

Answer-Giving Strategy: An Effective Way in Dealing with Mathematical Problem

John Wilson A. Brucal, Joan C. Perez, Ivy Enoslay and Donna C. Liwanag

Our Lady of Caysasay Academy, Marvelous Faith Academy, Stonepro Trading Corp.
E-mail: wilbrucal@gmail.com; peresjoan@yahoo.com; ivee0219@yahoo.com;
wilde070188@gmail.com

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Abstract: In an attempt to help the students in dealing with mathematical problem, researchers, combined efforts to conduct an action research to 7th grade junior high school students. Student's struggles with word problem are considered as the gap and the researcher aimed to give possible solutions on it. The study was conducted to help the students to develop their skills and confidence and improve their ideas toward mathematical concepts. Thus, it paved way to investigate how answer-giving strategy can be an effective way in dealing with mathematical problem both in behavioral and logical aspect of the students and how this can affect their overall performance. Based on the findings, it was observed during the class discussions that the more the teachers train the students to work hard in getting the designed output of a problem, the more the teachers could get a very few correct answers from them. Moreover, the study concluded that students find it easy to solve problems with given cue answers. In addition, students read not only once but many times before they solve because they must understand the problem in order for them to apply the concepts. Furthermore, it was recommended that dealing with problem solving, students must understand first what the problem is all about and they should know how to decode word problems into mathematical sentences.

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Introduction

For decades, teachers have been training students to focus on getting the answer, from our mere classroom up to different well-known quiz bees; this is the reason why many students race through getting the desired output. Phil Daro, one of the writers of Common Core State Standards in the US, stated, "Are you teaching mathematics or answer-getting strategy?" A very brief and meaningful question that gives chills to our in-depth self-realization. As we look on our students having this thought in mind. We've come to question ourselves, "Are we taking the right track? or Are the efforts we inserted in teaching are not enough?", since we can see the frowning faces of the students whenever we say problem solving. During our class in Advanced Calculus, our professor often gave us tasks or seatwork after the lesson which is really exhausting. But at the same time we also look forward to it. Why? It is

because he also gives the final answer as written in the reference book. By that, we are challenged to answer the given tasks.

Answer-giving strategy is a guided discovery approach, which fundamentally linked with the constructivist school of education theory. It is allowing the children or student to find the answer themselves by guiding them on their goal. It is a way of engaging students to consider mathematics as an enjoyable one and not be afraid on quizzes that the teacher will give to them. Moreover, answer giving strategy can promote critical thinking among the students.

According to Anderson (2011) also cited Richard Paul (nd) that, “Critical thinking is not just thinking but thinking which entails self-improvement.” And self-improvement works hand-in-hand with determination as every students need to develop such attitude in order to succeed.

According to Republic Act No. 10533, AN ACT ENHANCING THE PHILIPPINE BASIC EDUCATION SYSTEM BY STRENGTHENING ITS CURRICULUM AND INCREASING THE NUMBER OF YEARS FOR BASIC EDUCATION, APPROPRIATING FUNDS THEREFOR AND FOR OTHER PURPOSES, it stated that:

...every graduate of basic education shall be an empowered individual who has learned, through a program that is rooted on sound educational principles and geared towards excellence, the foundations for learning throughout life, the competence to engage in work and be productive, the ability to coexist in fruitful harmony with local and global communities, the capability to engage in autonomous, creative, and critical thinking, and the capacity and willingness to transform others and one's self.

It can be gleaned that promoting critical thinking among the students is one of the things that the present educational system of Philippines wants to emphasize. It is for the aim of achieving excellence since critical thinking is one of the competencies required by the 21st century generation.

Mathematics teaching is one of the ways to promote critical thinking among students. However, it is very hard on the part of the teachers to let the students realize the importance of mathematics in their life. In addition, according to Magayon and Tan (2016), relating real-life situation to the lesson, modified learning activities, learning activities according to students' preference, teachers' assistance during learning activities, and grouping students into smaller units could be the ways to engage students in mathematics. In relation to this, it would be easier for the students to understand and comprehend the concepts in mathematics. Moreover, such things can be the way to promote critical thinking among the students.

In connection with this, the researchers aimed to determine how the strategy used by the teacher helped the students to easily answer the problem given to them. More so, to identify the technique which is preferred by the students in answering the problem to achieve critical thinking is likewise considered by the researchers.

Related Literature

Over the past few years, Philippine Education has been struggling on how to improve the performance of Filipino students in classroom, specifically in Mathematics. In addition, we've trained students to focus in getting the correct answers they tend to believe it is the main goal of every word problem. Phil Daro stated that, “Correct answers are essential but

they're part of the process, they're not the product. The product is the math the kids walk away with in their heads."

In the new breed of millennial students, industrialization and modernization drastically took place. Students' determination slowly decline due to fast paced society. Critical thinking became a blurred vision in every student's eyes. Thus, it is difficult for students to answer simple problem solving. Tambychik and Meerah (2010) cited o their study that according to Mohd-Nizam Ali and Rosaznisham Desa (2004), "Many Mathematics skills were involved in problem-solving. However, large numbers of students have not acquired the basic skills they need in Mathematics." Furthermore, it is important that the students should learn the basic concept of Mathematics because according to Garnett (1998) and Nathan (*et al.*, 2002), "Incomplete mastery of number facts, weakness in computational, inability to connect conceptual aspects of math, inefficiency to transfer knowledge, difficulty to make meaningful connection among info, incomplete understanding of mathematical language and difficulty in comprehend and visualizing mathematical concept ought result in difficulties."

Methodology

The study is a descriptive experimental and made use of both quantitative and qualitative methods. Data collected were used primarily to describe students' strategies of problem solving. The participants consist of 30 grade 7 students in an intact class in a private sectarian school in Batangas. A teacher made test was used as a tool. The instrument used was a 15 item test that assessed students' conceptual understanding and procedural skills on problem solving about integers. Similarly another questionnaire was given to know students strategies in solving word problems. Item numbers 1 to 5 always, sometimes and never test is use to know the problem solving strategies of the students. The teacher made test is composed of Set A without given answers and Set B with answers, both for problem solving about integers. A one-hour interview was conducted to 15 randomly selected students to verify their answers. Names are optional for confidentiality. Permission to conduct the study from the school's administration was secured.

Results and Discussions

Phase 1

The first phase of this study focused on the students' way of analyzing given mathematical problem, with the intent to determine on how often they read a question before proceeding to show their solutions. Table 1 displays the results.

Table 1. Survey Question on Students Feedback

| Question # | Never | Sometimes | Always | Total |
|------------|-------|-----------|--------|-------|
| 1 | 0 | 14 | 16 | 30 |
| 2 | 0 | 16 | 14 | 30 |
| 3 | 2 | 7 | 21 | 30 |
| 4 | 0 | 15 | 15 | 30 |
| 5 | 7 | 21 | 2 | 30 |
| 6 | 0 | 16 | 14 | 30 |

Based on the table presented, 16 out of 30 students answered ALWAYS for them to really understand the problem, they need to read it not only once but many times. This is because certain skills like comprehension skills are needed to decode what the problem is all about. Ghazali and Zakaria (2011) mentioned in their study the idea given by Rille-Johnson *et al.*, (2001) that conceptual mathematics understanding as knowledge, involves thorough

understanding of underlying and foundational concepts behind the algorithms performed in mathematics.

In addition to that, no one answered never when they are being asked if they reviewed their process and their understanding regarding the problem being asked. This means that they are more conscious now if what they have done made sense to the problem. Similarly after thorough review, 21 students claimed that they are reviewing the solutions and this is a good manifestation of students' eagerness to answer it correctly. It is also interesting to know the reasons of the 2 students who are not reviewing the answers. Upon the interviewed made to the 2 students who never reviewed their works, both of them mentioned that they tend to commit errors if they will review it. They believed in their instincts.

Questions 4 and 5, deal with the questions of showing the exact solution and answer. For showing the exact solution, those 15 who answered Always are very confident that they've made it. But other half are somehow confuse if they made it right. While for question 5, 21 out of 30 respondents shaded Sometimes for showing the correct answer.

Students are asked if they asked for help, and 14 of them said ALWAYS not because they do not know what to do rather they want to make sure if what they are doing are correct. They usually asked for help to their classmates and teacher.

Table 2. Scores of the 30 Grade 7 students who took 2 sets of Tests

| Student | Students Score (w/o cue answer) | Students Score (w/ cue answer) |
|---------|------------------------------------|-----------------------------------|
| 1 | 10 | 13 |
| 2 | 7 | 6 |
| 3 | 3 | 14 |
| 4 | 6 | 12 |
| 5 | 9 | 15 |
| 6 | 5 | 8 |
| 7 | 3 | 6 |
| 8 | 7 | 5 |
| 9 | 10 | 14 |
| 10 | 12 | 15 |
| 11 | 9 | 12 |
| 12 | 7 | 4 |
| 13 | 2 | 5 |
| 14 | 2 | 8 |
| 15 | 11 | 14 |
| 16 | 1 | 15 |
| 17 | 15 | 15 |
| 18 | 11 | 15 |
| 19 | 13 | 14 |
| 20 | 9 | 15 |
| 21 | 12 | 15 |
| 22 | 11 | 15 |
| 23 | 10 | 13 |
| 24 | 12 | 15 |
| 25 | 10 | 15 |

| | | |
|----|----|----|
| 26 | 11 | 15 |
| 27 | 9 | 15 |
| 28 | 10 | 15 |
| 29 | 9 | 14 |
| 30 | 11 | 15 |

Looking at the table, the second column is their attempt to solve problems without given cue answers, the average score is 9. It is quite okay, but need to be attended. While in column 3, most of the students got above 10 which is really a good manifestation of learning. Another interview was conducted to find the reasons why their scores are different from the fact that same tests were given. They shared that the answers given in test 2 really helped them understand the problem. They are eager to show the solution for that answer. Another sharing was made, it's because they are directed already to the answer so what they need to do is to find out how they can come up with that particular answer.

Conclusions

Based on the findings, word problem solving is one of the important elements of mathematical problem solving which incorporate real applicants. In this regard, the study concludes that students find it easy to solve problems with given cue answers. A more positive attitudes were being observed because they are determined, deliberate and work in collaboration as they answer the given problems most specifically integers. They keep on looking at the answers until they're confident in their solutions.

Moreover, students read not only once but many times before they solve because they must understand the problem in order for them to apply the concepts. This is also true because even after solving the problems they are going to review again and again just to make sure their answers are correct. In addition, students need to have a directed goal in order for them to come-up with the correct solutions. The researchers proved that giving the correct answers in mathematical problems is an effective way for the students not to hate Mathematics. This method could help students to be motivated and determined to improve their mathematical skills.

Recommendations

Based on the aforementioned conclusions, the following recommendations are address not only to the teachers but most especially to their students. In dealing with problem solving, students must understand first what the problem is all about. They must know how to decode word problems into mathematical sentences. In-depth understanding of mathematical concept and positive behavior, teachers must develop not only the critical thinking but sought after how to build students determination and confidence.

References

1. Anderson, M. 2011. Ladies, Front & Center! Elevate Humanity Through Self Discovery. See It Through Publishing.
2. Garnett, K.G. 1998. Maths Learning Disabilities. Journal of CEC. Retrieved on 3rd Feb 2009 from http://www.idonline.org/ld_indepth/math_skill/garnet.html.
3. Ghazali, N.H.C. and Zakaria, E. 2011. Students' Procedural and Conceptual Understanding of Mathematics. Australian Journal of Basic and Applied Sciences, 5(7): 684-691.

4. Magayon, V.C. and Tan, E.B. 2016. Learning Mathematics and Differentiated Instruction in the Philippines: A Phenomenographical Study on Struggles and Successes of Grade 7 Students. *International Journal of Educational Studies in Mathematics*, 3(3): 1-14.
5. Mohd Nizam Ali and Rosaznisham Desa. 2004. Meningkatkan Kemahiran Mengingat Sifir 3,6 dan 9 di Kalangan Murid Pemulihan Tahap 2. *Jurnal Kajian Tindakan Pelajar PSPK*. Kementerian Pendidikan Malaysi, 102 – 112.
6. Nathan, V., Sarah, L., Adam, L. and Nathan, S. 2002. Difficulties with Maths: What can stand in the way of a students' mathematical development. *Misunderstood Minds*. retrieved on 4th Sept 2009 from http://www.misunderstoodmind/math_skill.
7. Rittle-Johnson, B., Siegler, R.S. and Alibali, M.W. 2001. Developing conceptual understanding and procedural skill in mathematics: An iterative process. *Journal of Educational Psychology*, 93(2); 346.
8. Tambychik, T. and Meerah, T.S.M. 2010. Students' difficulties in mathematics problem-solving: What do they say?. *Procedia-Social and Behavioral Sciences*, 8: 142-151.