SCIENCE LITERACY: CALL FOR ACTION

by:
NANCY P. MACARAIG
Master Teacher II, Luakan National High School
Dinalupihan, Bataan

"An average high school student knows more about science than a scholar in the 18th century." A popular phrase occasionally encountered across the internet is a saying born in praise of scientific and educational advancements over the ages, a boastful statement comparing the knowledge of an average highschooler to that of a scholar, someone who is recognized to have more expertise in an academic discipline, albeit of the 18th century which is the exact reason for them being viewed as less than. But how much of this do we know is true?

The demand for science literacy has only increased over the ages. During the 1800s science rose in popularity among the higher classes, earning its place as a major subject in basic education alongside reading and arithmetic. However, studying science was often only accessible to the rich, and a larger demographic of the population, the poor, lagged in the scientific progress of those in higher classes as most of those in poverty remained illiterate, with the most that some of them could do was write their names. This is a common event seen not only in the West, as it remains a highly relevant issue in our society today, especially in third-world countries like the Philippines, where science literacy remains at concerningly low levels.

What does it mean to be literate in science? Science literacy can be defined as proficiency in absorbing, understanding, and putting into practice scientific knowledge like concepts and theories. Being able to grasp and apply scientific knowledge helps improve one's life and overall well-being and contributes to the overall community improvement. Possessing science literacy when utilized efficiently gives back to the

community, using scientific knowledge in solving real-world problems. One of the best examples of using science literacy to improve society is through medicine and research. In which the medics and researchers conduct studies and experiments on relevant issues intending to understand them deeply or to offer varying solutions that best suit the problem or phenomena they're facing.

Science literacy improves society and personal well-being. We can learn so much about ourselves and others through science. At the same time, it deepens our connection with nature. Science is a gateway that allows us to explore our world and beyond, opening our eyes to the wonders of the environment, and learning about our limits as dwellers of this Earth. Science allows us to see the adverse effects of human pollution and understand the severity of climate change. These are only a few things that science can offer those who are willing to become well-acquainted with it. However, none of this is possible when science literacy is low or in decline, particularly in students or youth as they are the ones that shall carry the responsibility of the future. Naturally, Countries with low science literacy struggle to enhance the quality for their citizens and to make meaningful contributions to society on a global scale.

According to the results from the 2022 Program for International Student Assessment (PISA), the Philippines' average score in science went from 356 to 355, a decline of one point since the 2018 PISA assessment. Science was the only subject among the three subject tested that experienced a drop in scores. This signifies a decrease in science literacy, and an active one at that, even if it's just one point – it shows a lot. Furthermore, the Philippines was one of the lowest-scoring countries according to the assessment, being ranked sixth lowest performing country in the assessment among the 81 countries that participated.

The Philippines has always been behind when it comes to science performance. Based on a study by Bernardo Et al. (2023), several intertwining factors affect and serve as predictors of student performance such as student and school characteristics, and

socioeconomic status. The study observed that these factors do have varying degrees of effect on student performance based on whether the student is a high or low performer. This brings us to the fact that socioeconomic status will automatically and inevitably enter the equation, with the Philippines being a lower-middle-income country according to the World Bank, the country's inadequacy in meeting certain global standards will unavoidably negatively impact the performance of students.

Science literacy demands more as it becomes increasingly incorporated into our lives as time goes by. The 21st century requires science literacy now more than ever as technology becomes more and more involved in the average person's life. Failure to meet the ever-increasing global standards when it comes to science literacy means failure to keep up with the constantly developing modern society and this is bad news not only for the individuals who lack sufficient literacy in science but also for the nation in which they belong. As it happens, science has become an integral part of nation-building, especially for developing countries that should utilize it more than ever to lead a flourishing nation. This is why the 2022 PISA Results are not just mere scores that should be given momentary concern – it's a distress call for the growing depravity in science literacy among the students of the Philippines.

The PISA Results also aren't just the baseline for this trend of decline in science literacy. Despite the reiterative efforts of the Department of Education (DepEd), there is yet to be any significant change that would mark a remarkable turnaround in the low performance of Filipino students in the science subject. The MATATAG Curriculum, which focuses on fundamental skills such as reading and writing as well as arithmetic, has yet to show any positive impact in improving the science literacy of students in the Philippines.

Meanwhile, the focus on improving science literacy among students and youth, though equally important, does not have to be limited in that sector. All Filipinos deserve the right to accessible means of gaining deeper knowledge in science, and the opportunity

to share and apply these learnings into everyday life. The literacy level of the Philippines as a nation when it comes to science is not just illustrative in the country's student scores in an international assessment, but also in how the common folk incorporate and understand science. Though it seems that the nation has emphasized the field of STEM in all sectors, especially in academia, underwhelming results from these efforts keep showing up. This begs the question, is representation the problem, or accessibility?

Going back to the opening line of an average high school student knowing more than an 18th-century scholar, it can be determined that there is some truth in that ubiquitous statement. Something from the 18th century remains long-standing until now when it comes to the study of science, and that something is accessibility or class disparity. It is only natural that an average high school of today can teach more to its students than an established academic institution 300 years ago thanks to the combined efforts of all the brilliant minds that contributed to the production of the kind of education that we have today. But mentors, books, paper, and ink were expensive then, and scholars usually required a patron to advance and fully focus on their studies. The same goes for today. Education is a human right and is free to the public, however, many other things in life aren't.

Students in poverty take on part-time jobs and drop out to earn money for their families and help support their parents financially instead of attending school. This phenomenon is often seen in third-world countries and is unfortunately the reality for many students in the Philippines. This is not to say that the blame for the decline in science literacy should be put on these students in poverty, rather, it aims to address that poverty will always be a hindrance in achieving learnedness in science for students of the nation.

The Philippines already falls short when it comes to providing lab materials to public schools, much less when it comes to school buildings, and there are often delays when it comes to the distribution of textbooks and teaching materials for teachers.

Moreover, when it comes to teachers, there is a high demand when it comes to science and mathematics educators, who usually have their work piled up for them as there may only be one of them for some provincial public schools. Even though a memorandum has been implemented that administrative work shall be reduced and even removed from a teacher's task list, it still stands that a lot of public school teachers have work responsibilities that reduce their focus on classroom work, which may lower the quality of science teachers teaching their subject. Again, this is not their fault, but the continuous flood of unfavorable circumstances leads to outcomes that are hard to avoid.

When combined, the Philippines has a lot of barriers to face to improve science literacy. The government, along with various educational sectors actively works hard to overcome these hurdles, but the greatest, and most daunting hardship of all is the poverty that permeates the country, its claws are hard to escape, and it seeps into the crevices of every plan made to eradicate its existence. The lack of promotion to pursue science literacy is not the problem, it's the difficulty in accessing the proper education for it. Rather than insisting on more emphasis, and more focus on advertising a science education, we should opt for developing more methods to abundantly provide quality science education for all. That starts with exterminating class disparity, focusing on lowering poverty levels if not completely wiping it out so that Filipino students won't fall into the seemingly endless cycle of becoming full-time breadwinners at a young age instead of continuing their studies.

Science education is expensive and takes an immense amount of collective effort to learn and teach proficiently. Many intertwining factors lead to its deficiency and the first step that third-world countries like the Philippines must take is to root out the cause and expunge it from there. In this case, all factors lead back to poverty, and we better start working on it promptly if we want to see changes as soon as possible.

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