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RESEARCH ARTICLE

BEST PRACTICES IN TEACHING GRADE IX BIOLOGY IN PUBLIC HIGH SCHOOLS IN ISABELA PROVINCE, PHILIPPINES

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Best Practices In Teaching Grade Ix Biology In Public High, Schools In Isabela Province, Philippines

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ABSTRACT

Background: With the advancements of education sector around the world, this study aims to compile the practices of public high school teachers teaching Grade 9 Biology and determine which of these said practices are the best. **Objectives:** The objective of this research is to know the practices of science teachers in teaching grade 9 biology and to determine which of these practices are considered to be the best. **Methods:** This research utilized a qualitative-quantitative method using a structured interview form administered through Google Forms. This form was divided into four parts, agreement, personal information, checklist proper, and percentage. The data gathered was treated with descriptive analysis and cross tabbing. **Results:** The top 5 practices are: (1) humor, (2) giving clear and concise instructions, (3) engaging students in class, (4) asking questions that will make the students think, (5) giving examples that can be observed in real-life and examples that are relatable. **Conclusions:** The teachers and students alike call for an education curriculum that is timely, relevant, and engaging. A curriculum that will not only answer to the need of mind but also to the need of the body and the heart. To have a meaningful learning, the path of instructions must be set clear at the very beginning of every lesson to give a sense of direction for the students and for them to know what the end goal we are trying to achieve.

INTRODUCTION

Utilizing best practices in classroom positively impacts students by providing motivation to learn and promoting success in a global world (Reddington & Canada, 2006). K-12 was implemented to make learning meaningful and relevant. To make sure that the new curriculum is well implemented, best approaches, strategies and practices are needed. Best practices are inherent part of a curriculum that amplifies the connection and relevance identified in educational research (Myriam, 2014). They interject rigor into the curriculum by developing thinking and problem-solving skills through integration and active learning. Relationships are built through opportunities for communication and teamwork. Best practices are applicable to all grade levels and provide the building blocks for instruction. Best practices motivate, engage and prompt students to learn and achieve. Students who receive a balanced curriculum and possess the knowledge, skills, and abilities to transfer and connect ideas and concepts across disciplines will be successful as measured by standardized tests and other indicators of student success. Four best practices for teachers include teaching a balanced curriculum, teaching an integrated curriculum, differentiating instruction to meet individual student needs, and providing active learning opportunities for student to internalize and maximize learning (Spaulding, *et al*., 2009). K-12 educators today are addressing this issue through inquiry, a strategy in which students are shown how to explore their world through a systematic and investigative process. Writers of the United States' curriculum framework Next Generation Science Standards (NGSS) have identified and addressed this need through Engineering content and Science and Engineering Practices (Slater & Kasza, 2016). Academies are one approach to fulfilling this hands-on ideology as they are located in high schools where students work in an environment that connects their science, math, and engineering classes, ideally resulting in a real-world experience. These schools offer a realistic hands-on and collaborative environment. Students spend most of their time working together, with their teachers, and community members to solve real-world problems (Mustapha, Rahman, &Yumus, 2010) [5]. Thomas L. Friedman, author of "The World Is Flat", refers to a twenty-first century world that will be very different from the one in which we were educated. To survive in a new, globally competitive world, today's children will need creativity, problem-solving abilities, passion for learning, dedicated work ethics and lifelong learning opportunities. Students can develop these abilities through instruction based on Best Practice teaching strategies. Integrated science education – the combination of the subjects Biology, Chemistry and Physics – and its implementation for the German school system is currently being discussed. Various implementations of integrated science curricula exist in the different federal states for students ranging from grades 5 through 10.

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In Germany, teacher education at the university level and in teacher training centers focuses on the individual subject. Pedagogical content knowledge is taught at university level within the disciplines Biology Education, Chemistry Education and Physics Education instead of science. In particular, teacher education programs are organized according to these subjects and do not properly prepare for the demands of integrated science instruction. With all of these advancements in the education sector around the world, our country needs to cope up. And to do so, we need to make our own version of best practices that are really working for our current situation. Therefore, this study will lead to the development of a compilation of best teaching practices material for teachers teaching grade 9 biological sciences. It will not only benefit the teachers but also the students who will in the future continue the said research.

MATERIALS AND METHODS

Design: This research will utilize a qualitative-quantitative method using observation and interview technique as research design. This method fits the need because the researcher will be utilizing an experts' validated observation sheets and structured interview via checklist in gathering data about the practices in teaching grade 9 biological science.

Environment: The researcher chose to conduct the study in Isabela Province because the researcher wants to determine the best practices of teacher teaching grade 9 biology science in public schools in the said province.

Samples and Sampling Procedure: In the province of Isabela there are two cities and thirty-four municipalities; in each there are at least one public high school (Aurora, Dinapigue, Maconacon, and Naguilian) up to sixteen at most (Ilagan City). For better representation and a reliable data set, the researcher decided to get one school from each municipality and city with five and below number of public high schools; two for those who have six to ten public high schools; three for those who have eleven and above. These schools were chosen through fish bowl technique.

Instrumentation: This study will be utilizing a checklist to gather the necessary information to come up with a significant result. This checklist is divided into four parts: agreement, personal information, checklist proper, and percentage. The first part, agreement, shows a term about the confidentiality that the researcher will take in gathering and processing the information that they have provided. The second part is the personal information page, this part will get their name (optional), gender, age, school, and if they are a student or a teacher. Based on their choice, they will be directed to a checklist. If they are a teacher, they will be redirected to teacher's checklist; if they are a student, they will be redirected to student's checklist. The checklist will end in two short essay questions to further the data collection. The fourth and last part will ask them to put a percentage to certain tasks that they do in a month. Furthermore, the instrument is made in Google Forms, and is therefore only available and accessible through the internet. This choice was made as a result of certain parameters to avoid contracting COVID-19 disease.

Treatment of Data: The data gathered will be treated with statistical treatments such as descriptive analysis. Descriptive analysis was chosen to detect the distribution of data and the outliers. By doing so, the researcher can immediately fix the data set before going into another and more complicated statistical treatment. This analysis will also help the researcher to look for associations among variables that were not accounted for earlier.

RESULTS

The objectives of this research to know the practices of science teachers in teaching grade 9 biology and to determine which of these practices are considered to be the best.

Table 1. Textbook Usage Of The Respondents

Do they use textbook in biology?	Yes	No	Total
Teacher	13	13	26
Student	40	12	52
Total	53	25	78

Table 2. Internet As Sources Of The Respondents

Do they use internet sources in the classroom?	Yes	No	Total
Teacher	15	11	26
Student	40	12	52
Total	55	23	78

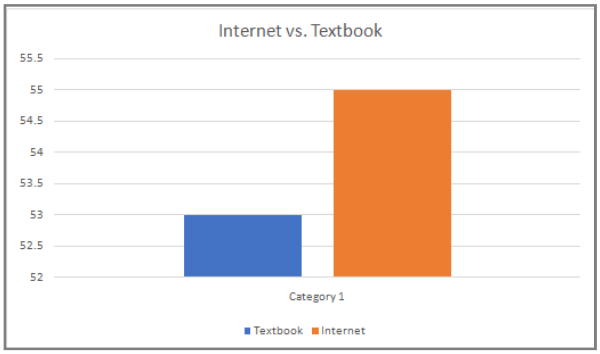


Figure 1. Internet vs. Textbook

Table 3. Access to the internet

Do they have access to the internet?	Yes	No	Total
Teacher	12	14	26
Student	40	12	52
Total	52	26	78

Table 4. Internet For Educational Purposes

Do they use internet for educational purposes?	Yes	No	Total
Teacher	13	13	26
Student	37	15	52
Total	50	28	78

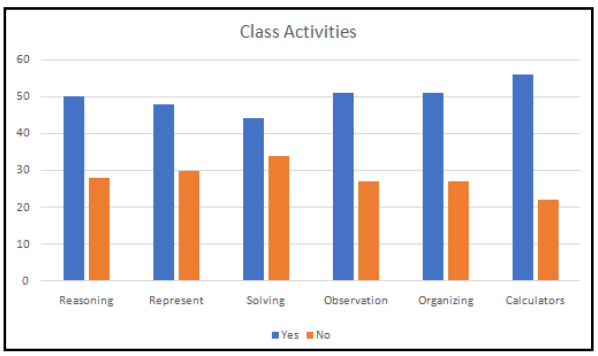
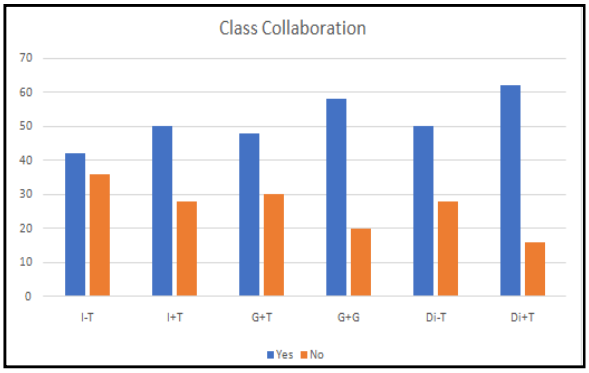


Figure 2. Class Activities



I-T Individual work without teacher assistance
I+T Individual work with teacher assistance
G+T Group work with teacher assistance
G+G Group work with cross-group work
Di-T Diads or group of two without teacher assistance
Di+T Diads or group of two with teacher assistance

Figure 3. Class collaboration

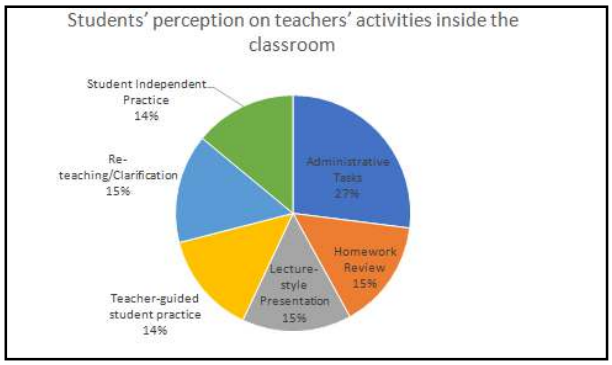


Figure 4. Students' perception on teachers' activities inside the classroom

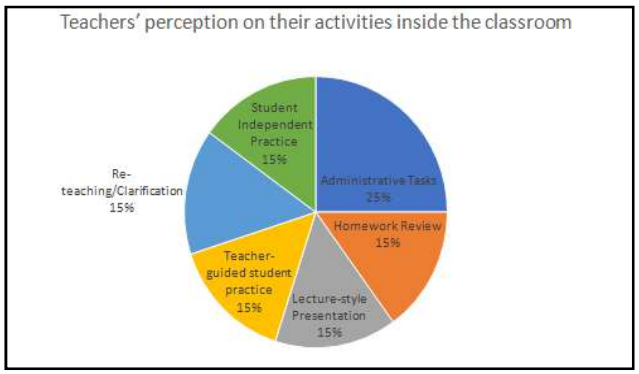


Figure 5. Teachers' Perception On Their Activities Inside The Classroom

Aside from this, this research also aimed to look at the trend in teaching science in the new normal that is seemed to be working. This research utilized a qualitative-quantitative method using a structured interview form administered through Google Forms. This form was divided into four parts: agreement, personal information, checklist proper, and percentage. The data gathered was treated with descriptive analysis and cross tabbing. With the data gathered, the following are the best practices in teaching grade 9 science here in the province of Isabela: humor, clear and concise instructions, engage students, questions that will make the students think, giving examples that can be observed in real-life and examples that are relatable, give students realistic and motivating feedback, accommodate students' learning styles, use concrete to abstract, discovery approach, or empirical approach in class · Make sure not just to focus in cognitive domain but also to psychomotor and affective domain to develop a meaningful learning, always align the objectives, instructions, and assessment to avoid confusion, set high expectations to the students that are also attainable, and clarify the objectives at the beginning of the class to provide sense of direction for the students. On the other hand, self-paced learning and technology integration are the trends in teaching grade 9 science in public high schools in the division of Isabela.

DISCUSSION

This study mainly aimed to look at the practices of teachers with grade 9 biology load and to see which of these said practices are the best and which of these practices seemed to be working pretty well in pandemic. Based on the data gathered by the researcher, 50% of the teacher-respondents still uses textbooks in teaching while the other group do not. On the students' side, 77% of them still uses books in learning biology. In terms of internet, 58% of the teachers use it as a teaching resource inside the classroom. All in all, a total of 65% of respondents that uses the internet for educational and instructional purposes. These data show us that even though teachers still rely on books, there is actually a growing demand for online teaching-learning resources. Unfortunately, there is still 33% of the total respondents who cannot cope up with this information revolution. In terms of class performance or activities it was shown that most of the times, teacher ask their students to use calculators in solving exercises and problems that are given to them. The second most likely thing to be done inside a classroom is writing explanations on why and how their observation happened tied with arranging objects or events in order and explaining why the student arranged it that way. This is followed by explaining their idea behind a general idea or concept that was presented to them in class. The least likely to be done inside the classroom is to solve problems without an immediately obvious method of solution. This may be accounted for their subject being a biological science which in its curriculum doesn't have much of problem solving.

When it comes to how the teacher maneuvers their classes into collaboration it was shown that most of the teachers usediads with teacher assisting them. This is a possible application on the teaching approach of 'think-pair-share' where students are given something to think on individually, then theyfind a partner to share their thoughts about the idea given and discuss it with them. This is an excellent idea to motivate your students and get their head in the class. This will also make your pre-assessment about their common misconceptions easy thus giving you abetter grasp on which part of the lesson to focus. The second would be the students will form their own groups and collaborate with one another. One excellent application of this is the 'jigsaw puzzle' approach where the students are grouped and are given a unique topic to discuss. This will be their 'expert group'. After the expert group become expert on their own topics, the expert group will be broken down and a new grouping will be formed. The groupings must at least have one representative from each of the expert group because everyone will be sharing what they' velearned on the expert group to their new group. The third are individual work with teacher assisting and diads with teacher assisting. It can be seen as an indicator that whatever the students are doing inside the classroom, the teachers are always at the side and assisting the whole class.

In this study, the researcher also looked on the perception of students and teachers on what the teachers are really doing inside the classroom. Apparently, the student respondents believe, that27% of the time, teachers are doing administrative tasks or any work that are not directly related to teaching. Which is a sad truth because our teachers should be focusing more on teaching the future of our country and not to be bombarded with paper works that could be done by other people. Not so surprisingly, the number one perception of teachers is coherent with students', they too believe that 25% of their time are allotted to administrative works that are not directly related to teaching.

Finally, students believe that their teacher's best practices are engaging them in the class, asking them questions that will make them think; giving clear instructions and relating the lesson to real-life by giving examples that they can observed on a daily basis or examples that they can relate to. Aside from these, the students also say that humor is a plus. The teachers are very thorough on the practices that they believe are the best in teaching science. They all agree with the answers of the students however there was no answer that is coherent with humor. In addition to this, they also said that accommodating students' learning styles is favorable. Set high expectations to motivate and challenge students' thinking. Clarify the objectives at the beginning of the class and don't forget to align your objectives, instructions, and assessment so that your students will not be confused on what is happening inside the classroom. The teachers also named some approaches that they deemed to be effective inside their classrooms, the first one is concrete to abstract or inductive approach, next is discovery approach, and the last approach that they have named is the empirical approach.

CONCLUSION

In conclusion, the teachers and students alike call for an education curriculum that is timely, relevant, and engaging. A curriculum that will not only answer to the need of mind but also to the need of the body and the heart. To have a meaningful learning, the path of instructions must be set clear at the very beginning of every lesson to give a sense of direction for the students and for them to know what the end goal we are trying to achieve. The new challenges in our society imposes an opportunity for us to evaluate and recalibrate our curriculum to the needs of our students and our country. Such challenge is the COVID-19 pandemic that didn't just shake the health sector but all of the sectors of the society including education. Now is the best time to think and reflect, how can we better teach our students?

CONFLICT OF INTEREST STATEMENT

The author declares that there's no conflict-of-interest present in this study, its respondents, and its researcher. Funding was provided by the Department of Science and Technology through scholarship program. However, the declaration of no conflict of interest still stands since publication of a research is a core requirement in the author's graduate degree.

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This study was funded by the DOST through the CBPSME.

Glossary of Abbreviations

CBPSME Capacity Building Program for Science and Mathematics Education
COVID-19 Corona Virus Disease 2019
DOST Department of Science and Technology
K-12 Kinder to Grade 12
NGSS Next Generation Science Standards

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