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The integrative approaches in teaching science in Vinisitahan National High School

Annalisa B. Bataller
Vinisitahan National High School
Bacacay, Albay, Bicol Region, Philippines
Email: annalisa.bataller@deped.gov.ph

Rafael C. Kallos*
Daniel B. Peña Memorial College Foundation, Inc.
Graduate Studies Department
Ziga Avenue, San Juan, Tabaco City, Philippines

Abstract: This study explored the integrative approaches utilized by secondary teachers in teaching Science of Bacacay Districts, school year 2022-2023. It followed a quantitative design using a descriptive-survey method. The researcher employed frequency counts, percentage, weighted mean and ranking. Further, the F-test was applied to test the hypothesis that there is no significant difference on the level of integration of the integrative approaches between the Junior and Senior High School teachers of Vinisitahan National High School at 0.05 level of significance. The respondents were sixty-four (64) secondary teachers of Vinisitahan National High School. Forty-seven (47) of whom are Junior High School teachers and seventeen (17) Senior High School teachers. The results revealed that there are fifty-seven (57) or 89.09 percent of the secondary teachers integrate inquiry-based learning. It is followed by around 89.09 percent inquiry-based learning is the most commonly integrated. The level of appreciation of the integrative approaches as rated by the Junior High School and Senior High has an average weighted mean of 4.16 in active learning; 4.03 in cooperative learning; 3.84 in inquiry-based learning and in collaborative learning with 3.81. The F-computed values in the four (4) approaches shows the in active learning, is 1.714; in collaborative learning (0.028); in cooperative learning, the value was 0.176 and in inquiry-based learning, the computed F value is 3.80. These values are lower than the F-tabular value at 0.05 level of significance with degrees of freedom 1 and 8 which is 5.318; 4. The challenge considered as the top from among the three (3) challenges in each of the approach was lack of appropriate learning resources to provide varied activities in active learning; individual differences among students in collaborative learning; dependence on others for solutions in cooperative learning; and lack of appropriate technology to implement inquiry-based learning in inquiry-based learning. 5. To improve the use of integrative approaches, the researcher prepared a lesson plan using collaborative and inquiry-based approaches in the teaching of science concepts. The selected topic dealt with plant cell included the teaching of Science for Grade 7 students. The lesson involved the part of the plant cell and integration of concepts to real world applications.

*Corresponding author**

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INTRODUCTION

Over the years, a great transformation had been observed not only in the way humans adapt to new knowledge in science and technology but also the way how education is delivered to explore the knowledge-driven era. This change in education is a reflection of the need for innovative and creative minds. It also manifests that teachers and learners all over the world have to be

introduced to modern teaching approaches and are provided with sufficient experiences so they can create opportunities for themselves and others. Modern teaching approaches such as collaborative, integrative and interactive methods provided teachers with techniques that will help students to explore in depth and enjoyable learning of new topics especially in Science. Students are able to discover their real-life inclinations to develop new interests which allow them to develop creativity and self-discovery.

These modern methods can help prepare our students for the challenges of the real world and equip them with knowledge which will nurture their intellectual, emotional and social well-being. The integrative approach is more activity-based and centers on the learners which involve them entirely into the process of learning. Through this way, learners actively participate in the whole process to build their knowledge and sharpen their skills. The teacher leads the learners and guides them to focus on the learning tasks. This all done by engaging in the activities and by adopting innovative modern teaching approaches. It has been observed that integration of Science concepts in the secondary schools offers an opportunity for students to appreciate real life teaching and learning.

Statement of the problem

This study aimed to:

1) Determine the integrative approaches used by the secondary teachers in teaching Science;

2) Ascertain the level of integration of active learning, collaborative learning, cooperative learning and inquiry-based learning in teaching Science;

3) Test if there is a significant difference on the level of integration of active learning, collaborative learning, cooperative learning and inquiry-based learning between the Junior and Senior High School teachers in Vinisitahan National High School.

4) Identify the challenges met in the use of integrative approaches; and

5) Prepare instructional materials to improve the use of integrative approaches.

METHODOLOGY

Research design

This study utilized a descriptive-survey that followed a comparative study that tested the difference on the on the level of integration of active learning, collaborative learning, cooperative learning and inquiry-based learning between the Junior and Senior High School teachers in Vinisitahan National High School. Vizcarra (2003) noted that descriptive studies are useful in obtaining the prevailing status or condition of the problem which are essential in understanding the past and the future. This study obtained various data from a limited number of respondents such as the different integrative approaches employed by the secondary teachers in Vinisitahan National High School, the level of integration of active learning, collaborative learning, cooperative learning and inquiry-based learning and the challenges met in integration of the above-mentioned approaches.

Respondents and locale of the study

The respondents of the study were forty-seven (47) Junior High School teachers and seventeen (17) Senior High School teachers of Vinisitahan National High School.

Research instrument

A questionnaire was the research tool of this study. The respondents were asked to select from the approaches such as active learning, collaborative learning, cooperative learning and inquiry-based learning to identify the approaches that they integrate in teaching Science in the classroom. This is the first part of the tool. Multiple responses were allowed.

The second part determined the level of integration of the approaches. The respondents were requested to rate the level of integration of the four (4) approaches indicated in the first part. There were different indicators in each of the components. The respondents were guided by a five-point Likert scale in their answers. The last part of the tool identified the challenges met in the use of integrative approaches. A pre-set of challenges was listed in each approach and the respondents selected from the given option if they perceived that the item or items were the challenge/s they met. The respondents can check as many challenges they meet.

Data analyses procedure

Descriptive statistics like frequency count and percentage were used to determine the approaches commonly integrated in teaching Science in Vinisitahan National High School. Weighted mean was employed in the computation of the level of integration of the approaches such as active learning, collaborative learning, cooperative learning and inquiry-based learning. The F-test was used to test of the significance on the difference of the level integration of the approaches between the Junior and Senior High School teachers. Furthermore, frequency count and ranking were employed to identify the challenges met in the use of integrative approaches.

DISCUSSION OF FINDINGS

The approaches integrated in teaching Science

There were fifty-seven (57) or 89.06 % of the teachers in Vinisitahan National High School who used inquiry-based learning as an approach in teaching Science concepts. This was followed by fifty-two (52) or 81.25 % that employed active learning. Forty-eight (48) or 75.00 % utilized cooperative learning and forty-five (45) or 70.31 % used collaborative learning.

The level of integration of the approaches in teaching Science

The highest average weighted mean on the level of integration was obtained in active learning as rated by the Junior High School teachers with an adjectival description of always. This was followed by cooperative learning with 4.05 with an adjectival description of often. Collaborative learning had an average weighted mean of 3.79 and lastly, inquiry-based learning had a value of 3.75. The level of integration along the four (4) approaches had an over-all average of 3.96 with adjectival rating as often. The Senior High School teachers rated all the four (4) approaches with an adjectival description of often. The approach with the highest average weighted mean obtained in active learning with 4.06. This was followed by cooperative learning with 4.00. The next on the list was inquiry-based learning with 3.92 and lastly, collaborative learning with 3.82. The over-all average rating of the Senior High School teachers had a value of 3.95. In general, the level of appreciation of the integrative approaches as rated by the Junior High School and Senior High School teachers in Vinisitahan National High School is often as shown by the following results: active learning had an average of 4.16; cooperative learning of 4.03; inquiry-

based learning with 3.84; and collaborative learning with 3.81. The over-all average had a value of 3.96 with an adjectival description of often.

Test of significance on the difference of the level of integration of the approaches between the Junior and Senior High School teachers

Based from the Analysis of Variance in each of the integrative approach, the computed F values in the four (4) approaches revealed the following: in active learning, the F computed value was1.714; in collaborative learning (0.028); in cooperative learning, the value was 0.176 and in inquiry-based learning, the computed F value was 3.80. These values were lower than the F-tabular value at 0.05 level of significance with degrees of freedom 1 and 8 which was 5.318.

The challenges met in the use of integrative approaches

In active learning, the sum of ranks shows the following: lack of appropriate learning resources to provide varied activities with a sum of ranks of two (2) and final rank of 1st; excessive workload compared with traditional learning with a sum of ranks of four (4) and a final rank of 2nd; and students are reluctant to do different activities with six (6) with 3rd in rank.

The Junior and Senior High School teachers rated the challenges along collaborative approach with the sum of ranks as follows: individual differences among students with three (3) thus a final rank of first; lack of time provided for the process with a sum of ranks of 4 and final rank of second; and finally, lack of skills of students needed to collaborate with a sum of ranks of 4.5 and final rank of 3rd.

In cooperative learning, the sum of ranks shows the following: dependence on others for solutions with a sum of ranks of two (2) and final rank of 1st; diverse interest within groups with a sum of ranks of four (4) and a final rank of 2nd; and presence of in-groups conflicts and difficulty in management with six (6) with 3rd in rank.

In inquiry-based learning, the sum of ranks provides the following: lack of appropriate technology to implement inquiry-based learning with two (2) and a final rank of first; limited training of teachers on inquiry-based approach with four (4) and final rank of second; and hard to measure the quality of learning with six (6) and final rank of third.

Instructional materials to improve the use of integrative approaches

The researcher prepared a lesson plan using collaborative and inquiry-based approaches in the teaching of Science concepts. The selected topic dealt with plant cell included the teaching of Science for Grade 7 students. The lesson involved the part of the plant cell and integration of concepts to real world applications.

CONCLUSION AND RECOMMENDATIONS

The researcher concludes that there are many teachers in Vinisitahan National High School who utilize inquiry-based learning in integrating Science into their instruction. Both Junior and Senior High School teachers frequently employ collaborative learning, cooperative learning, and inquiry-based learning in their integration of Science. However, a notable difference exists in the use of active learning: while Junior High School teachers consistently implement it, Senior High

School teachers use it only often. Furthermore, the study reveals that there is no significant difference between the levels of integration employed by Junior and Senior High School teachers when it comes to active learning, collaborative learning, cooperative learning, and inquiry-based learning.

The study also identified the top challenges encountered in each of the integrative approaches. For active learning, the primary challenge is the lack of appropriate learning resources to support varied activities. In collaborative learning, individual differences among students pose a major challenge. For cooperative learning, students' dependence on others for solutions emerged as a key issue. Lastly, in inquiry-based learning, the lack of suitable technology needed for effective implementation was highlighted as a significant barrier. Based on these findings, the researcher concludes that developing instructional materials, particularly in the form of lesson plans, may help improve the use of integrative approaches in Science education.

Based on the findings, the researcher recommends that the teachers of Vinisitahan National High School be encouraged to further utilize collaborative learning in Science integration by participating in relevant trainings and seminars focused on integrative classroom strategies. It is also recommended that both Junior and Senior High School teachers organize Science fairs and group competitions to immerse students in projects that highlight scientific inquiry and teamwork.

To sustain and enhance the favorable use of integrative approaches, these strategies should be included in future in-service training programs within Vinisitahan National High School. Addressing the challenges identified in the study must be prioritized in order to elevate the frequency and quality of approach integration from "often" to "always." Lastly, the lesson plan developed by the researcher should be submitted to the Division Office of Albay for quality assurance. This step will help determine whether the instructional material aligns with established standards and educational objectives, thereby ensuring its effectiveness and applicability in Science teaching.

REFERENCES

Acero, V., E. Javier & H. Castro. (2000). Principles and strategies of teaching. Manila, Philippines: Rex Bookstore.

Ambrose, S. A., M. W. Bridges, M. DiPietro, M. C. Lovett, M. K. Norman & R. R. Mayer, (2010). How learning works: Seven research-based principles for smart teaching. San Francisco: Jossey-Bass.

Aquino, G. (1988). Principles and methods of effective teaching. Manila: National Book Store.

Bonwell, C. C. & J. A. Eison, (1991). Active learning: Creating excitement in the classroom. ASHE-ERIC Higher Education Report, Washington DC: School of Education and Human Development, George Washington University.

Broto, Antonio S. (2008). Statistics Made Simple. National Bookstore, Manila, Philippines.

Calderon, J, (1998). Principles and practice of teaching. Quezon City, Philippines: Great Books Trading.

Cervetti, G. N. & J. Barber. Text in hands-on Science, (2008). In E. H. Hiebert & M. Sailors, (Eds.) Finding the right texts: What works for beginning and struggling readers. New York: Guilford.

Corpus, B. & G. Salandanan, (2003). Principles and strategies of teaching. Quezon City, Philippines: Lorimar Publishing Co.

Frick, Theodore W. (2018). The Theory of Totally Integrated Education. Cham: Springer Nature Switzerland.

Gredler, G. R., M L. Hardman, C. J, Drew & B. Wolf. Human exceptionality. Boston: Allyn & Bacon, 2010.

Handelsman, J. & C. Pfund, (2021). Scientific teaching. New York: W.H. Freeman.

Handelsman, J., S. Miller, & C. Pfund, (2007). Scientific teaching. New York: W.H. Freeman.

Hurlock, Elizabeth B. (1980). Developmental psychology: A life-span approach. USA: McGraw-Hill.

Inocian, R. Fundamentals of teaching, 1st Edition. Mobolo, Cebu City, Philippines: Optima Typographics, 2010.

Kunwar, D. S. & S. M. Nyandemo, (2004). Aspects of project planning, monitoring evaluation and implementation. Dehra Dun: India Shiva Offset Press, 2004.

Laguador, J, (2004). Cooperative learning approach in an outcome-based environment. International Journal of Social Science Arts and Humanities, Vol. 2, No. 2.

Padilla, M. J., K. D. Muth, R. K Padilla Lund, (2001). Science and reading: Many process skills in common. In C. M. Santa & D. E. Alvermann (Eds.). Science learning-Processes and applications. Newark, DE: International Reading Association.

Paler-Calmorin, Laurentina & Melchor Calmorin (2002). Methods of Research and Thesis Writing, Quezon City: Rex Printing Company, Inc.

Sanchez, Custodiosa Acheta Ph.D., (1998). Methods and techniques of research, Third edition. Quezon City: Rex Printing Company, Inc.

Schmidt, R. & Y. Watanabe. (2001). Motivation, strategy use and pedagogical preferences in foreign language learning. In Z. Dornyei & R. Schmidt (Eds), Motivation and second language acquisition, Honolulu: University of Hawaii, Second Language Teaching and Curriculum Center.

Siegel, Sidney, et al. (1998). Non-parametric Statistics for behavioral sciences, New York, McGraw-Hill Company.

Vizcarra, Florante O. (2003). Introduction to educational research, Quezon City: Great Books Trading.