



(RESEARCH ARTICLE)



A thematic analysis on understanding the mastery of knowledge sharing and outcome expectations on student academic performance in science at Junior High School Level

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Abstract

Learning Science, Knowledge Sharing, Outcome Expectations, and Academic Performance. Participants predominantly express a favorable stance towards learning science, which is enjoyable and challenging, though they face hurdles such as language barriers and stress. Underlining the need for supportive learning conditions, the study reveals that knowledge sharing, driven by intrinsic motivation, aids in addressing gaps and enhances academic performance. Anticipations in science education significantly influence students' motivation and academic success, as seen through the value placed on control, focus, and the functional role of science in daily life. Improved academic performance, attributed to overcoming challenges, motivation, and a positive shift in attitude, underscores the significance of collaborative learning and individualized approaches.

These findings emphasize the intricate interplay among positive attitudes, knowledge sharing, expectations, and academic achievement in shaping students' experiences in science education. Teachers and educational institutions can leverage these insights to refine teaching methods and create inclusive environments that foster student success in science education while addressing obstacles like language barriers and stress.

Keywords: Knowledge-sharing; Expectations; Outcomes; Motivation; Collaborative learning

1. Introduction

The research titled "A Thematic Analysis on Understanding the Influence of Knowledge Sharing and Outcome Expectations on Student Academic Performance in Science" is a study aimed at investigating the intricate relationship between knowledge sharing and outcome expectations on the academic performance of students in the field of science. This research delves into the dynamic interplay of two critical factors that can significantly impact a student's success in science education. That will focus on the results of knowledge sharing, outcome expectations, and academic performance of junior high school learners and teachers.

Knowledge sharing refers to students actively exchanging information, insights, and ideas with their peers, teachers, and other educational resources. It involves collaborative learning, discussions, and sharing of study materials, which have become increasingly prevalent in modern educational settings. The role of knowledge sharing and outcome expectations in predicting student academic performance, shedding light on the complex interplay between these variables. Understanding the motivations and behaviors of students in the learning process is critical for academic achievement. Recent studies in learning sciences highlight the importance of promoting students' well-being, healthy development, and transferable learning (Wang et al., M. (2022)). The role of peer groups is significant in students' social,

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emotional, and academic development. They understand the prospects and challenges of group productivity to improve academic performance (Adeyemi et al., 2019).

Science education has a broad scope in the learning process and multiple skills to develop while the learning process is ongoing, peer tutoring in science advocates constructivist and behaviorist ideas of learning. Peer tutoring is more effective at the high school level; it is a compelling cognitive domain in science education. Ullah, Tabassum, Kaleem (2018) Students often need help understanding and applying scientific knowledge. Knowledge sharing is crucial in acquiring knowledge and impacting individual student performance (Chordkunpan & Worasatepongsa, 2020). Sharing expertise has a significant positive effect on student academic performance. Knowledge-sharing is related to competence and substantially impacts academic achievement (Rasto et al., 2021). Knowledge interplay between sharing outcomes and expectation plays an essential role in Individual knowledge-sharing behavior and significantly influences the behavior of others and the recognition received by the sharer. Furthermore, the knowledge-sharing behaviors of others positively contribute to group performance, while recognition from others enhances the social status of the sharer (Jia et al.; L., 2023).

However, teachers' and peers' support and encouragement can significantly impact students' outcome expectations. Positive peer interactions, including knowledge sharing, create a supportive learning environment that fosters academic success (Membiela, P., Vidal, M., Fragueiro, S., Lorenzo, M., García-Rodeja, I., Aznar, V., Bugallo, A., & González, A., 2021). Previous studies have shown that learning engagement can be influenced by factors that support learning motivation (Liu et al., 2018). According to Yang et al. (2021), when teachers offer support, it can encourage students to actively participate in academic activities and enhance their social interactions and intellectual abilities within the classroom setting, Huang et al. (2022) noted. The research findings of An, F., Yu, J., & Xi, L. (2022) showed that perceived teacher support is significantly associated with learning engagement. Learning motivation plays a mediating role in the relationship between perceived teacher support and learning engagement.

Furthermore, junior high school is a critical stage in students' academic development, and their experiences with knowledge sharing and outcome expectations can significantly impact their academic performance in science. This review underscores the importance of these factors in shaping the educational landscape and calls for further research that delves into the complex interplay between knowledge sharing, outcome expectations, and academic success at this educational level. Educators and administrative staff can develop more effective strategies to support students in their science education journey by understanding these dynamics in-depth.

This research aims to analyze patterns and methods of students' knowledge-sharing, examine the influence of outcome expectations on educational efforts, assess the impact of knowledge-sharing outcome expectations on academic performance, and evaluate perceptions of knowledge-sharing's effect on academic success.

The findings from this research have significant implications for designing more effective science education programs and strategies to equip students with the tools they need to succeed in this critical field.

2. Research Methodology

2.1. Research design

The study will use a qualitative research design, specifically a thematic data analysis and content analysis approach. Both approaches are suitable for exploring the subjective experiences and meanings attributed to knowledge sharing and outcome expectations in science education.

2.2. Participant Selection

Purposive sampling will select participants with rich, diverse, and relevant perspectives. Participants will include students from different grade levels, backgrounds, and levels of academic performance in science.

2.3. Data Collection

2.3.1. In-depth Interviews

Semi-structured interviews are conducted with selected participants. This discussion will allow the contributor to share their experiences, beliefs, and behaviors related to knowledge sharing and outcome expectations in science.

2.3.2. Observations

Classroom observations will be carried out to provide context and gather data on knowledge-sharing activities, interactions, and classroom dynamics. It will complement the interview data.

2.4. Data Analysis

2.4.1. Thematic Analysis

Data analysis will involve identifying themes and patterns in the interview transcripts. It involves coding data, categorizing themes, and looking for commonalities and variations in participants' experiences.

2.4.2. Coding and Theme Development

Interpret the themes, concluding the influence of knowledge sharing and outcome expectations on academic performance.

2.4.3. Triangulation and Validation

We compared the theme's findings from multiple sources (interviews) to validate the themes.

2.5. Ethical Consideration

A consent letter will be "A Thematic Analysis on Understanding the Mastery of Knowledge Sharing and Outcome Expectations on Student Academic Performance" from all participants, clearly outlining the purpose and nature of the study and their right to withdraw at any point. Participant confidentiality and invisibility will be maintained by assigning pseudonyms and securely storing all data. This research adheres to ethical guidelines and obtains necessary approvals from the relevant ethics committees or institutional review boards.

2.6. Limitations of the study

The study may face limitations related to potential researcher bias, the particular nature of qualitative research, and the contextual specificity of findings.

3. Results and Findings

The analysis procedure in four themes

3.1. Positive attitude toward learning science

Almost all participants responded that a positive attitude in learning science has an enormous impact. The participants stated that learning sciences is enjoyable and challenging—the theme of mixed experiences the respondents encountered and success in science education during their junior high school. Participants express an interest in different branches of science and appreciate the diversity of scientific topics they can explore. The previous study, including a study by Savelsbergh et al. (2016) and another by Doğan, Y., Batdı, V., & Yaşar, M. D. (2021), has revealed that distinct pedagogy processes, such as inquiry-based understanding, technology-based learning settings, and collaborative learning, can positively influence students' attitudes toward science. The study results imply that teachers can use these strategies to help students devise a more positive attitude toward science. Learners enjoy the experiences with junior high science education even though it is a roller coaster ride, which means they have faced challenges and engaging aspects. Students' attitude reflects, with more positive attitudes tend to perform better academically in science subjects based on the study of Mao, P., Cai, Z., He, J., Chen, X., & Fan, X. (2021).

On the other hand, one of the research participants said that language is one of the communication barriers that hinders them from expressing their ideas in English. Stress and coping as a study theme caused stress in their studies, particularly during class presentations. It highlights the emotional aspects of their educational journey.

Furthermore, the academic success and resilience theme signifies the respondent's ability to overcome challenges and finish their class reporting. It reflects their determination and hard work, demonstrating their resilience in academic difficulty.

3.2. Knowledge Sharing

The learner participants emphasize cooperation with peers, reflecting a willingness to collaborate and share knowledge with classmates and peers. Knowledge-sharing science learners are actively involved in their learning process, achieving sustainable acquisition using their motivation and interest to explore science as a learning area (Petrescu et al.) (2018). The themes indicate that participants actively engaged in knowledge sharing by cooperating with classmates or peers in a group activity as a group presentation; the in-depth definition of knowledge and sharing is the development of cooperative skills, highlighting the value of collaborative learning experiences in science and student experiences in the school during classes. (Spires¹Himes¹and Krupa²) (2022). However, the other participants' active engagement in knowledge-sharing with classmates and peers due to their intrinsic interest in science, their willingness to share self-acquire knowledge from research, and their active participation in school-related activities promote knowledge-sharing. Their intrinsic motivation to participate drives them to engage in these activities, highlighting their commitment to collaborative learning and knowledge exchange. Despite challenges, their motivation signifies their determination and commitment to their education.

Furthermore, sharing knowledge with peers in science classes is essential, which can positively influence their understanding of science topics. It is primarily attributed to the potential for peers to correct misunderstandings, which in turn, may lead to improvements in academic performance. One of the respondents expressed her thoughts on acknowledging knowledge gaps; this theme of recognizing them indicates that the respondents are aware of the limitations in their understanding of science. This theme underscores the importance of self-awareness and a desire to fill the gaps. Teacher influence: These themes reflect the teacher's influence in guiding the learning journey. Teachers significantly contribute to aiding students in exploring and comprehending science. Embracing science education and cultivating collaborative teaching partnerships to promote social networks is a drive for teaching reform in science education (A.K. et al. et al., 2022). This theme, science education, has developed a positive attitude toward learning science. Learner respondents viewed science education as integral to their broader learning experience. The themes of personal development and practical application highlight that the learners are concerned with theoretical knowledge and applying science practically in real-world situations. They aim to apply their knowledge in a meaningful way.

On the other hand, one of the respondents emphasized the benefit of knowledge sharing and expansion of learning, wherein they have gathered more information, which has expanded their learning and improved their understanding of science topics. The participants recognize that their active involvement in academic performance is attributed to the benefits of sharing knowledge. They consider the beneficial impact of knowledge sharing. This theme suggests that the respondents highly value sharing with peers; they see it as a valuable means of addressing their knowledge gaps and enhancing their understanding of science topics. The theme of expansion of learning is that sharing knowledge serves as a way to gather additional information. They enhance the understanding and knowledge of science for the participants. This theme underscores the idea that sharing donates to a more comprehensive and more profound learning of the subject. Knowledge sharing opens the door of openness to learning; this theme suggests that the respondent's openness to new knowledge and learning experiences is vital to sharing and receiving knowledge with classmates. It reflects their receptivity to new ideas and willingness to exchange knowledge. A cheerful group collaboration, the theme of positive group collaboration indicates that the respondent's example of a group activity highlights the importance of collaborative tasks in their educational experience. It reflects that working with classmates on a task fosters a conducive knowledge-sharing and learning environment. The attributes of receiving knowledge in a junior high school science education and openness to new learning illustrate the positive aspects of group collaboration, indicating that the experience has generally been smooth and positive regarding knowledge sharing. Teachers' strong motivation in teaching science education carried out the student's expectations in sharing knowledge in structured observe learning outcome (Yuniarsih, Tjutju & Kusnendi, Kusnendi & Wibowo, Lili 2020).

Thematic Analysis on knowledge sharing highlights the openness to new learning and positive group collaboration; learners possess a positive attitude toward new learning experiences, are receptive to new ideas, and are willing to engage in new knowledge. The positive group collaboration themes highlight the importance of working with their classmates to foster a conducive environment. Ultimately, the respondents attribute their lack of struggles and receiving knowledge in junior high school science education to their openness to new learnings. Group activity illustrates the positive aspects of group collaboration, indicating that the experience has generally been smooth and positive regarding knowledge sharing by valuable teammates (Chun_yu et al. Huang, 2020).

3.3. Outcome Expectations

The learner's expected outcome is direction while the learning process is ongoing (Zorluoğlu et al., 2019). Learner respondents emphasize that their favorite subject and priority is science. These codes reflect the importance placed on science in their academic and career aspirations. To reach better outcomes, respondent suggests a strong sense of

control and focus on their academic achievements in science and future success. Control and focus have a strong sense on their academic performance in science courses. This code signifies their proactive approach to academic success. Learner's respondent, expectations driving performance. The outcome expectations significantly motivate them to perform well in science courses, focus on a positive attitude, and be motivated to continue learning about science in real life (Ward et al., 2020). Science role in life and significance in daily life indicate that the respondents recognize the importance of science in various everyday activities. The themes reflect an awareness of the practical applications of science.

Learning outcomes are interrelated to students' sharing behaviors and impact their academic performance (Aslam¹, Siddiqi Shahzas² & Bajwa² 2021). Respondents have a broad understanding of success; the respondent believes that a deep understanding of science is a pathway to personal success. This theme reflects their perception of the value of science education in achieving future academic career prospects. They emphasize the significance of science in everyday life and see the complete understanding of science as key to personal success. These expectations and beliefs influence their performance in science courses and outlook on future academic careers. Another learner respondent highlighted the expectation of gained knowledge; respondents mentioned that they expect more from science and that it could help them understand anything. This code signifies the expectation of gaining knowledge and understanding through science education. Motivation and engagement in gaining more knowledge from science indicate that outcome expectations motivate them to engage in science education. Outcome expectations driving suggests that the respondent's expectations in science are high for their academic performance serves as a solid motivating factor. The desire for continuous improvement signifies that the respondent is motivated by their current results and has a continuous desire for their performance and engagement in science education. It reflects their commitment to ongoing growth. Learner respondents highlight a positive impact on their studies; these themes imply that the respondents expect their outcome expectations to enhance their academic performance in science. It indicates that they view their prior knowledge as a valuable asset. A solid scientific foundation suggests that the respondent's existing knowledge is a basis for further learning and growth. Commitment and challenges have an essential role to play in overcoming challenges. It reflects the respondent's determination to conquer difficulties in the science subject.

This scenario underscores their dedication to address any obstacle that may arise. Outcome expectations have a positive impact on science education. The response indicates that they have faced challenges in their life where they did not know what to do, but their experiences in science education have enabled them to address and solve these problems. It suggests that their outcome expectations in junior high school science education are influenced by the belief that science education equips them with problem-solving skills and the ability to overcome challenges.

Furthermore, the learner respondent mentioned the teacher's influence on outcome expectations, and the theme of teacher influence on outcome suggests that the respondent's expectations and beliefs about their performance in junior high school science education have been significantly shaped by their science teachers. This theme reflects the pivotal role of educators in influencing the students' outlook on their academic success. Meanwhile, teaching style impacts learning and performance; this reflects teaching style impact indicates that science teachers' teaching methods and styles profoundly affect the respondent's learning and academic performance (Gulbin Ozkan¹, Unsal Umdu Topsakal², 2021). This theme highlights the crucial role of pedagogy in shaping the student's educational experience. Inspiration for learning signifies that teachers seek knowledge, both within and beyond existing understanding, the motivational and inspirational aspect of the teacher's impact on the student's approach to education.

Lastly, the learner respondent emphasizes the practical application of science knowledge, underscoring the respondent's ability to connect what they learn in the science subject to real-life situations. It reflects the belief that science has direct relevance to everyday life. As a part of learning science is understanding research methods, this theme indicates the respondent's awareness of research methodologies, such as the triangulation method. It suggests a deeper understanding of how science is applied and developed through research. Continuing the evolution of science education, the theme of the significance of science education highlights the importance of learning science in daily life and its role in research development. The respondent sees science education as vital for personal growth and contributing to broader societal advancement. Combining practical scientific skills in scientific methods and conceptual comprehension creates a blend of hands-on application and activity development (Oliveira et al.; J., 2023). It will contribute to increased motivation for learning science, and learners' interest will increase the likelihood of pursuing a scientific career, which can impact the lack of human resources.

3.4. Academic Performance

Students' performance indicates a lifelong learning process involving classroom engagement and clarity of explanation; teacher motivation and parents' involvement are crucial in gauging science education in junior high school (Gara¹, Dela Cruz², 2023). The learner respondent highlights the improved performance; the respondent mentions that they have improved in science learning areas since the beginning of junior high school. Respondents' responses indicate that they have experienced improved academic performance in junior high school science courses with a notable change in attitude towards the subject. They acknowledge that they initially faced challenges, including a lack of motivation, but attribute their improved performance to being allowed to learn and embrace the science subject.

However, the learner respondent stated that challenges in fundamental knowledge absorption signify that the respondent faces difficulties when dealing with a large volume of information. This theme highlights a specific challenge in their learning process. Other themes that the respondents highlight are motivation and striving harder, which indicates that they attribute their personal qualities like motivation and a strong work ethic. Teachers and learners should look for a conducive learning environment and teaching styles to deliver the lecture (Bugwak Elven, 2023). It reflects the respondent's proactive approach to overcoming challenges and improving performance. The respondent recognizes diverse interests and that every learner has different levels of interest in science and views exploring the world of science as an adventure. This theme emphasizes the individuality of student interest and learning experiences. Commitment to continuous improvement reflects the respondent's determination to keep striving and studying hard in all aspects of science. Educational experience represents knowledge, skills, and attitudes, which are vital in determining student academic achievement (Mappadang¹, Khusaini², Sinaga² & Elizabeth² 2022). This theme signifies their dedication to self-improvement and academic success.

Meanwhile, learner respondents stated that knowledge sharing and outcome expectations played a significant role in their academic performance in science at the junior high school level. The respondents suggest a negative attitude towards knowledge sharing and outcome expectations in the context of junior high school science education. They believe that sharing knowledge can lead to differences in ideas and even debates or conflicts, in which opinion is not an idea. Respondents valued the importance of knowledge sharing, which suggests the value of sharing knowledge and beliefs as an essential component of their academic performance. Academic achievements play a positive attitude and support from others' self-control, teachers, and learners, stimulating enthusiasm in sharing valuable knowledge (Ling et al., 2022). This theme reflects their understanding that no individual can possess all information, and sharing fills the gaps. This theme's inadequacy of individual knowledge reflects the idea that, in their opinion, no person can hold all information. This theme highlights the recognition that knowledge sharing is essential to cover the gaps in individual understanding. Furthermore, the benefit of group activities, the theme of the benefit of group activities, signifies that group settings, where knowledge and information are shared, have positively impacted the respondent's academic performance. This theme reflects the practical application of knowledge sharing within a collaborative learning context.

Lastly, enhanced understanding is critical to achieving academic success in junior high education. It is beneficial, particularly when facing difficulties in understanding lessons, as it can lead to a more specific and improved understanding of the subject matter. Achieving expected results signifies the combination of persistence, high expectations, motivation, and knowledge sharing, leading to achieving the desired outcomes. Taking personal responsibility, each individual is the primary driver of his success. Personal determination plays a central role in achieving success. While not explicitly mentioned, knowledge sharing and outcome expectations may enhance cooperation and determination, thereby contributing to academic success.

4. Discussion

The study findings deliver valuable insights into the attitudes and experiences of learners regarding science education. These four major themes, such as , a positive attitude toward learning science, knowledge sharing, outcome expectations, and academic performance, alleviate light on the multi-interplay of aspects influencing students' engagement and success in science education.

4.1. Positive Attitude Toward Learning Science

The research participants overwhelmingly express a positive attitude towards learning science. They find the subject enjoyable and challenging, embracing the diversity of scientific topics. Students have mixed experiences, including challenges and engaging aspects, indicating their dynamic educational journey. Language barriers, stress, and coping are highlighted as obstacles to their education, emphasizing the emotional aspects of their learning.

This theme underscores the importance of fostering a supportive and inclusive learning environment to address challenges and promote a positive attitude among students.

4.2. Knowledge Sharing

Learners actively share knowledge through cooperative activities and intrinsic motivation to share their acquired knowledge. Knowledge sharing is a means to address knowledge gaps, enhance understanding, and improve academic performance. The positive group collaboration suggests that working together fosters a conducive knowledge-sharing environment.

This theme underscores the value of collaboration and peer interaction in science education, contributing to students' overall learning experience and academic success.

4.3. Expectations and Outcome

Students have clear expectations and beliefs about the role of science in their academic and career aspirations. They emphasize the importance of control and focus in achieving their goals, with high expectations as motivators. Science practical significance in daily life is recognized, and a deep understanding of science is a pathway to personal success.

This theme highlights the significant influence of students' expectations on their motivation and performance in science education. It also underscores the role of teachers in shaping these expectations.

4.4. Academic Performance

Improved academic performance is a common outcome reported by learners, indicating a positive shift in their attitude toward science. Challenges, motivation, and striving harder are crucial in overcoming obstacles and enhancing performance. Recognizing diverse interests among students emphasizes the individualized nature of learning experiences. Knowledge sharing and outcome expectations were identified as factors that positively influence academic performance, with group activities contributing to the learning process.

This theme emphasizes the importance of personal determination, collaboration, and expectations in achieving academic success in science education.

In conclusion, these findings highlight the multifaceted nature of students' experiences in science education. A positive attitude, knowledge sharing, outcome expectations, and academic performance are interrelated and play a pivotal role in shaping the overall educational journey of learners. Educators and institutions can use this information to tailor their teaching methods and support mechanisms to create a more conducive and engaging science education environment. Addressing language barriers and stress can further enhance students' learning experiences and promote their success in science education.

5. Conclusion

This study come up with valuable insights into the experiences and attitudes of students in the context of science education—the four major themes explored. Namely, positive attitudes toward learning science, knowledge sharing, outcome expectations, and academic performance shed light on the complex interplay of factors influencing students' engagement and success in science education.

5.1. Positive Attitude Toward Learning Science

The research reveals that students generally possess a positive attitude toward learning science. They find the subject enjoyable and challenging, even though they encounter various challenges and engaging aspects. Language barriers and stress are identified as hurdles to their educational journey. These findings underscore the need for supportive and inclusive learning environments to address these challenges and foster a positive attitude among students.

5.2. Knowledge Sharing

Students actively engage in knowledge sharing through cooperative activities and intrinsic motivation. Knowledge sharing is seen as a means to address knowledge gaps, enhance understanding, and improve academic performance. The positive group collaboration highlights the importance of collaboration and peer interaction in science education, contributing to students' overall learning experiences and academic success.

5.3. Expectations and Outcome

Students hold clear expectations and beliefs regarding the role of science in their academic and career aspirations. They emphasize the importance of control, focus, and high expectations, which motivate their educational efforts. The practical significance of science in daily life is recognized, with a deep understanding of science considered a pathway to personal success. These findings underscore the influence of students' expectations on their motivation and performance, as well as the role of teachers in shaping these expectations.

5.4. Academic Performance

Improved academic performance is a common outcome reported by students, indicating a positive shift in their attitudes toward science. Overcoming challenges, motivation, and determination play a crucial role in enhancing their performance. Recognizing diverse interests among students underscores the individualized nature of their learning experiences. Knowledge sharing and outcome expectations are identified as factors positively affecting academic performance, with group activities contributing to the learning process.

Furthermore, these findings highlight the multifaceted nature of students' experiences in science education. A positive attitude, knowledge sharing, outcome expectations, and academic performance are interrelated and pivotal in shaping the overall educational journey of learners. Teachers and organizations can utilize this information to tailor teaching methods and support mechanisms, creating a more conducive and engaging science education environment. Addressing language barriers and stress challenges can further enhance students' learning experiences, ultimately promoting their success in science education.

Recommendations

Based on the results of the study, here are some recommendations that promote and support knowledge sharing among students, enhancing their understanding of science subjects and contributing to their academic success.

5.5. Encourage Collaborative Learning Environments

Foster an atmosphere that values and encourages knowledge sharing among students. Implement group discussions, peer teaching, or collaborative projects to facilitate the exchange of information and insights.

5.6. Promote Peer-Assisted Learning Strategies

Establish platforms or sessions where students can share their understanding and knowledge with peers struggling to comprehend specific lessons. This reciprocal teaching approach can aid both the sharer and the recipient clear comprehension the material.

5.7. Integrate Peer Tutoring Programs

Implement structured peer tutoring programs within the school curriculum, where students can formally assist each other in areas of difficulty. This approach can enhance understanding and academic success through shared knowledge and insights.

5.8. Teacher-Facilitated Knowledge-Sharing Activities

Design classroom activities or projects that require students to share their understanding of lessons with their peers. Teachers can actively encourage and guide these knowledge-sharing activities, emphasizing their importance in achieving academic success.

5.9. Promote a Culture of Resilience and Persistence

Encourage students to embrace the idea that ongoing effort and determination are integral to academic success. Implement programs or workshops highlighting the significance of persistence, resilience, and continuous learning as fundamental components of achievement in science education.

5.10. Set Clear Goals and Foster Motivation

Establish a framework that emphasizes setting clear, achievable goals and motivates students to strive for these objectives. Empower them to define their academic expectations and support them to maintain their motivation.

5.11. Encourage Collaborative Learning Environments

Create an atmosphere that fosters openness to knowledge sharing and collaboration among students. Develop group activities, peer learning sessions, or projects that promote knowledge exchange and mutual learning among peers.

5.12. Recognize and Celebrate Achievements

Implement a system that acknowledges and celebrates instances where students meet their academic expectations through persistence, motivation, and knowledge sharing. This recognition could be in the form of awards, certificates, or public acknowledgment to reinforce the importance of these qualities.

5.13. Investigate Strategies to Overcome Academic Challenges

Research to identify students' specific challenges in science education and explore effective strategies to address these obstacles. Understanding the nature of these challenges and developing targeted solutions can significantly enhance the learning experience.

5.14. Examine Motivational Drivers in Science Education

Study the factors contributing to students' intrinsic motivation and desire to learn in science. Understanding these motivational drivers can help design interventions that foster and sustain students' enthusiasm for learning.

5.15. Evaluate the Impact of Collaborative Learning

Investigate the impact of collaborative learning and knowledge-sharing initiatives on academic success in science education. Assess the effectiveness of various collaborative methods in enhancing understanding, knowledge acquisition, and overall academic performance.

5.16. Assess the Role of Persistence and Diligence

Research the correlation between persistence, consistent effort, and academic success in science education. Investigate how these qualities influence the achievement of outcome expectations and identify the best practices for fostering student persistence and diligence.

5.17. Explore Student Perspectives and Interventions

Conduct qualitative research to explore student perspectives on challenges, motivation, knowledge sharing, and persistence in science education. Use these insights to design tailored interventions that address specific student needs and foster a conducive learning environment.

These recommendations aim to cultivate an environment that values persistence, motivation, collaboration, and the pursuit of high academic expectations. Moreover, the objective is to delve into a deeper understanding of the challenges, motivational factors, collaborative learning, and persistence in science education, ultimately contributing to developing effective strategies and interventions to enhance academic success in junior high school science education.

Compliance with ethical standards

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Disclosure of conflict of interest

Marinel Ramilo Gara, the author of this manuscript, currently affirms that there are no conflicts of interest associated with the content of this research. We confirm that this study has been conducted unbiasedly, free from any financial or personal associations that could influence the interpretation of results or the portrayal of findings. In the event of any future conflicts of interest, we commit to promptly disclosing them.

Statement of informed consent

Learner's participants were notified that participation was voluntary and could withdraw without repercussions on their relationship with the researchers or institution.

Confidentiality measures were explained, assuring participants that their data would be anonymized, stored securely, and used solely for this study. I addressed participant queries comprehensively, ensuring their understanding and allowing them ample time to decide. Documented permission was acquired from each participant before any study-related processes were initiated.

I recognize my responsibility in adhering to ethical guidelines, ensuring proper documentation of informed consent, and abiding by research regulations involving human subjects."

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Author's Short Biography



Marinel Ramilo Gara, a Junior High School Science teacher at General Emilio Aguinaldo National High School, embodies a passion for education that fuels her unwavering dedication. Her journey commenced at Pamantasan ng Lungsod ng Muntinlupa, where she earned her Bachelor of Secondary Education Major in Physical Sciences and a Master of Arts in Education Major in Educational Management at the same institution.

Driven by a relentless pursuit of excellence, Marinel is pursuing her Doctor of Education in Educational Leadership at the National Teachers College - Manila Campus in the Philippines. Her commitment to shaping young minds and fostering a love for learning marks her teaching philosophy.

Marinel's academic odyssey reflects resilience and a profound dedication to advancing educational methodologies. Her relentless pursuit of knowledge and efforts toward enhancing educational systems stand as a testament to her unwavering commitment to the transformative power of education.