

INNOVATION OF SENIOR HIGH SCHOOL SCIENCE TEACHERS

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ABSTRACT: This is descriptive research employed quantitative and qualitative elements as it explored the innovations implemented and the administrative support provided among the senior high school science teachers in Castilla, Sorsogon Philippines. The study obtained data from the thirty purposively selected Senior High School Science Teachers through interview and survey and were analyzed and interpreted using simple statistics like frequency count, percentage, and ranking as well as thematic analysis and presented using tables and narratives. The study revealed innovations **in terms of teaching strategies** which include: “Modified Group Dynamics-based on online games characters, robots (acting out) use in groupings and role playing”, “Memes-based Picture Analysis”, and “Social media-based Teaching Strategy using Likes, Shares, Comments”; in terms of **Learning Assessment**, the minimal innovations include; Modified 4 pics 1-word, (role playing, contest/games), Projects with social media integration (posting of projects in their Social Media accounts/class FB pages), and *Adapted Online learning applications (kahoot.com)*. along **School Management of and Projects** linkages to some international private advocacy organization eg. Intervida and Green Valey were revealed. There were minimal administrative support to innovations related activities: along **Facilities and Equipment, Sources of Fund, Capability-building activities, and Rewards and Incentives**. The innovations made students view their learning activities as; “**Active and engaging**”, “**Motivating and insightful**”, and “**Going beyond the minimum**”.

KEYWORDS : *Innovations, Senior High School Science Teachers, Teaching Strategies, Learning Assessment, School Management of projects.*

I. INTRODUCTION

Education, according to (Serdyukov,2017) being a social institution serving the needs of society is indispensable for society to survive and thrive. It should not only be comprehensive, sustainable, and must continuously evolve to meet the challenges of the fast changing and unpredictable globalized world. Rapid changes of modern world have caused Secondary and Higher Education System to face a great variety of challenges, with this in mind, educational system is necessitated to discover new, creative, useful, and effective strategies employed in teaching and learning (Bidabadi et.al 2001). Innovation in teaching happens when teachers are open minded. They use skills for reflection, questioning, deconstruction, and reconstruction. The aim is to guide and help the students to learn the needed critical thinking and creativity skills correctly. The focus of innovative teaching is based on the trust that every student has the capacity to learn and be successful in life. A teacher should perceive each student as possessing unique personality characteristics that can be more polished by using creative and innovative teaching methods (Westwood,2013). They should be innovative in their teaching methods and should adopt different strategies to facilitate every single individual of their classroom according to the capabilities and differences of students.

Teaching innovation according to (Chen,2013), means the teachers having creativity, being able to reflect on, to design and to apply new, diverse teaching methods or activities, understanding individual differences of students, stimulating students’ learning motivation and interests, enhancing the students’ learning effectiveness in the preparation before teaching, in the process of teaching and in student assessment. Teaching innovation means teachers being creative and showing vivid and lively teaching methods to make students interested in learning, thus enhancing the teaching effectiveness. The purpose of teaching innovation for students involves: 1) developing student capabilities for independent analysis, thinking and judgment; 2) stimulating student interest and motivation for learning; 3) tapping student potential in creativity and problem-

solving; and 4) enhancing students' learning ability. The purpose of teaching innovation for teachers involve: 1) enhancing teaching quality and effectiveness; 2) having rich and diverse teaching content and methods; 3) having a diversified student assessment; and 4) achieving educational goals and ideals. (Chang & Wang, 2015). Innovative teaching involves using innovative methods and teaching learning materials for the benefit of students (Mandula, Meda, & Jain, 2012). According to Anderson and Neri (2012), innovative teaching can involve virtual labs: learning activities based on real-life problems; learning environments with equipment, furnishings, materials, and audiovisual resources; and learning guides for students and the teacher. All of these are combined with methodologies that promote the use of active teaching techniques that help teachers develop their students' learning abilities. The key advices to teachers teaching students from diverse backgrounds are to know and respect their students; offer students flexibility, variety, and choice; make expectations clear; use accessible language; scaffold students learning; be available and approachable to guide student learning; and be a reflective practitioner (www.lowses.edu.au).

Osborne and Hennessy (2013) said that to meet the new aims for science education, the science curriculum is poised to move in a new direction. The approach taken by the proposed new science curriculum for all pupils is eminently well-suited to the supportive use of interactive digital technology. As the school curriculum begins to forge links with the external scientific and social communities, opportunities arise for ICT use to play a central and core role in supporting development of scientific reasoning and critical analysis skills. Those in the process of developing new digital tools for use in the science classroom need, therefore, to engage with the new aims of science education and the science curriculum, and to develop resources that can be used by teachers both in facilitating key aspects of scientific thinking and in building bridges between schools and with the wider social and scientific communities. Furthermore, Educational innovations can improve learning outcomes and the quality of education provision. For example, changes in the educational system or in teaching methods can help customize the educational process. New trends in personalized learning rely heavily on new ways of organizing schools and the use of ICT. Second, education is perceived in most countries as a means of enhancing equity and equality. Innovations could help enhance equity in the access to and use of education, as well as equality in learning outcomes. The education sector should therefore introduce the changes it needs to adapt to societal needs. For example, education systems need to adopt teaching, learning or organizational practices that have been identified as helping to foster "skills for innovation" (Dumont et al., 2010; Schleicher, 2012).

Lardizabal, et. Al (2009) mentioned that in teaching, computer is a very important learning material where lessons can be fed into it and store in it. The stored learning materials can be brought whenever and wherever it is needed. Since the world is evolving when it comes to technology, as an educator we should now be fully aware on how to integrate technology in our way of teaching since it is now being utilize by almost all the people especially the students. According to Clemente (2009), the teachers must have the knowledge and skills in using computers. Teachers must now be familiarized about the hardware and software for the student's use. Teacher should explore the limits of information technology to facilitate teaching and learning. They must be creative enough to innovate teaching materials to be utilized inside the classroom. Teachers need knowledge in two broad categories. First, they need to be able to identify and develop technologies into tools for meaningful science learning, and this means knowing what technology offers for such learning and what effective use looks like in practice. Second, they need a useful portfolio of technologies that engage students in meaningful learning, and this means knowing about specific tools and resources that they can use in their teaching. Rather than more technical knowledge – about emerging technologies, or networking, or hardware – what teachers need is knowledge of curriculum-based technologies that work with both the ways teachers teach and what students need to learn. Multimedia allows lecturers to integrate text, graphics, animation, and other media into one package to present comprehensive information for their students to achieve specified course outcomes. It permits the demonstration of complicated processes in a highly interactive, animated fashion and that instructional material can be interconnected with other related topics in a more natural and intuitive way. (Crosby & Stelovsky, 1995).

In the Philippines, classrooms are becoming more diverse which poses challenge to look for teaching and learning strategies along with the diversity of learners. In the last three decades, innovative teaching strategies and methods dealt with the diversity of today's students worldwide. (Barakzai, 2014). Applying innovations in classroom is determining appropriate strategies and skills which can be applied using technology (Bruce 2013). The recent National Achievement Test (NAT) results is declining. The poor academic performance may be caused by either external or internal factors. External causes include school environment, social interaction, teachers, and teaching techniques. While internal involve problems at home as well as children's emotional state and maturity. More specifically, poor academic performance in Science of Castilla Cluster Sorsogon is a serious issue that should be addressed. Some parents of Castilla, Sorsogon may not have

employed and developed among their children the value of study habits along with responsibility and perseverance in their studies. They may not have been interested in knowing what school progress, hence, parents less support may have significantly affected their students' performance in school. Taking a proactive attitude in dealing with the situation is beneficial both for parents and for students. The collaboration of teachers and engagement in innovations to help the students cope in their poor academic performance in science is critical. The improvement of performance of the students in Castilla Cluster, requires looking into the competence of teachers in making their classes more interesting and engaging. Hence, this study exploring the innovations made by science teachers in their pedagogical practices and support manifested by schools towards innovation is conducted.

II. RESEARCH QUESTIONS

The study explored the innovations conducted and the administrative support extended to the Senior High Science Teachers in Castilla Sorsogon Philippines for School year 2019-2020.

1. What are the innovations applied by Senior High School Science Teachers along:
 - a. Teaching Strategies
 - b. Assessment of Student Learning
 - c. Management of School Programs & Projects
2. What are the administrative support provided to the Teachers in their innovations in terms of;
 - a. Facilities & Equipment
 - b. Funding
 - c. Capability-building Activities
 - d. Rewards and Incentives
3. How did the innovation made by the teachers enhance the performances of the students and the School?

III. METHODOLOGY

A. *Research Design*

This is descriptive research employed quantitative and qualitative elements as it explored the innovations implemented and the administrative support provided among the senior high school science teachers in Castilla Sorsogon Philippines. The respondents of the study were the thirty Senior High School Science Teachers which were selected purposively and sampled as total enumeration among the four schools in Castilla cluster II. The study gathered data through interview and survey. The gathered data were analyzed and interpreted using simple statistics like frequency count, percentage, and ranking as well as thematic analysis.

B. *Research Respondents*

The purposive random sampling technique was utilized to gather responses from 30 purposively chosen Senior High School Science Teachers in Castilla Sorsogon Philippines. The respondents come from identified Senior High Schools in Castilla Cluster 1 which include; Castilla National High School, San Rafael National High School, Mayon National High School and Oras National High School.

C. *Data Analysis*

The data gathered from the respondents' answers were interpreted and analyzed using simple statistics like frequency count, ranking and percentage as well as narratives. Content analysis was used in describing and analyzing the identified innovations implemented by the senior high school science teachers as well as the perceived effects of the innovations in the performance of the students. Frequency count and ranking were employed in the analysis of the administrative support provided in the innovations conducted in schools along facilities and equipment, funding, capability-building activities, and rewards and incentives.

D. *The research instrument*

The instruments employed in this study are the interview guide in determining the innovations implemented by the senior high school science teachers as well as the experiences of students with the applied innovations and its effects to their performance, and survey checklist in determining the administrative support provided by the selected schools towards innovations. The interview guide presents 3 questions which were designed for the teachers to identify and describe the innovations they conducted in the teaching science and how it affected students' performance. The questionnaire employed in the study is presented in a checklist format and was answered with multiple responses describing the administrative support provided for teachers' innovations along facilities and equipment, funding, capability building activities, and rewards and incentives.

E. *Data gathering procedure*

The researcher sought permission and consent for the conduct of the study through formal communication to the concerned offices, secured an endorsement from the School Division Superintendent of the Department of Education Sorsogon Province as well as the Castilla Cluster supervisor and the Secondary School Heads as well as the selected senior high school science teachers of the selected secondary schools. Before the actual administration of the questionnaire and interview to the respondents, the researcher subjected the instruments to his advisers and panel scrutiny after the feedbacks and recommendations were integrated to the instruments, a dry run was conducted in Oras National High School, Castilla, Sorsogon. Based on the comments and suggestions the questionnaires will be further reviewed and revised and with the approval of the review committee, a final questionnaire was made for the actual administration of data gathering.

Questionnaires were distributed to the respondents and provided them enough time to answer. During the actual survey, questions were explained before the respondents answered the questionnaires for clarifications. Upon the retrieval, the researcher organized, tallied, and collated the respondents' answers. All the data provided by the respondents were kept private and confidential.

IV. RESULTS AND DISCUSSION

Significant findings study was:

1. There were innovations applied by the senior High School Science Teachers in Castilla Cluster II which include; **Innovation in terms of teaching strategies** namely; 1. "Modified Group Dynamics-based on online games characters, robots (acting out) use in groupings and role playing" , 2. "Memes-based Picture Analysis", and 3. "Social media-based Teaching Strategy using Likes, Shares, Comments". Each of the teaching strategies innovations were conducted by the teacher respondents in the classes which improve the level of engagement among their students. While, along **LearningAssessment**, minimal innovations were conducted among these are; 1. Modified 4 pics 1-word, (role playing, contest/games), 2. Projects with social media integration (posting of projects in their Social Media accounts/class FB pages), and 3. *Adapted Online learning applications (kahoot.com)*. All three learning assessment innovations were either a product of modification or contextualization, and adoption. Furthermore, along **School Management of and Projects** very minimal to no documented innovations were done by most of the schools and teachers in the Castilla Cluster II, however noteworthy is the linkage established with some international private advocacy organization eg. Intervida and Green Valey

2. The Senior High Schools in Castilla Cluster II have provided or extended administrative support to innovations related activities: along **Facilities and Equipment**; which include; ventilated classrooms and minimal computer lab room with few internets' connectivity. Along **Sources of Fund**, it is noted that the schools MOOE of Senior High Schools is the only source of funds. Along **Capability-building activities**; in-service trainings like seminar and workshops, as well as assigning tasks or designation, and attending conferences and contests; along **Rewards And Incentives** include; granting of service credits, awarding the outstanding teachers, and minimal monetary incentives were provided to teachers.

3. The innovations conducted by the selected Senior High School Science Teachers have made students to view their learning activities as; "**Active and engaging**"- The innovation is empowering, its active and allow students to get interested to engage. "**Motivating and insightful**"- The innovations in teaching strategies, and assessment of learning *and* "**Going beyond the minimum**".

V. CONCLUSION AND RECOMMENDATION

Conclusions

1. There Senior High School Science Teachers **Innovated along teaching strategies, LearningAssessment, and School Management of and Projects.**

2. The Senior High Schools in Castilla Cluster II have provided or extended administrative support to innovations related activities: along **Facilities and Equipment; Sources of Fund, Capability-building activities and Rewards and Incentives.**

3. The innovations conducted by the selected Senior High School Science Teachers have made students to view their learning activities as; "**Active and engaging**", "**Motivating and insightful**" *and* "**Going beyond the minimum**".

Recommendations

1. The school heads may lead in rallying their teachers and school towards an innovation friendly school culture in as much as encouraging every teacher across the curriculum to engage in innovation in their instruction and practices in the classroom.
2. The Senior High Schools in Castilla Cluster II may consider putting administrative support to any innovation related activities as an important component of school planning like SIP, SBM and the like.
3. A thorough study on the lived experiences of the students reflecting the effects of the innovation in their learning.
4. Researches on innovation related activities, practices, outputs, outcomes, and impacts may be considered by any prospective researchers.

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