the effort involved in learning Science much more significant than other academic subjects. While Science requires memorization and abstract thinking skills, students need to be highly motivated and resilient to be successful (Fagerberg, 2022).

Motivation increases students' learning (Johnson, 2017). Students' learning may be impacted by outside variables like prizes or incentives, but it can also grow as a result of their own intrinsic motivation to perform or complete a task. There are others besides students who can determine how motivated they are to learn. With motivating assistance, teachers play a crucial role in enhancing students' learning. There are many studies which confirm that there is positive relationship between motivation and achievements and success of students (Steinmayr et al., 2019). Motivation not only enhances the academic performance, it also links with achievements, getting command on the subject, enhancing personal responsibility and eventually achieving learning (Sivrikaya, 2019).

Hyatt (2017) suggested that teachers should work to foster students' inherent scientific interest. They can do this by relating Science to the real world. They can think of exploratory and innovative opportunities

to help them better grasp Science. Most schools conduct events, such as a Science Fair. The students will be inspired to conduct intriguing experiments and develop an interest in Science if there are more opportunities.

Teachers who impact the educational process and serve as exceptional role models for students by exhibiting their own personal attributes, expertise, unique abilities, attitudes, and behaviors play a crucial role in the success of their charges. As a result, strengthening the teaching profession will immediately increase the effectiveness of the educational system (Maureen, 2021). For this reason, the investigation of teacher's attributes that influences the students' level of motivation is of great value.

The study was anchored on the theory of attribution Djigic (2018). Djigic emphasized that classroom management links several aspects of teachers' behavior intended to produce a stimulating learning environment, as well as teachers' personality traits, skills, and beliefs, with processes in the classroom and their impacts.

Under Djigic's Theory, classroom management includes managing learning activities, managing time and space, using teaching methods, working forms, teaching materials, and equipment, managing student behavior, and helping students grow personally. Different facets of classroom management could be observed through three broad categories: personality, instruction, and discipline. It is feasible to identify recurring patterns of the teacher's behavior in each of these three categories that correspond to various classroom management styles. A quality teaching environment is ensured, unwanted student behaviors are reduced, and student achievement is significantly impacted by effective classroom management.

A study entitled Research on the Relationship between Classroom Climate and Learning Motivation of College Students: Mediating Effect of Self-efficacy was also anchored on this theory of which the results showed that classroom climate, specifically the teacher support and classmate relationship had a significant and positive impact on learning motivation like learning interest, self-development, social relations, external expectations. In addition, self-efficacy completely mediates the relationship between students' relationships and learning motivation. There is some mediation effect on the relationship between teacher support and learning motivation.

2. Methodology

This study employed a descriptive-correlational design. According to Ivy Panda (2022), descriptive correlational design is used in research studies that provide static pictures of situations and establish the relationship between different variables. A descriptive design was used to determine the students' level of motivation considering the level of professional attitudes and values of the teachers and the level of professional knowledge and skills of the teachers as perceived by the students. In addition, correlational design was used to ascertain whether there is a significant relationship between students' level of motivation and the teachers' professional attitudes, values, and professional knowledge and skills.

The statistical tools used in the analyses of the data were the following: Mean and Standard Deviation were used for Problems 1, 2, and 3 to determine the level of professional attitudes and values of the teachers, the level of professional knowledge and skills of the teachers, and the level of motivation of the students. Pearson Product-Moment Correlation was utilized for Problem 4 to ascertain how the dependent and independent variables are related.

3. Results and Discussion

Problem 1. What is the level of personal attributes of the teachers as perceived by the students in terms of:

- 1.1 Spending Time with Students; and
- 1.2 Being a Positive Person?

Table 1*Professional Attitude in Terms of Spending Time with Students*

Indicators	Mean	SD	Description	Interpretation
Spending Time with students				
My teacher				
1. is being interested in our privacy, paying attention to our problems and helps us.	4.00	.86	Agree	High
2. is being fair, not discriminating us.	4.30	.90	Strongly Agree	Very High
3. is caring for us, valuing us, encouraging us to participate.	4.43	.78	Strongly Agree	Very High
4. is allocating time for us outside regular course time, replying to our questions.	4.18	.88	Agree	High
5. is motivating us for success/inspiring us.	4.63	1.53	Strongly Agree	Very High
6. is showing affection like father or mother, seeing us like his/her own child.	3.89	1.04	Agree	High
7. is trusting us.	4.16	.96	Agree	High
8. is giving advice/advising effectively to us.	4.38	.72	Strongly Agree	Very High
9. is not offending us.	4.00	1.03	Agree	High
Overall Mean	4.22	.97	Strongly Agree	Very High

Note: 4.21-5.0 Very High; 3.41-4.20 High; 2.61-3.40 Moderately High; 1.81-2.60 Low; 1.0-1.80 Very Low

Table 1 presents the level of personal attributes of the teachers in terms of spending time with students as perceived by the students. The data in the table indicates that it has an Overall Mean of 4.22 with an SD of .97, which is described as Strongly Agree and interpreted as Very High. This suggests that the teachers find time to associate with their students, which is an essential trait that a teacher must possess so that the students would not be apprehensive in approaching their teachers, especially if they have concerns about their academic status. Moreover, students spend more hours in school, which is enough to build relationships with their teachers. Sparks (2019) stressed that an average student spends 1,000 hours with their teacher each year. That is enough time to build a relationship that could ignite a student's lifetime love of learning and enough time for the dynamic to go off the rails.

The table also presents the indicator rated high by the students. The indicator, *My teacher is motivating us for success/inspiring us*, got the highest Mean rating of 4.63, with an SD of 1.53, described as Strongly Agree and interpreted as Very High. This means that the teachers are good motivators for the students to succeed in all their undertakings in school. As a motivator, the teacher has the task of igniting student interest, which is very important because interest in learning directly affects learning achievement. Numerous studies have shown the power of belief, and teachers can influence their students' beliefs to a great extent. Exceptional teachers constantly encourage students and have the power to change their mindset (Allison Academy, 2021).

Furthermore, the indicator, *My teacher is showing affection like father or mother*, seeing us like his/her own child, obtained the lowest Mean rating of 3.89 with an SD of 1.04, which is described as Agree and interpreted as High. This entails that although teachers are considered surrogate parents, they have to establish the gap between their students, especially since there are laws on bullying that teachers should be careful of. When teachers target students, they often feel shamed and powerless. In many cases, they cannot establish positive relationships within the school.

Teacher harassment can also be contagious, indicating to students that a particular individual's bullying is appropriate and leaves the victim open to more abuse. The most unfortunate aspect of bullying

behavior in teachers is how easily it persists. Almost always, disrespectful teachers disguise their mistreatment of students as a necessary component of their legitimate job duties and use the rhetoric of motivation or punishment to support their conduct. If accused, offenders may downplay or deny the behavior and argue that it was only a joke or a misunderstanding. Ignoring the issue of teacher bullying makes it worse by granting permission to any teacher who feels they can treat students whatever they want (Mcevoy, 2019).

Table 2*Personal Attributes in Terms of Being a Positive Person*

Indicators	Mean	SD	Description	Interpretation
Being a Positive Person				
My teacher				
1. gives a positive energy and having a smiling face.	4.13	.97	Agree.	High
2. is being warm, affectionate, and friendly.	4.08	.96	Agree	High
3. is being understanding, tolerant and affectionate.	4.13	.98	Agree	High
4. is being determined and stable.	4.20	.91	Agree	High
5. is being energetic.	3.93	.93	Agree	High
6. is being trustable.	4.08	.99	Agree	High
7. is being merciful.	3.89	1.02	Agree	High
8. let us adopt reading as a habit.	3.91	.89	Agree	High
9. has higher self-confidence.	4.28	.84	Strongly Agree	Very High
10. is being forgiving.	4.32	.84	Strongly Agree	Very High
Overall Mean	4.09	.93	Strongly Agree	High

Note: 4.21-5.0 Very High; 3.41-4.20 High; 2.61-3.40 Moderately High; 1.81-2.60 Low; 1.0-1.80 Very Low

Table 2 indicates the level of personal attributes of the teachers in terms of being a positive person as perceived by the students with an Overall Mean of 4.09 with 0.93=SD, which is described as Strongly Agree, and is interpreted as High. This means that when teachers consciously work and become familiar with each of their students, it can help students feel an impression of connectedness to the school and an overall sense of belonging—which can subsequently lay the groundwork for academic achievement. Cooperation and participation in the classroom enhance when there are good teacher-student interactions. They also contribute to a welcoming, inclusive school climate that promotes equity, social and emotional learning, and improved student outcomes. Besides, how students interpret their interactions with their teachers can have a lasting impact. Perspective-taking can help teachers recognize each student's strengths. In addition, it would lead to a deeper understanding of the daily challenges they experience. Cultivating caring relationships is essential, and teachers must also convince students that they can learn and succeed. Small social-psychological interventions that focus on changing students' thoughts, feelings, and beliefs in and about the school can significantly improve student achievement for every student (Nishioka, 2019).

Moreover, the indicator, *My teacher is being forgiving*, has the highest Mean rating of 4.32 with an SD of 0.84, which is described as Strongly Agree and interpreted as Very High. According to Lynch (2019), all students would make mistakes from time to time. They are young and still learning lots of new things through their errors. So, as educational leaders, teachers must ensure they are forgiving when students make mistakes to solve problems more efficiently. Hence, if a teacher is patient with students and encourages them to accept lessons from their blunders, they would feel more comfortable approaching them and talking to them if serious problems arise. If teachers do not allow them to fix and continually punish their destructive behaviors, they would learn to fear them. A teacher should be someone that students feel comfortable

approaching when needed. Thus, if a teacher is not forgiving to them, then when they need some advice or help in class, they would not feel comfortable putting up extra effort to obtain it.

Moreover, forgiveness is also an opportunity for students to solve problems independently. Whenever they commit an oversight or do something bad, please encourage them to acknowledge what they did wrong so that they can figure out ways to improve this behavior. The use of forgiveness is a learning experience to help improve their problem-solving skills as well.

Other than that, the table also demonstrates the indicator, *My teacher let us adopt reading as a habit*, got the lowest Mean of 3.91 with an SD of 0.89, which is described as Agree and interpreted as High. Perhaps the most important basic abilities is reading that students must learn to succeed. It is not solely a crucial professional competency, but also a way to enjoy creative, informative, and inspiring works of literature that enriches life experiences. Though reading is the backbone of education, sadly, most of today's students prefer playing video games or watching television instead of reading a book (Singh, 2023). The main reason is that modern parents must concentrate more on developing students' reading habits. Like any other capacity, establishing a reading habit demands time and effort. Growing an appreciation of reading in students can be a challenging endeavor for anyone, but with the precise use of the right techniques, one can easily make their student into a proficient reader.

Reading aloud to students at home from an early age serves as vital for fostering reading habits in students. Besides, it is widely accepted that parents have a significant role in their children's education and influence their learning and development. Considering that reading comprehension skills acquired in primary school years affect all learning experiences of individuals throughout their lives, it can be argued that communication between families is of the utmost importance to the development of primary school students' reading comprehension skills (Çalışkan, 2022).

Table 3

Summary Table Personal Attributes

Attributes	Mean	SD	Description	Interpretation
Spending Time with students	4.22	.97	Strongly Agree	Very High
Being a Positive Person	4.09	.93	Agree	High

Note: 4.21-5.0 Very High; 3.41-4.20 High; 2.61-3.40 Moderately High; 1.81-2.60 Low; 1.0-1.80 Very Low

Table 3 presents the summary of personal attributes of the teachers as perceived by the students. The data in the table indicates that, the indicator, *Spending Time with Students*, got the highest Overall Mean of 4.22 with .97=SD, which is described as Strongly Agree and interpreted as Very High. This suggests that teachers as a motivator plays role to provide stimulation and encouragement to increase students' interest and motivation. Interests are the awareness, the desire and attention of someone toward a certain object associated with interest is a preference in an activity which is implemented through active participation. Therefore, interest is important to be enhanced because learning interest influences learning achievement them that is associated with strong feelings. To increase students' interest in learning, there are some things that teachers can do, that is to convey the purpose of learning in accordance with the intellectual level of the students, because the students' understanding of the learning objectives can generate interest in learning to explain the benefits of learning the subject matter (Tambunan, 2018).

Problem 2. What is the level of professional knowledge and skills of the teachers as perceived by the students in terms of:

- 2.1 Knowledge of the Subject Matter;
- 2.2 Classroom Management; and
- 2.3 Used of Appropriate Pedagogies?

Table 4

Summary Table Professional Knowledge and Skills

Attributes	Mean	SD	Description	Interpretation
Knowledge of the Subject Matter	4.18	.84	Agree	High
Classroom Management	4.15	.92	Agree	High
Use of Appropriate Pedagogies	4.23	.87	Agree	High
Note: 4.21-5.0 Very High; 3.41-4.20 High; 2.61-3.40 Moderately High; 1.81-2.60 Low; 1.0-1.80 Very Low				

Further, the indicator, *Use of Appropriate Pedagogies*, got the highest Mean rating of 4.24 with .86=SD, which is described as Agree and interpreted as High. Science is the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence. From learning about the moon's phases to the movement of plate tectonics. One of the most significant benefits of learning Science is that students can and will always continue to learn more —because they can find Science in their own backyard, in their home, and everywhere throughout the world. Science is fascinating because it helps humanity see things from different perspectives, solves critical problems, creates open-minded debate and collaboration, and provides us with growing knowledge and opportunities (Shulman, 2022).

Hence, pedagogy in education can benefit students with special needs to acquire knowledge. Using suitable pedagogies, teachers can help special students to learn and encourage them to adopt mainstream learning communities. Practical work in Science could develop strategies to support effective teaching and learning in science lessons. It is really important that science teachers are sceptical about the benefits of practical work. Without practical work, science is just a collection of abstract ideas without a clear explanatory purpose. However, this doesn't mean that the substantive ideas (facts) of science are best learnt through whole-call experimentation. A demonstration may deliver a much clearer understanding of a scientific concept. Similarly, an enquiry-based approach may not be the best forum to teach the scientific knowledge needed to understand a particular concept, but it could be a great opportunity to motivate students or to encourage them to ask questions (Green, 2023).

Problem 3. What is the students' level of motivation in terms of:

- 3.1 Intrinsic Motivation;
- 3.2 Self-determination;
- 3.3 Self-Efficacy;
- 3.4 Career Motivation; and
- 3.5 Grade Motivation?

Table 5

Summary of Students' Motivation

Variables	Mean	SD	Description	Interpretation
Intrinsic Motivation	3.96	1.01	Agree	High
Self-Determination	3.77	0.81	Agree	High
Self-Efficacy	3.59	1.06	Agree	High
Career Motivation	3.82	0.98	Agree	High
Grade Motivation	4.13	1.02	Agree	High
Overall Mean	3.85	0.98	Agree	High
Note: 4.21-5.0 Very High; 3.41-4.20 High; 2.61-3.40 Moderately High; 1.81-2.60 Low; 1.0-1.80 Very Low				

Table 5 reveals the summary of students' level of motivation. It has an Overall Mean of 3.85 with 0.98 SD, described as Agree and interpreted as High. This means that the students are both intrinsically and extrinsically motivated. Further, this suggests that the teachers can design classroom activities that will address the motivators of the students. Binns (2023) pointed out that by curating a lesson plan that makes room for student motivation, teachers can witness the positive effects of happier students. From cutting down study time to unlocking better results, motivational activity ideas will benefit teachers and students.

Additionally, the table indicates that Grade Motivation got the highest Mean among the five-level of motivations of 4.13 with an SD of 0.98, which is described as Agree and interpreted as High. This implies that the students' motivation comes from the outside of them. Thus, they are extrinsically motivated and exert much effort to get high grades. Extrinsic motivation is fuelled by advantages gained from outside sources. These can be tangible, like cash or grades, or immaterial, like admiration or renowned (Cherry, 2022).

The table also reveals the variable self-determination that obtained the lowest Mean of 3.77 with SD=0.81, which is described as Agree and interpreted as High. This means the learner needs a little push to be more motivated and excel academically. Many people perceive Science to be something challenging and hostile. In shifting this perspective, the teachers can have a big impact. They can discuss Science in fascinating manners and explain to students how it has altered the world. By exhibiting unique scientific experiments, they can inspire the students. A student is more likely to attempt to imitate a teacher who is educated and enthusiastic about Science. Teachers should get students involved in Science early and make it fun and exciting. They can show hands-on experiments to grow their interest in them. They should show the students how Science is used in everyday life (Hyatt, 2017).

Problem 4. Is there a significant relationship between the students' level of motivation and the teachers' professional attitudes and values and professional knowledge and skills?

Table 6

Correlation Analysis between Teacher's Attributes and Students' Motivation in Science

Variables	R-value	P-value	Interpretation
Spending Time with Students	.419**	.000	Significant
Being a Positive Person	.453**	.000	Significant
Knowledge of the Subject Matter	.472**	.000	Significant
Classroom Management	.474**	.000	Significant
Use of Appropriate Pedagogies	.422**	.000	Significant

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6 demonstrates a correlation analysis between teacher's attributes and students' motivation in Science. It was demonstrated that there was a substantial relationship between the students' level of motivation and the teachers' professional attitudes and values, and professional knowledge and skills. The null hypothesis is rejected since the computed p-values of spending time with students, being a positive person, knowledge of the subject matter, classroom management, and use of appropriate pedagogies is 0.000, demonstrating that there is an intense connection between teacher's attributes and students' motivation in Science.

Hence, students who are motivated, learn more. Students' learning may be influenced by external factors like prizes or incentives, but it can also grow as a result of their own intrinsic motivation to perform or complete a task. The degree to which students are motivated to learn is not the only factor. Through motivation, teachers play a crucial part in improving students' learning. By encouraging students' autonomy, relevance, relatedness, competency, instructors' interests in the subject, and self-efficacy, teachers can help students become more motivated to learn. Regardless of whether it is intrinsic or extrinsic, it is crucial for

teachers to foster an environment where students are motivated to study (Johnson, 2017).

Consequently, optimism fuels the achievement of long-term goals. Teachers with a positive outlook on the future work harder to accomplish their objectives. Their students expend more effort on achieving common goals. Students feel motivated and uplifted when their teachers are upbeat. Classes can be enjoyable when teachers push themselves and inspire all students to believe in themselves (Paxton, 2023).

Moreover, educators believe that a good relationship with a student is close and dependable but not unduly. A teacher who cares about students they teach believes that every child can learn differently and at different rates, sets high expectations, is warm and trusting, and strives to keep the relationship conflict-free. Moreover, students told researchers that good teachers listen to and take a personal interest in students' lives. They show respect, value each student's individuality, and are kind and polite. An understanding teacher offers second opportunities and provides candid comments. They support students with their academic work, effectively run the classroom, and, perhaps most importantly, they organize enjoyable activities (Eva, 2022).

Typically, the main goals of teacher development programs are to enhance pedagogy and classroom teaching strategies while also developing 21st-century skills like creativity and cooperation. As important as instructional skill is subject-matter expertise. After all, instruction involves interaction between the instructor, the student, and the material being taught. To effectively instruct students, teachers must possess a thorough understanding of their subject area as well as pedagogy, curriculum, student behavior, learning objectives, and results (Sharma, 2023).

This implies that although Science is considered one of the toughest disciplines to truly understand, as stated by Fagerberg (2022), Cooperation and engagement in the classroom strengthen when there are good teacher-student interactions. Likewise, a study conducted by De Guzman (2022) revealed an association between the students' motivation towards Science, enjoyment of Science, and future orientation towards Science, and the frequency in which various teaching and learning activities occur in the classroom.

4. Conclusions and Recommendations

In the light of the above-cited findings, the following conclusions are drawn from the study:

1. The study revealed that the personal attributes of the teachers in terms of spending and being a positive person could lead to significant gains in students' motivation and achievement.
2. By relating various disciplines to real-life circumstances, efficient classroom management makes the classroom the ideal learning environment where students can engage with their studies and work to the best of their abilities.
3. The study found that when students find learning exciting and pleasurable, they are more engaged when teachers attempt to arouse their innate curiosity about Science by making connections between Science and everyday life.
4. Study results showed a substantial correlation between teachers' professional attitudes, values, knowledge, and skills and students' motivation levels. As a result, teachers have unique teaching philosophies based on their perceptions of their roles in the teaching and learning process, which significantly impact students' motivation levels.

The recommendations indicated below are founded on the facts and conclusions already mentioned:

- 1) Although teachers are second parents, they are encouraged to still possess high ethical standards and honorable conduct, adhering to fundamental values such as integrity, honesty, and respect.
- 2) Teachers are encouraged to employ more of the reward system to stimulate learning and motivate good behavior. Hence, rewarding students encourages and endorses school efforts, leading to

improved student outcomes.

3) Students are encouraged to know learning strategies. Consequently, something other than what works for one student may work for another. Students should keep trying till they find what works best for them when studying.

4) Competition can motivate attention, physical effort, and learning. Hence students should be competitive in Science exams. Students may be pushed to work much harder on their assignments than they would otherwise feel driven to do so by the social motivator of competing against others.

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