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PROMOTING RESEARCH IN SECONDARY SCHOOLS: A COMPARATIVE STUDY OF MALAYSIA AND THE PHILIPPINES

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ABSTRACT

This comparative study examines the teaching of research in secondary schools in Malaysia and the Philippines, focusing on approaches, challenges, and outcomes. Both countries emphasize research and critical thinking in their education systems, but their methods and implementation differ. Malaysia integrates research into various subjects, while the Philippines incorporates it as dedicated courses in the senior high school curriculum. The study highlights the importance of research skills in fostering problem-solving, critical thinking, and adaptability to combat challenges like misinformation and to prepare students for global competitiveness. Despite shared goals, both countries face challenges, including insufficient teacher training, low student motivation, and an exam-centric culture. Recommendations include enhancing problem-based learning, prioritizing teacher professional development, and fostering collaboration between nations to improve research education. The findings offer insights into curriculum reform, promoting a research culture, and addressing skill gaps crucial for 21st-century education.

Keywords: *Research skills, critical thinking skills, Malaysian education system, Philippines education system*

INTRODUCTION

The Program for International Student Assessment (PISA) is the gold standard in assessing a country's quality of education. The assessment measures the ability of 15-year-olds to use their reading, mathematics and science knowledge and skills to meet real-life challenges (PISA). The 2018 PISA results revealed that the Philippines scored 353 in Mathematics, 357 in Science, and 340 in Reading, all below the average of participating OECDcountries (DepEd Report, 2019). The Department of Education determined key reform areas to improve the Philippine's performance in the assessment which indicates the quality of education in the country. They sought to reform four key areas:

> (1) K to 12 review and updating, (2) Improvement of learning facilities, (3) Teachers and school heads' upskilling and reskilling through a transformed professional development program; and (4) engagement of all stakeholders for support and collaboration. (DepEd, 2019)

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In 2019, then Secretary Leonor Briones admitted that it is a wake-up call for the DepEd with an urgent need to review the curriculum (Galvez, 2019). The DepEd then set forth plans to improve the K to 12 Basic Education Program through DO 21 s. 2019. One of the aims is to "Establish the components required to ensure the effective implementation of the curriculum" (DepEd, 2019). The DO presents important guidelines in the implementation of the curriculum from Primary School to Senior High School.

The inclusion of two years of senior high school is among the distinct improvements of the K to 12 Curriculum. The senior high school program is composed of the Core, Applied, and Specialized subjects. The core subjects ensure that all students acquire the competencies required for the specialization in the SHS tracks (DepEd, 2019). The applied subjects are contextualized according to the tracks. The applied subjects are English for Academic and Professional Purposes, Practical Research 1, Practical Research 2, *Filipino sa Piling Larangan*, Empowerment Technologies, Entrepreneurship, Inquiries Investigations and Immersion.

By adding Practical Research 1 and 2 in the SHS curriculum, the DepEd emphasizes the importance of a systematic teaching of research in basic education. This is important because through research, students' problem-solving and critical thinking skills are honed. Problem solving is a cognitive skill that has significant application in school and the outside world (Scott & Marzano, 2014). Problem solving strategies may be used by teachers to tackle lessons learned in Math, Science, History, Literature, or Social Studies. Students may also use these strategies in studying situations in current events or even their own situations so that they will grow as life-long learners.

Critical thinking and problem-solving are skills that every successful adult needs in making sound decisions, necessary in grappling daily challenges. According to Murawski (2014), the transfer of critical thinking skills from the classroom to the workplace is seen when individuals make effective, well thought out and tested decisions. This is supported by the World Economic Forum (2016) that listed the top three skills necessary in workforce and employment: 1. Complex Problem Solving, 2. Critical Thinking, and 3. Creativity. Students demonstrate proficiency in these top three skills in research class. Not only are the skills necessary in the workplace, it is also necessary to handle the reality of social media, information overload, and fake news.

In a Forbes article, Arnold (2018) laments intellectual laziness and passivity as reasons that many are fooled into believing the information that the internet is feeding us. To go against the grain, people need to exert effort to constantly sharpen critical thinking skills. The battle against fake news became even more palpable with the COVID19 pandemic. The WHO Secretary General Ghebreyesus, in the Munich Security Conference in 2020, said that "We're not just fighting a pandemic; we're fighting an infodemic," (Lancet Infectious Diseases Journal 2020). Misinformation of the public undermines the trust of health institutions and governments, and corrective action is therefore needed now more than ever. But hope is not lost as it is possible to have a critical eye in evaluating the validity of online resources and to defend against fake news and misinformation. Studying the URL or website domain and the registration date are good

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practices that can detect fake news (Mazzeo et al., 2021). This means, proper training in digital literacy and critical thinking can be solutions to fight disinformation. Schools can support this by training students in correct and methodical research that in turn will raise a discerning population.

The ASEAN Seniors Meeting on Education underscored strengthening education on media literacy to counter disinformation in the region and to enhance critical thinking among students about the impacts of information technology and social media in society (ASEAN, 2022). Even before the pandemic, ASEAN countries like Malaysia and the Philippines have taken initiatives to enact laws to improve the educational system to combat disinformation and fake news. Stringent laws against fake news and cybercrime were likewise crafted by the two countries as a response to the threat of misinformation and fake news.

Rationale

If the Philippines wishes to successfully participate in the global economy, then its policies on education, especially on raising globally competitive citizens who are research-oriented, must be studied side-by-side with those of other countries. A comparison with Malaysia, the next-door neighbor, may yield substantial results. The comparison of the two educational systems, specifically as regards teaching research in high schools, is the focus of this study. Comparative education, as a research framework, explores similarities and differences in educational systems and practices. Arnove (2019) defines it as a loosely bounded field that examines the sources, workings and outcomes of education systems, as well as leading education issues, from comprehensive, multi-disciplinary, cross-national, and cross-cultural perspectives.

Using the Sustainable Development Goals (SDG Index, 2022) for Education, the Philippines and Malaysia show the following comparative data:

Sustainable Development Goals for Education	Philippines	Malaysia
Participation rate in pre-primary organized learning *Participation rate in organized learning one year before the oficial primary entry age.*	86.29% as of 2019	99.26% as of 2015
Net primary enrollment rate *The percentage of children of the oficial school age population who are enrolled in primary education.*	96.95% as of 2019	98.59% as of 2019

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Lower secondary completion rate *Lower secondary education completion rate measured as the gross intake ratio to the last grade of lower secondary education (general and pre-vocational). It is calculated as the number of new entrants in the last grade of lower secondary education, regardless of age,divided by the population at the entrance age for the last grade of lower secondary education.*	83.09% as of 2019	84.92% as of 2019
Literacy Rate *The percentage of youth, aged 15 to 24, whocan both read and write a short simple statement on everyday life with understanding.*	98.39% as of 2019	96.79% as of 2019

Almost all but one of the categories under SDGs for Education index are relatively the same. The SDG on Education or SDG 4 is "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UN Sustainable Development Goals). Both the Philippines and Malaysia are rated the same for SDG 4: moderately improving but insufficient to attain the goal for education. As for the overall ranking including the other indicators of sustainable development, Malaysia outranks the Philippines.

The paper aims to study the teaching of research in secondary schools in Malaysia and the Philippines. The following questions will guide the study: Is research taught as a specific subject in the two schools? What are the similarities that Malaysia and the Philippines share regarding problem-solving, critical thinking, and research? What are the challenges encountered in teaching research?

The comparison is done through a review of literature, looking at the teaching of research using the two variables, the Philippines and Malaysia. The literature review aims to provide an overview on the teaching of research in the two countries incorporating other studies related to critical thinking and problem solving.

Significance of the Topic

A comparative study of the teaching of research in Malaysia and the Philippines including the developments and challenges is important for two reasons: to look at the similarities on how the two countries value the teaching of research in the time of the pandemicand the challenges the two countries share to improve research education.

Given that the two nations can be considered as lead countries of the ASEAN, what they

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will implement as regards curricular reform can impact the other member nations. In a global economy that is of serious importance. The sharing of information and experiences of the two countries, likewise, promotes cooperation and collaboration especially in recognizing and tackling the challenges in education.

Another possible significance is the Philippines' participation in global assessments of education. DepEd (2022) announced the participation of the Philippines in the 2022 PISA Administration for "monitoring improvements and for identifying gaps as well as areas of growth for basic education." Any policy guidelines related to improving education that are discovered through the study, specifically, critical thinking and problem solving, may help provide context in analyzing the PISA results.

Limitations

The study is limited to the educational systems of Malaysia and the Philippines. Other countries are not included in the study. Only the secondary education of the two countries are scrutinized. While the focus is on secondary education, studies conducted in the two countriesthat are about early childhood or tertiary education, as long as they have a connection with the topic of teaching research are also included in the study.

REVIEW OF LITERATURE

For purposes of this study, a semi-systematic review of literature is conducted with first determining the common themes of comparison and then answering the questions regarding the teaching of research in Malaysia and the Philippines.

Culture of Research and Development of the two Countries

World Bank Data (2022) from the UNESCO Institute of Statistics as to the number of Researchers in Research and Development (R&D) for every 1 million peoplereveal the level of activity as regards professional research conducted in the two countries. Malaysia has 2,185 for every 1 million people while the Philippines has only 174. The global average for R&D is 1,597 for every 1 million. Researchers are professionals researchers engaged in Research & Development (R&D), expressed as per million. Researchers are professionals who conduct research and improve or develop concepts, theories, models techniques instrumentation, software of operational methods (World Bank, 2022).

In 1991, Malaysia developed Vision 2020, a blueprint for turning Malaysia into a knowledge economy and a self-sufficient industrialized country by 2020 (SEA-EU-NET, 2017). The Ministry of Science Technology and Innovation launched the National Policy for Science, Technology and Innovation that cuts across all sectors of the economy with the aim to strengthen and mainstream science, technology, and innovation in all sectorsand levels of national socio-economic development. This has greatly improved R&D in Malaysia that translates to improved

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performance in rankings.

In the Philippines, the Department of Science and Technology is the primary agency for research and development with the primary mission to stimulate innovation in the country (DOST, 2017). The DOST aims to integrate research and development or R&D efforts through the Harmonized National Research and Development Agenda 2017-2022 towards the shared goal of inclusive socio-economic growth and a better lifefor Filipinos (HNRDA, 2017). Other than the DOST, Research and Development is mostly channeled to Higher Education Institutions. Only the top 5 universities in the country are performing research and four of the five universities are private institutions with the University of the Philippines as the only state university (SEA-EU-NET, 2017). According to Liwag (2020), the slow procurement process in acquiring research materials and the limited budget make R&D difficult to progress in the country.

Improvements in the Curriculum

Malaysia has 13 years of formal education with six years of primary education, three years of lower secondary, and two years of upper secondary, and two years of pre-university while the Philippines has 12 years of formal education with six years of primary, four years of lower secondary, and two years of upper secondary (International Bureau of Education, 2006). Interestingly, both countries have gone through three periods of educational reform and in the same periods. UNESCO (2014) identified these periods in both countries from 1980-84, 1995-99, and 2010 to present.

Malaysia launched the Malaysia Education Blueprint 2013-2025 where everychild will master a range of important cognitive skills, including problem-solving, reasoning, creative thinking, and innovation (Ministry of Education, 2013). The blueprint also emphasizes critical thinking and reasoning as the ability to analyze and anticipate problems and approach them critically, logically, inductively, and deductively to find solutions and make decisions. These tasks are best addressed through the teaching of research.

In the same year as Malaysia, the Philippine Government passed into law Republic Act (RA) 10533 or the Enhanced Basic Education Act of 2013. One of the standards and principles of RA 10533 is that the curriculum shall use pedagogical approaches that are constructivist, inquiry-based, reflective, collaborative and integrative (Enhanced Basic Education Act, 2013). The emphasis of inquiry-based learning as an approach is something worth celebrating as it promotes investigation andactive questioning.

According to Guido (2017), inquiry-based learning focuses on investigating an open question or problem that uses evidence-based reasoning and creative problem-solving to reach a conclusion, which students must defend or present. The process of inquiry usually starts with tapping the child's curiosity that leads them to critical thinking and understanding. An example of guided inquiry is the research project. Inquiry should ultimately drive students to view research as a means through which they can seek out new ideas, answer new questions, and wrestle with complex problems (Holland, 2017)

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Teaching of Research

The upper secondary level of Malaysia allows students to choose their subjects among four electives: Humanities, Vocational and Technical, Science, and Islamic Studies. The Core subjects in Lower Secondary are almost the same: Malay, English, Math, Islamic Education (for Muslims), Science, Integrated Living Skills, History, PE, Health, and Art (International Bureau of Education, 2006). Research is not taught as a separate subject in secondary school, but it is integrated with the other disciplines. Project work or course work is introduced in secondary schools to develop research skills, and it is through the Social Sciences (History and Integrated Living Skills) where students conduct project work (Meerah & Arsad, 2010).

In Philippine high schools, Research is an applied subject that is contextualized depending on the Academic Strands: Accountancy, Business, and Management (BAM); Humanities, Education, Social Sciences (HESS); and Science, Technology, Engineering, Mathematics (STEM) (DepEd, 2013). Practical Research 1 is taught for a semester that is focused on qualitative research. Practical Research 2 is also taught for a semester and focused on quantitative research.

Thinking Skills Needed in Research

After a test on scientific literacy inquiry, it was discovered that Malaysian students' levels of scientific inquiry are low to moderate (Corrienna et al., 2013). Malaysian teachers are also more comfortable teaching facts and expecting students tolisten with problem-solving demonstrated through analogies rather than given as activities (DeWitt, Alias, & Siraj, 2016). A study of the teachers' quality of questions revealed that teachers have a long way to develop their questioning and facilitation skills (Tan & Arshad, 2014). Yeoh (2018) surmised that despite the previous introduction of Problem-Based Learning (PBL), teachers are not implementing it in the classroom but are willing to try it after several hours of training. The need to improve pre-service training and professional development of teachers as regards higher order thinking skills is reiterated in the Malaysian Education Blueprint 2013-2025 (Ministry of Education, 2013). To ensure that students' skills of inquiry are elevated means starting first with developing the critical thinking skills of teachers.

Studies of critical thinking skills of Filipinos in high school also show similar results compared with those of Malaysians: the performance is below standards. A study of the thinking skills using a taxonomy of learning of particular ABM students in the Philippines revealed that their learning level in terms of remembering and creating isaverage and that for understanding, applying, analyzing, and evaluating the level is low (Gepila et al., 2022). Students' dispositions also have an impact on their ability to think critically. A survey of 240 students of Senior High students from the different strands proved that the problem solving attitude is significantly associated to the critical thinkingability of the students and those who have demonstrated high problem solving skills become successful (Moneva, Miralles, & Rosell, 2020). The teacher's skills also indicate low performance. Analyzing the 21st Century Skills Integration in the K-12 Program of the Philippines, a report indicated:

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> that the main focus of lessons was subject content and no discussion about application of skill, reflection on skills, skills relative to learning outcomes, or checking of understanding of skills through formative assessment… that 27% of observations contained collaboration, 21% of observations contained problem solving, and 13% of observations contained critical thinking (Scoular, 2020, p. 26).

Many teachers are still focused on coverage of content with little application to skills on collaboration, problem solving, and critical thinking. To address the urgent concern of improving research skills, DepEd released DO 39, s. 2016 or the Adoption of the Basic Education Research Agenda that encourages and gives incentives to teachers who pursue specific research topics and build a research culture tackling the many challenges of the biggest bureaucracy which is DepEd (DepEd, 2016).

Challenges in Teaching Research

A study by Palanisamy and Aziz (2021) revealed that other than the limited time given to the teaching of writing, the teaching methods, students' attitudes, and language ability are the challenges in teaching Malaysian students. Yoke et al. (2021) claim that the culture of examinations in Malaysia is also another challenge because teachers have been found to focus on finishing the syllabus and students exert more effort concentrating on answering exam questions rather than focusing on understanding. Research writing is also time intensive. Landicho (2020) found that majority of students included in his study struggle with time to write and have no prior experience in writing formal research or laboratory reports. Students' motivation can also be a barrier. According to Paurillo (2019) the top three challenges that research teachers have are students' lack of motivation in research writing, inability to paraphrase, and lack of interest in writing.

What Can Be Done

Instead of passively learning, students should be challenged to think about what to study and how to do it, at the same time given enough instructional support as they think critically of the world around them (Corienna, 2013). Ultimately, motivation is one important factor that has to be addressed together with building students' capacity to doresearch. Developing students' problem solving skills is another possible approach. Education experts Darrell Scott and Robert Marzano (2014) identified key recommendations for effective problem-solving that leads to success beyond school:

> In order to solve a problem, students must first be able to identify a problem and what obstacles or constraints limit their ability to find a solution. Once they define these aspects of a problem, students can evaluate the importance of what they wish to achieve, possible solutions, the help and resources available to them, and the likelihood of success. Teachers can ask students to use problem-solving strategies to examine conflicts encountered in history, literature, current events, and in

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> students' personal lives. Learning to use problem-solving strategies in everyday life can also help students view problems from new perspectives and approach long-term goals with less anxiety (pp. 116–122).

Teachers play a vital role. The most dominant suggestions are teachers' guidance assisting students in their writing tasks by giving feedback, providing samples for students to use as guide, providing clearer explanation on the task given and scaffolding (Palanisamy & Asiz, 2021) Students may be encouraged to read samples to be used as guides to have as constant exposure to academic writing (Pablo & Lasaten, 2018). Teachers should also include activities that minimize research anxiety like peer work or collaboration so that students are not overwhelmed (Landicho, 2020). A supportive learning environment can be modeled by teachers.

CONCLUSION

Malaysia is more advanced than the Philippines in cultivating a research and development culture and government initiatives can be attributed as one possible factor for its advancement.

Research is not taught as a specific subject in the Upper Secondary Level in Malaysia but is expected to be integrated in specific subjects, most specially in the Social Sciences. In the Philippines, Research is taught in two semesters in Senior High School.

Students' scientific inquiry, problem solving and critical thinking skills of both countries are still considered as improvement areas. The shift from a teacher-centered to learner-centered learning culture has yet to be achieved by both countries.

Research Writing is a complex task and time must be devoted for it to be effectively implemented. Knowing the students' levels of proficiency and properly motivating them can lead to more favorable outcomes.

RECOMMENDATION

Problem based learning should be implemented in the earlier levels as it promotes a research mindset. Teachers regardless of academic discipline must be given intensive training on academic and technical writing. This ensures consistency in demand for quality work expected of students.

There are many possible factors that impede the effective teaching of research such as literacy and demographics. These may be explored in further research.

Finally, since it yields rich learning, more studies comparing the Philippines with other countries should be encouraged.

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