Pedagogical Approaches of Junior High School Science Teachers in Teaching Science

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ABSTRACT

The primary objective of this study is to describe the various pedagogical approaches utilized by Junior High School science teachers in teaching science to students. According to the findings of this research, most science teachers employ a collaborative teaching method, which is then followed by experimentation and differentiated instruction in their classrooms. This agrees with an article that was posted on the internet by Cox (2019), saying that the most effective methods for teaching science include collaborative learning and differentiated instruction.

The data also showed that science teachers were familiar with the twenty-nine (29) approaches in the questionnaire but barely utilized these different strategies in their lessons. It can be seen also the notable difference between the levels of implementation of highly proficient teachers and proficient teachers, which indicates that highly proficient teachers employ a greater variety of pedagogical strategies in their classroom instruction.

The fact that there were only fourteen teachers of science who participated in the survey, which is the primary limitation of this study; yet the findings do demand a considerable amount of attention. The findings, in general, showed that the problems do not simply highlight the teacher factors but also a lack of facilities that demand immediate attention. Coordination is required with the school head and schools' division office Science Education Program Supervisor to address the identified issues to maintain the delivery of quality science education.

Keywords: Science Instruction, Teaching Methods, Cooperative Learning, Differentiated Instruction, Teacher Effectiveness

INTRODUCTION

Science is the systematic and evidence-based pursuit and application of knowledge and comprehension concerning the natural and social worlds. With the help of science, man has been able to accomplish incredible things, including the invention of modern machinery such as automobiles, airplanes, and spacecraft; the building of megastructures; the development of modern medicines; and the development of high-tech devices.

The study of science is just as important as the study of other disciplines, such as the arts and the history of our time. The ever-increasing priority placed on the study of STEM subjects in schools is currently at the forefront of debates concerning education in the present day. The amount of content that needs to be covered, combined with the fact that students become disinterested because of the level of proficiency required in the sciences, makes it a challenging subject to teach. However, the need to instill a scientific mindset in one's students should be at the forefront of every educator's mind. There is a great deal more to it than simply repeating equations, ideas, and vocabulary words (Singh, 2021).

The need for professionals in STEM subjects, which include the sciences, innovation, engineering, and mathematics, is increasing at the same rate as technology. A lack of competent and educated individuals with these talents has led to an increase in demand in a variety of industries around the globe. Obtaining a degree in a scientific, technology, engineering, or mathematics subject is tough and time-consuming, which is a major cause of the labor shortage. STEM majors must spend an additional one-third to one-half of their time on

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studying, reading, and writing projects compared to non-STEM majors. In addition, students need instruction in the correct use of laboratory research notebooks, cleanroom notebooks, engineering notebooks, and scientific notebooks (Bengallup, 2015).

Science educators play a crucial role in achieving the curricular objectives for science, which are necessary if the country is to create sufficient STEM professionals to meet demand. Teachers with the ability to maintain students' attention, familiarity with students' preferred learning styles, willingness to adapt lessons to accommodate students' unique needs, commitment to professional development, and flexibility in adapting science lessons to the results of formative assessments can accomplish this (Essential Qualities of a Great Science Teacher | UTA Online, 2015). In addition to this, those who teach students about science should be well-versed in the most recent developments in educational methodology in order to do their jobs effectively.

When training students on the scientific process, teachers may utilize a variety of approaches. There are two primary approaches to approach the topic of scientific education: from the teachers or the students viewpoint. Both of these educational methodologies have a role in the classroom, but they work very differently (Fizzics Education, 2019). In the 2017 study by Oyelekan et al., even though all the teachers used all 36 of the identified strategies, the majority of scientific educators employed just two (2) of them on a regular basis. The remainder was employed seldom in the classroom. This suggests that science teachers hardly ever use these highly effective instructional techniques in their classes. The item-by-item study revealed considerable variations between experienced and less experienced science teachers, regarding a few particular highly effective teaching techniques.

According to Khurshid and Zahur (2013), educators with more degrees of professional training have a greater understanding of creative teaching approaches than educators with lesser levels of professional training. The demand for subject area and pedagogy certification has increased steadily in response to the need for highly trained teachers yet associating teacher quality with credentials has not produced the desired effects. Both in terms of what their students learn and how they learn it, teachers have a substantial impact on their students. Since a consequence, it is essential that they continually exhibit great behavior, as their students are prone to imitate their acts and attitudes.

Recent initiatives in the Philippines have focused on improving scientific education in secondary schools and educating science teachers. According to research done, the quality of the science educators in schools has a significant impact on the quality of the science teaching that students receive. There is a strong correlation between the quality of instruction that students receive from their science teachers and the level of interest that they demonstrate in the scientific field. While conducting interviews with students who excelled in science, it was discovered that these students were tremendously motivated by science teachers who engaged their classes in activities that allowed the students to investigate and find solutions to difficulties (SEI-DOST & UP NISMED, 2011).

In the Philippines, there is no way that the way science is taught and practiced can be called a strength. The 2014 NAT results indicate that just 69.21% of sixth graders were successful. According to figures from 2010, the passing percentage for high school students was only 46.38 percent, making it one of the lowest in the country. In addition, the Philippines has a history of performing horribly in international rankings and polls (Ambag, 2018).

The 2019 Trends in International Mathematics and Science Study found that fourth grade Filipino students fared "much worse" than students from every other country assessed. The Philippines scored 297 out of a possible 300 in mathematics and 249 out of 300 in science, making them the "worst" performer of all the countries that took part. Among the 58 nations that took the test both times, the Philippines had the worst overall performance (PH Lowest Among 58 Countries in Math and Science—Global Assessment, 2020). A separate set of data given on the Organization for Economic Co-operation and Development (OECD) website showed that 15-year-olds in the Philippines scored 357 points on average in science, which is lower than the average performance in science in OECD countries, which was 489 points.

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In a public secondary school in the Bicol Region, Philippines, even before the pandemic has an impact on the educational system, it has been observed that science has the highest percentage of failing students in the academic year 2021–2022. Concerns have been raised since the country's performance in science on both the national and international stage has been on the decline, and one of the factors that is causing this is the use of an inappropriate and ineffective teaching approach. Now that face-to-face classes are back, it is a fantastic opportunity to study the various methods of instruction utilized by the science teachers this school year, 2022-2023. Consequently, the purpose of this study is to determine the extent to which science teachers employ various pedagogical approaches when instructing students on scientific concepts, with the ultimate goal of developing capacity building to improve the pedagogical approaches used by junior high science teachers at and, as a result, improve students' performance in science classes.

This study is guided by constructivist and inquiry-based learning theories, which emphasize that students learn best when actively engaged in constructing knowledge through exploration, collaboration, and reflection. Constructivism, rooted in the work of Piaget (1972) and Vygotsky (1978), highlights the importance of learner-centered approaches where teachers act as facilitators rather than transmitters of information. Inquiry-based learning, advanced by Dewey (1938) and Bruner (1961), complements this by encouraging students to investigate scientific problems, ask questions, and develop solutions, thereby fostering critical thinking and scientific literacy.

These theories provide coherence to the analysis of pedagogical approaches observed in this study. The predominance of collaborative learning, experimentation, and differentiated instruction among teachers reflects constructivist principles of social interaction and scaffolding. Meanwhile, the underutilization of resource-intensive strategies such as remote labs and science museums underscores the challenges of fully realizing inquiry-based learning in contexts with limited resources. By framing the findings within these theories, the study situates teacher practices not only as individual choices but as reflections of broader pedagogical paradigms that align with the Philippine Professional Standards for Teachers (PPST) and national STEM priorities.

Problem Statement

This study aims to describe the pedagogical approaches employed by junior high school science teachers in teaching science in a public national high school in the Bicol Region, Philippines.

1. What is the profile of science teachers in terms of their;

a. years in service and

b. teaching position?

2. What are the pedagogical approaches used by junior high school science teachers in teaching science?

3. What is the level of utilization of pedagogical approaches among junior high school science teachers in teaching science?

4. What is the mean difference in the level of utilization of pedagogical approaches by proficient teachers and highly proficient teachers?

5. What capacity building activities can be designed to enhance the pedagogical approaches of junior high school science teachers in science teaching in a public national high school?

METHODOLOGY

Research Design

A descriptive survey design was employed, complemented by a mixed-methods approach (quantitative and qualitative). This design was appropriate for profiling junior high school science teachers, examining their

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utilization of pedagogical approaches, and comparing differences between proficient and highly proficient teachers. The study also aimed to propose capacity-building activities aligned with the Philippine Professional Standards for Teachers (PPST).

Participants

The study involved 14 junior high school science teachers from a public national high school in the Bicol Region, Philippines. All participants had at least three years of teaching experience. Distribution by grade level was: Grade 7 (3), Grade 8 (4), Grade 9 (4), and Grade 10 (3). Most teachers had 4–10 years of service, with positions ranging from Teacher I to Master Teacher I, consistent with PPST career stage classifications.

Table 1 Distribution of Respondents

Grade Level	No. of Teachers
Grade 7	3
Grade 8	4
Grade 9	4
Grade 10	3
TOTAL	**14**

Instruments

Data were gathered using a researcher-developed questionnaire adapted from Oyelekan et al. (2017) and aligned with Edsys' pedagogical framework (2018).

- Section 1: Teacher profile (years of service, position).
- Section 2: Utilization of 29 pedagogical approaches.

Responses were rated on a three-point scale: Heavy Use (3), Moderate Use (2), and No Use (1). Mean values were interpreted as:

- 1.0–1.7 = Never/Seldom Used
- 1.7–2.4 = Occasionally Used
- 2.5–3.0 = Frequently Used

Data Collection

Permission was secured from the school principal. Teachers completed the questionnaire, which included both closed-ended and open-ended items to capture frequency of use and rationales for pedagogical choices. Responses were treated with confidentiality and respect for research ethics.

Data Analysis

Data were analyzed using frequency counts, percentages, and means to determine levels of utilization. Differences between proficient and highly proficient teachers were examined through mean comparisons across categories (frequently used, rarely used, not used). This analysis provided insight into how career stage influences pedagogical diversity.

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Limitations

The study is limited by its small sample size (14 teachers) from a single school, which restricts generalizability. While findings highlight important trends, they should be interpreted as indicative rather than representative. Broader studies across multiple schools are recommended to validate and extend these results.

RESULTS

The following is a presentation and explanation of the data that were obtained in regard to each of the research questions:

Table 2 Philippine Professional Standards for Teachers

Career Stage	Description
Career Stage 1 - Beginning Teachers	• Have gained the qualifications recognized for entry into the teaching profession. • Have a strong understanding of the subjects/areas in which they are trained in terms of content knowledge and pedagogy. • Possess the requisite knowledge, skills, and values that support the teaching and learning process. • Manage learning programs and have strategies that promote learning based on the learning needs of their students. • Seek advice from experienced colleagues to consolidate their teaching practice.
Career Stage 2 - Proficient Teachers	• Are professionally independent in the application of skills vital to the teaching and learning process. • Provide focused teaching programs that meet curriculum and assessment requirements. • Display skills in planning, implementing, and managing learning programs. • Actively engage in collaborative learning with the professional community and other stakeholders for mutual growth and advancement. • Are reflective practitioners who continually consolidate the knowledge, skills, and practices of Career Stage 1 teachers.
Career Stage 3 - Highly Proficient Teachers	• Consistently display a high level of performance in their teaching practice. • Manifest an in-depth and sophisticated understanding of the teaching and learning process. • Have high education-focused situation cognition, are more adept in problem solving, and optimize opportunities gained from experience. • Provide support and mentoring to colleagues in their professional development and work collaboratively with them to enhance learning and practice potential. • Continually seek to develop their professional knowledge and practice by reflecting on their own needs and those of their colleagues and students.
Career Stage 4 -	• Embody the highest standards for teaching grounded in global best practices.

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Distinguished Teachers	• Exhibit exceptional capacity to improve their own teaching practice and that of others. • Are recognized as leaders in education, contributors to the profession, and initiators of collaborations and partnerships. • Create lifelong impact in the lives of colleagues, students, and others. • Consistently seek professional advancement and relevance in pursuit of teaching quality and excellence. • Exhibit commitment to inspire the education community and stakeholders for the improvement of education provision in the Philippines.

Research Question 1: *What is the profile of science teachers in terms of their years in service and teaching position?*

Table 3 Profile of Science Teachers

Years in Service	**Frequency**	**Teaching Position**	**Frequency**
4–10 years	10	Teacher I	8
More than 10 years	4	Teacher III	4
-	-	Master Teacher I	2
Total	**14**	**Total**	**14**

Table 3 shows the majority of respondents (71%) had 4–10 years of teaching experience, while 29% had more than 10 years. In terms of position, 57% were Teacher I, 29% Teacher III, and 14% Master Teacher I. This profile suggests that most participants are mid-career teachers, with a smaller group of senior educators who may have broader pedagogical expertise. The distribution reflects a workforce still progressing through the PPST career stages, with implications for professional development and pedagogical diversity.

Research Question 2: *What are the pedagogical approaches used by Junior High School science teachers in teaching science?*

Table 4 Pedagogical Approaches used by Junior High School Science Teachers

Pedagogical Approaches	**Frequency**
Collaborative Learning	12
Experimentation	10
Differentiated instruction	9
Project-based	8
Inquiry Based	8
Constructivist approach	4
Gamification	2
Integrative learning	2

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Reflective	2
Small Group	2

Table 4 shows collaborative learning was the most common approach, reported by 86% of teachers, followed by experimentation (71%) and differentiated instruction (64%). Moderate use was observed for project-based and inquiry-based learning (57% each). Less frequently employed were constructivist methods (29%) and innovative strategies such as gamification, integrative learning, reflective practice, and small group instruction (14% each). These results indicate a strong preference for hands-on, cooperative methods, while more creative or resource-intensive approaches remain underutilized.

Research Question 3: *What is the level of utilization of pedagogical approaches of Junior High School science teachers in teaching science?*

Table 5 shows that out of the 29 pedagogical strategies assessed, 41% were frequently used, 52% were rarely used, and 7% were not used at all. Teachers relied most on classroom-based, low-cost approaches such as multimedia, video clips, and guided discovery, while resource-intensive methods like remote labs and science museums were not implemented due to accessibility and funding constraints.

Table 5 Level Of Utilization of Pedagogical Approaches

Utilization Level	**No. of Pedagogies**	**Percentage**
Frequently Used	12	41%
Rarely Used	15	52%
Not Used	2	7%

Research Question 4: *What is the mean difference in the level of utilization of pedagogical approaches by proficient teachers and highly proficient teachers?*

Table 6 Mean Utilization of Pedagogical Approaches by Teacher Proficiency

Pedagogical Approaches	**Frequently Used Mean**	**Rarely Used Mean**	**Not Used Mean**
Proficient Teachers	13.92	9.5	4.75
Highly Proficient Teachers	17	9	2.5

Table 6 shows highly proficient teachers reported 17 strategies frequently used compared to 13.92 for proficient teachers, showing broader pedagogical diversity. An independent samples t-test was conducted to explore this difference. Results suggested that highly proficient teachers reported more frequent use of pedagogical approaches; however, given the very small sample size (n = 2), the test results are not statistically robust and should be interpreted with caution. These findings are better viewed as indicative trends that warrant confirmation in larger samples.

Reasons for Pedagogical Utilization

Table 7 Summary of Reasons for Frequently, Rarely, and Not Used Pedagogies

Utilization Level	**Key Reasons Reported**	**Frequency Range**
Frequently Used	Easy to use; caters to students' skills; available/integrated in science teaching; manageable for teachers; suits learning needs; familiar/effective	1–8

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Rarely Used	Requires more preparation time/cost; lack of familiarity or confidence; not available; limited applicability; lack of materials; difficult to supervise	1–7
Not Used	Not accessible/available; not familiar; not suited to students' learning; difficult to implement; lack of funding; absence of required technologies	1–7

Table 7 shows teachers favored strategies that were easy to implement, manageable, and resource-friendly, noting that these approaches catered to diverse student skills and were familiar in practice. Conversely, strategies requiring greater preparation time, specialized materials, or higher costs were rarely used, while those dependent on external resources (e.g., science museums, remote labs) were not used at all. Confidence also played a role: teachers avoided unfamiliar methods even when potentially effective. These findings emphasize that practicality, familiarity, and resource availability are decisive factors in pedagogical adoption.

DISCUSSION

The findings revealed that collaborative learning, experimentation, and differentiated instruction were the most widely used strategies. This supports Cox (2019), who emphasized that collaborative learning and differentiated instruction are among the most effective methods for teaching science. Teachers appear to favor approaches that actively engage students and foster teamwork, consistent with the Philippine Professional Standards for Teachers (PPST) emphasis on learner centered pedagogy. However, innovative strategies such as gamification and integrative learning were rarely applied, echoing Oyelekan et al. (2017), who found that science teachers often limit themselves to a small subset of strategies despite being familiar with many.

Although teachers were familiar with a wide range of strategies, more than half were rarely used and a few were not used at all. Resource-intensive approaches, such as remote labs and science museums, were constrained by accessibility and funding limitations. This reflects systemic challenges in Philippine public schools, where infrastructure and materials often lag behind curricular expectations (Ambag, 2018). The reliance on classroom-based, low-cost methods underscores the importance of addressing resource gaps to enable broader pedagogical diversity. These findings are particularly significant in light of national STEM priorities, which call for stronger integration of inquiry-based and technology-enabled learning to prepare students for future scientific and technological challenges.

The comparison between proficient and highly proficient teachers showed that higher proficiency correlated with greater pedagogical diversity. Highly proficient teachers reported more frequent use of varied strategies and fewer instances of non-utilization. This finding is consistent with Khurshid and Zahur (2013), who argued that teachers with more professional training demonstrate greater understanding of creative approaches. It highlights the value of continuous training and mentoring to help proficient teachers expand their instructional practices. This progression reflects the PPST career stage framework, where teachers are expected to demonstrate increasing adaptability and innovation as they advance professionally.

Teachers consistently cited ease of use, manageability, and availability of resources as reasons for frequently used pedagogies. Conversely, strategies requiring additional preparation time, financial resources, or specialized materials were rarely or not used. This reflects the broader observation by Singh (2021) that science teaching becomes challenging when students disengage and teachers lack practical tools to adapt lessons. Without adequate support, even effective methods may remain underutilized.

The underutilization of diverse pedagogical approaches must also be considered against the backdrop of the Philippines' performance in international assessments. The 2019 TIMSS and OECD PISA (2020) results showed Filipino students scoring significantly below global averages in science, highlighting systemic weaknesses in instructional practices. Compared to international benchmarks, where inquiry-based and technology-supported learning are more widely integrated, Philippine classrooms remain constrained by resource limitations and

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teacher confidence. This gap underscores the urgency of aligning classroom practices with global standards to improve competitiveness in STEM education.

The study underscores the need for capacity-building initiatives that address both teacher confidence and resource availability. Training programs should focus on equipping teachers with skills to implement less familiar strategies, while schools and divisions must provide access to materials and technologies. This aligns with SEI-DOST & UP NISMED (2011), which found that students excelled when teachers engaged them in investigative activities. Barriers such as lack of materials, preparation time, and confidence can be mitigated through:

- Resource provision (laboratories, ICT tools, external science resources).
- Professional development (training on innovative pedagogies).
- Collaborative mentoring (peer-to-peer support to reduce preparation burdens).
- Policy integration (embedding STEM priorities into school improvement plans).

By bridging these gaps, science teachers can diversify their approaches, thereby improving student engagement and performance in science and contributing to national STEM goals.

CONCLUSION

The study is limited by its small sample size (14 teachers from a single school), which restricts generalizability. Nevertheless, the findings provide valuable insights into current pedagogical practices and highlight areas for improvement. Future research should involve larger and more diverse samples across multiple schools to validate these trends and inform policy and training programs.

This study examined the pedagogical approaches of junior high school science teachers in a public national high school in the Bicol Region, Philippines. Findings revealed a strong reliance on collaborative learning, experimentation, and differentiated instruction, consistent with constructivist and inquiry-based learning theories (Piaget, 1972; Vygotsky, 1978; Dewey, 1938; Cox, 2019). While teachers were familiar with a wide range of strategies, more than half were rarely used and resource-intensive methods were not implemented, reflecting systemic challenges in Philippine science education (Ambag, 2018; Singh, 2021). Differences in career stage further highlighted that highly proficient teachers employed greater pedagogical diversity than proficient teachers, echoing Khurshid and Zahur's (2013) emphasis on the role of professional training.

These results underscore the need for capacity-building initiatives that strengthen teacher confidence, expand access to resources, and promote innovative pedagogies aligned with the Philippine Professional Standards for Teachers (PPST) and national STEM priorities. Practical recommendations include resource provision, targeted professional development, and collaborative mentoring to overcome barriers of preparation time, materials, and unfamiliarity. Future research should extend this study to larger samples, multiple schools, and longitudinal designs to examine the impact of diverse pedagogical approaches on student performance outcomes. By addressing these gaps, science education in the Philippines can move closer to international benchmarks (OECD, 2020; SEI-DOST & UP NISMED, 2011) and better prepare students for the demands of STEM fields.

RECOMMENDATIONS

Based on the findings of this study, several recommendations are proposed to strengthen science teaching in junior high schools:

1. **Expand Teacher Training on Diverse Pedagogies**

- Provide professional development programs that equip teachers with skills to implement less familiar strategies such as gamification, integrative learning, and reflective practice.

- This aligns with Khurshid and Zahur (2013), who emphasized that teachers with higher levels of training demonstrate greater creativity and adaptability.

2. **Enhance Resource Availability and Accessibility**

- Address systemic barriers by investing in laboratory facilities, remote labs, and access to science museums, which were identified as underutilized due to resource constraints.

- As Ambag (2018) noted, inadequate facilities contribute to declining science performance in Philippine schools.

3. **Promote Capacity Building Initiatives at the School and Division Level**

- Collaborate with school heads and Science Education Program Supervisors to design workshops and mentoring programs that encourage pedagogical diversity.

- SEI-DOST & UP NISMED (2011) highlighted that students excel when teachers engage them in investigative and problem solving activities, underscoring the importance of capacity building.

4. **Encourage Practical, Student-Centered Approaches**

- Reinforce the use of collaborative learning, experimentation, and differentiated instruction, which were most effective and frequently used by teachers in this study (Cox, 2019).

- At the same time, gradually integrate innovative strategies to balance practicality with creativity.

5. **Conduct Broader Research for Policy Development**

- Future studies should involve larger and more diverse samples across multiple schools to validate these findings and inform evidence-based policy.

- This is particularly important given the Philippines' consistently low performance in international assessments such as TIMSS and OECD PISA (PH Lowest Among 58 Countries in Math and Science—Global Assessment, 2020; OECD, 2020).

REFERENCES

1. (2017, September 25). What is Education for All? - LCC Deped. LCC Deped. Retrieved September 12, 2022, from https://lcc.deped.gov.ph/students/what-is-education-for-all-2/
2. Achor, E. E., Samba, R. M., & Ogbeba, J. A. (2010). Teachers' awareness and utilization of innovative teaching strategies in secondary school science in Benue State, Nigeria. Educational Research 1(2), 32-38.
3. Admin, E. S. (2018, January 5). 50 Innovative Teaching Methods in Science | Edsys. Edsys. Retrieved October 3, 2022, from https://www.edsys.in/innovative-science-teaching-methods/
4. Amin Mahmoud Raba, A. A. (2017, January 31). THE IMPACT OF EFFECTIVE TEACHING STRATEGIES ON PRODUCING FAST AND GOOD LEARNING OUTCOMES. Zenodo. Retrieved December 6, 2022, from https://zenodo.org/record/259563
5. Bengallup. (2015, April 24). Demand for Engineers and Scientists Continues to Increase. Scientific Notebook Company. Retrieved October 10, 2022, from https://snco.com/demand-engineers-scientists-continues-increase/
6. Bruner, J. S. (1961). The act of discovery. Harvard Educational Review, 31(1), 21–32.
7. Cox, J. (2019, October 4). Top 5 Teaching Strategies. TeachHUB. https://www.teachhub.com/teaching-strategies/2019/10/top-5-teaching-strategies/
8. Dewey, J. (1938). Experience and education. New York, NY: Macmillan.

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9. Doganay, & Ozturk. (2011). An Investigation of Experienced and Inexperienced Primary School Teachers' Teaching Process in Science and Technology Classes in Terms of Metacognitive Strategies. Educational Sciences: Theory and Practice, 11(3), 1320–1325.
10. Education | UNICEF East Asia and Pacific. (n.d.). Education | UNICEF East Asia and Pacific. Retrieved September 12, 2022, from https://www.unicef.org/eap/what-we-do/education
11. Education GPS - Philippines - Student performance (PISA 2018). (n.d.). Education GPS - Philippines - Student Performance (PISA 2018). Retrieved October 4, 2022, from https://gpseducation.oecd.org/CountryProfile?primaryCountry=PHL&treshold=5&topic=PI#:~:text=In%20Philippines%2C%20the%20average%20performance,2%20points%20higher%20for%20girls).
12. Essential Qualities of a Great Science Teacher | UTA Online. (2015, August 28). UTA Online. Retrieved October 10, 2022, from https://academicpartnerships.uta.edu/articles/education/great-science-teacher-qualities.aspx
13. Gajić, M. M., Miljanović, T. B., Babić-Kekez, S. S., Županec, V. D., & Jovanović, T. T. (n.d.). CORRELATIONS BETWEEN TEACHING STRATEGIES IN BIOLOGY, LEARNING STYLES, AND STUDENT SCHOOL ACHIEVEMENT: IMPLICATIONS FOR INQUIRY BASED TEACHING | Journal of Baltic Science Education. CORRELATIONS BETWEEN TEACHING STRATEGIES IN BIOLOGY, LEARNING STYLES, AND STUDENT SCHOOL ACHIEVEMENT: IMPLICATIONS FOR INQUIRY BASED TEACHING | Journal of Baltic Science Education. Retrieved December 6, 2022, from https://doi.org/10.33225/jbse/21.20.184
14. Khurshid, & Zahur. (2013). Comparison of teachers' awareness and utilization of innovative teaching strategies in private and public sector secondary schools. Elixer. https://www.elixirpublishers.com
15. Methods for teaching science: Fizzics Education. (2019, September 10). Fizzics Education. Retrieved October 1, 2022, from https://www.fizzicseducation.com.au/articles/methods-for-teaching-science/
16. PH lowest among 58 countries in math, science – global assessment. (2020, December 9). RAPPLER. Retrieved October 4, 2022, from https://www.rappler.com/nation/filipino-students-lagging-behind-math-science-timms-international-results-2019/
17. Piaget, J., & Inhelder, B. (1972). The psychology of the child. New York, NY: Basic Books.
18. SEI-DOST & UP NISMED, (2011). Science Framework for Philippine Basic Education. Manila: SEI-DOST & UP NISMED.
19. Singh. (2021, November 3). Importance of Science Education in Schools. The Asian School. Retrieved October 10, 2022, from https://www.theasianschool.net/blog/importance-of-science-education-in-schools/
20. Teaching science in the Philippines: Why (and how) we can do better - FlipScience - Top Philippine science news and features for the inquisitive Filipino. (2018, August 3). FlipScience - Top Philippine Science News and Features for the Inquisitive Filipino. Retrieved September 30, 2022, from https://www.flipscience.ph/news/features-news/features/teaching-science-philippines/
21. The right to education. (n.d.). Norad. Retrieved September 20, 2022, from https://www.norad.no/en/front/thematic-areas/education/right-to-education/#:~:text=Education%20Monitoring%20Report.-,The%20right%20to%20education%20is%20a%20fundamental%20human%20right.,to%20a%20free%20elementary%20education.
22. Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Cambridge, MA: Harvard University Press.