Hitting Two Birds with One Stone: A Phenomenological Inquiry of Junior High Math Buddies in a University

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Abstract

To provide adequate academic support services in the area of Mathematics, a peer tutoring program called Math Buddy was initiated and studied using phenomenology to capture the life experiences of the tutors and tutees who were purposively selected Grade 9 students in Mathematics. The descriptive analysis of the students' weekly journals, written evaluations, observations, and focused group discussions had revealed the following themes: (1) challenging initial implementation; (2) embracing social responsibility; (3) understanding varying personalities; (4) recognizing benefits and incentives; (5) developing creativity and initiative. The students recognized that there were benefits and incentives derived from their participation in the program. They also admitted that it was a challenging task that developed their creativity and initiative because they have to understand varying personalities as they embrace their social responsibility. As the benefits outweigh the challenges, the researchers recommend that the program be continued.

Keywords: Mathematics, Peer tutoring, Math Buddy Program

Introduction

The embryonic concern on the Mathematics performance of the Filipino students is inevitable. Even the change in curriculum has not led to any significant improvement. According to results of the 2003 Trends in International Mathematics and Science Study (TIMSS), Filipino students are still weak in Math and Science. Based on the report done by the National Center for Education and Statistics, when TIMSS was first conducted in 1995 among 42 countries, the Philippines were placed in the 41st rank in science and

30th rank in Mathematics. In 2008, Philippines performed very low by placing the country in the 34th rank out of 38 countries in Secondary II Mathematics and 43rd rank out of 46 countries in Secondary II Science. For elementary level, such as in grade 4, the country performed 23rd out of 25 participating countries in both Math and Science. This means that Philippines consistently ranked low in international evaluations on mathematics competence.

These findings mirror the minute trepidation on Mathematics performance in local scenarios. Each school is tasked to find ways on how to revitalize students' performance in Mathematics. As stated by Alexander (2004), there are many ways to address the need for academic support for students and the option for tutorial learning can potentially address this. Hence, the University of San Carlos - South Campus has put in place, on an experimental basis, a Math Tutorial Program which implements a peer tutoring format. In general, it sought to improve the Mathematics performance of academic probationary students (tutees) with the help of students from the honors class (tutors).

The Math Buddy Program aims to provide a non-threatening environment for tutees to acquire mathematical skills in order to uplift their status as academic probationary students in Mathematics. Moreover, the program aims to: (1)inculcate the values of social responsibility, humility, and intellectual integrity in response to the school's mission-vision; (2) provide avenues for student's to master their mathematics proficiency through teaching peers; (3) encourage students' creativity and critical thinking by making their own worksheets as springboard for enrichment(high performing students) and remedial (low performing students) programs; (4) improve numeracy skills and enhance self-esteem and self-confidence; and (5) promote camaraderie through bonding with peers.

A person who has achieved proficiency in learning desired content or skill can assist another person who is yet to achieve such level of proficiency in a partnership such as peer tutoring (Topping, 1996). In addition, Gartner and Riessman (1993) found that tutorials in its varied forms catered for more than just the aim of achieving an accurate answer. Recipients of tutorials are exposed to a greater variety of learning strategies, and the process of tutoring aids in learning which in turn translates to the creation of connection between learning cognitively and developing socially. Alexander (2004) states that individual achievement is fostered by not only his or her efforts to learn but also by the support he or she receives from his or her environment.

In the past, tutorials played a significant role in student's learning and education process. It even occupied an essential part in the teaching-learning process (Zaritsky,1989). However, due to the current changes and trends in the educational and technological world, there is now a deep emphasis on the need of academic supports services such as peer tutoring (Civikly-Powell,

1999). According to McGrath and Townsend (1997), these academic support services provided for students permits them to regulate and do everything to the best of their capabilities. Normally, the individual student has the sole responsibility to distinguish his or her academic needs and should pursue for assistance from the most suitable source(s).

Furthermore, changes in the student population also affected the academic performances of students. Hence, this resulted in the exploration for proper academic support systems in organizations (Heckman, 1993). It has been reported that the Philippines have the worst pupil-teacher ratio in Asia at 45:1 (Flores, 2006). The DepEd's Basic Education Information System also shows an imbalance in the distribution of teachers. While some schools have less than 40;1 ratio, many schools have more than 40 students per teacher. Furthermore, one way to attain quality education despite this problem is to increase support services particularly academic support services through collaborative learning.

In order to address this gap, the Math Buddy Program has been designed to cater for these concerns.

Objectives of the Study

This paper focuses on exploring the life experiences of Junior high school students (grade nine) who engaged themselves in the Math Buddy Program. It is a tutorial activity specially given to the top 30 performing students being paired to the academic probationary students in Mathematics in the school year 2013-2014. Specifically, this phenomenological study aimed at capturing the life experiences of the tutors and tutees such as (1) positive and negative experiences; (2) their challenges during the implementation of the program; and (3) the coping mechanisms of the informants.

Limitations of the Study

This study was limited to the Grade 9 Junior high school students of the University of San Carlos, Basic Education Department South Campus. The two groups being studied were identified as low and high performing students. The 30 low performing groups, which were considered the Math Buddy Tutees (MB-Tutees), were composed of academic probationary students who got a grade of 76 and below in the final quarter. Thus, they were recommended for intervention programs to uplift their academic status. On the other hand, the 30 high performing groups which were considered the Math Buddy-Tutors (MB-Tutors) were from the *cream* class with a Math grade of not lower than 80 and a general average of 85 and above. These groups were purposively being chosen as samples of the study. This is because they belong to the upper 30 and lower 30 in the total population of the Grade 9 Junior High School

students as identified by the School registrar and the Grade Level Coordinators in the previous level.

Materials and Methods

This study utilized the qualitative research method, specifically the phenomenological design. It sought to capture the informants' life experiences (Polkinghorne, 1989). Personal interviews were done after every session or anytime the need arises. There were times that students would approach the teacher-researcher to tell them their story on what happened during their sessions. They would tell their difficulties and ask for help from the teacher on how to solve their problem. Audiotapes were used to record some buddy sessions. Observations were also noted using field notes. Weekly journals were written on the last day of the week so they can be able to express and share their experiences, insights, or difficulties. These journals were then read by the teacher and then sharing of feedback follows. Focus Group Discussions (FGD) were also conducted by the researchers. After data gathering, interpretive analysis was done to answer the questions posed by this study. The researchers then employed the triangulation method to validate the results which involved the tutee, tutors, and the researchers.

Participants

The participants were purposively chosen and were labelled as high and low performing group. The high performing group were the students who have a Math grade of at least 80 and have a general average of at least 85. They served as MB-tutors while the MB-Tutees were the low performing group who were considered the academic probationary students in Mathematics with a Math grade of 76 and below. The latter underwent intervention programs such as bridge (if they got a grade of 75 & 76), completion (if they got a grade of 74) and summer classes (if they got a grade of 70-73).

Table 1. *The population of the study*

Grade 9	**f**	**%**
Tutors	30	50
Tutees	30	50
Total	60	100

Procedure

Firstly, the conduct of the Math Buddy Tutorial activity and this research was done by informing the school regarding the study to be conducted. This was followed by identification of the format to be used, selection of the tutoring pairs, preparation of tutors' skills through training, and arrangement of the entire environment.

The study started with sending an informed letter of consent to the administration stating the objectives and the significance of conducting a math buddy tutorial activity by following a cross-age tutoring format. The school was also informed regarding the plan of providing an additional academic support service in addition to the remedial program and other intervention programs of the school.

In Grade 9, one class is grouped homogenously being the honors class. This was the class selected to be the tutors. This class, considered as the high performing group, was informed regarding the Math Buddy program as part of their enrichment activity. Enrichment activities comprised of 30% in the component of their grades together with seatwork, projects, and assignments. In choosing their partners, they can be paired by the teacher randomly based on their skill levels (Kohler & Greenwood, 1990). On the other hand, special attention to behavioral or achievement problems might be another thing to consider in the grouping strategy (Cooke, Shonnard & Wood, 1983). In this study, random sampling through a fishbowl technique was used in identifying the MB-Tutees. They are the low performing group who were classified as academic probationary students at the start of the school year due to their failing grades in the previous year.

The tutors were trained every Friday through advance lessons. The first 30 minutes of their Friday schedule was spent in answering and defending a Math Olympiad question, and the rest of the hour was spent in creating the worksheet intended for their Math Buddy. These worksheets were checked by the teacher-researcher for validity before it will be administered the following week. Monitoring the two (2) sessions in a week was done and attendance was also checked. At the end of their Math Buddy sessions, students were told to fill up the MB monitoring sheets, attendance sheets, and progress charts. The environment was arranged in such a way that the students would find it convenient on their part. They were required to do 2 sessions in a week (every Tuesdays and Wednesdays) with at least 1 hour per week. If they ever failed to conduct the session, Thursday and Friday were set for an extension session. Post-test was given every Monday at dismissal time for the low performing group. Checking and recording were done by the high performing group. Giving feedback followed after this procedure through writing their journal at the entry of the week and filling up progress charts.

Then, the researchers gathered all the data. Data were analysed and themes were extracted. These were reported in the results and discussions.

Results and Discussions

A descriptive analysis of transcripts revealed that five major themes characterized the Math Buddy Program experiences of the tutors and tutees involved. Each of the five major themes was labeled by an emergent concept

based on the formulated meanings gathered from significant statements. This was taken from the students' journals, written evaluations, and the focus group discussions done by the researchers. These five concepts are not to be taken separately, but it can be understood as interrelated aspects of a single experience shared by different students. The five themes, as derived from the present set of transcripts, are as follows:

1. Challenging initial implementation
   (We have to adopt and adapt)
2. Embracing social responsibility
   (We do our part for this to work because we share what we have)
3. Understanding varying personalities
   (We have to deal with their different attitudes)
4. Recognizing benefits and incentives
   (We get something out of the Math Buddy Program)
5. Developing creativity and initiative
   (We are going beyond our comfort zones)

Theme 1. Challenging Initial Implementation: *We have to adopt and adapt*

All the tutors and tutees have reported efforts on their part to cooperate on the implementation of the Math Buddy Program. On the first meeting, the following journal entry revealed those who have welcomed the program on a positive note:

> *"My first session with my math buddy was a bit tense. I didn't know how to start a conversation. I just let him answer the questions I prepared and observed him. It's good to know that he is eager to know and learn… Our session was quite a success and I hope this will continue."(h4;Journal Entry#1)July 12, 2013*

Nevertheless, there are those who saw it on the contrary:

> *"I only have little experience with my math buddy because he was very lazy. I have to approach him every time to tell him to go to our classroom but despite my repeated invitations, he will just say 'later' (bisag kapila nako gi-adto, muingon ra siya nga 'unya na'). I didn't get the chance to teach him. I get so frustrated because he doesn't listen to what I say." (h5;JE#1;July 12, 2013).*

Since it is not considered as an official part of the academic support services of the university and is still on its initial implementation stage, the students shared that they have to exert effort to accommodate the said initiative in their lives as students. This is evidenced by the following excerpts from the students' written evaluations:

> *"It conflicts with daily routine"*
> *"It adds to our tasks and source of pressure"*

"Teachers forget that we are still students and yet they have high expectations on us"

"I have to find time for the program."

Students' reports on their journals and written evaluations reveal the two main problems in the initial implementation. One source of challenge has something to do with time allocation:

> *"She's very difficult to find since she likes to wander around along with her friends during break and lunch times so we only got to meet during dismissal, not to mention that I have a hectic schedule every day."(h25;JE#1;July 12, 2013)*

On top of this, some students complain about the venue of the tutorial session as evidenced by the following journal entry:

> *"If she won't go to my room, I have to walk a long way from my classroom to her room not to mention our schedules don't exactly meet."(H27;JE#1;July 12, 2013)*

In the desire of the Math Buddy Program to provide avenues for students to master their mathematics proficiency through teaching peers, problems revolve around scheduling and the venue of the tutorial session which was expounded on in the focus group interviews where students exclaimed:

> *"We always have to adjust to meet the schedule." (Ang schedule ba kay magsige mig apas.) (h3 interview Sept 14, 2013)*
>
> *"The venue, SCB, is very far." (Didto ba sa SCB. Layo kaayo). (h3 interview Sept 14, 2013)*

All of these reports reveal that change is always a challenge to everyone involved. For all those who take part in the program, adjustments have to be made. As high school students, they take part in activities that are not only academic in nature but also co-curricular and extra-curricular. The Math Buddy Program is seen as an addition to all of these. Given that it is done during their free time, it competes not only with the demands of school work but also in the students' social life.

The researchers found out that despite all these challenges, the students have adopted the program and have adapted in order for it to work. This leads to the second theme.

Theme 2. Embracing Social Responsibility: *We do our part for this to work because we share what we have*

After collection and analysis, data revealed that students have an understanding of why the Math Buddy Program is implemented and have shown an understanding of the concept of social responsibility. Portions lifted from the questionnaire answers are as follows:

> *"We are applying what our vision statement says, "what we have, we share""*

"Not only we study for ourselves, but we also have to study for other people"

Since they share in the vision and mission of the program, they try to play their roles and try to play them well. This is supported by the following:

"I tried waiting. I tried going to her classroom but she is not there. She's somewhere I don't know where. Like, my patience is going little by little. But I don't want to get mad because she is my tutee after all. How can you teach when you are angry or like that? You can't teach properly. And I love teaching and I want to be a teacher so it is also like a training for me. But how can I when my student or tutee is not committed or won't accept that I will teach her." (h3 interview Sept 14, 2013)

It is also important to note that the tutors are interested in the learning of their tutees. More than viewing it as a requirement, they take it as a personal goal to make their tutees learn and they feel they are responsible when their tutees do not achieve the expected results as evidenced by these statements:

I will discuss and then I will ask, did you understand? (Kasabot ra ka ana?). And then she said Yes, I understand but when we get to the (O, kasabot ra ko pero inig abot sa) post-test maybe she will have just a passing grade or below the passing grade. So I'm like maybe I did something wrong or maybe I taught her wrong. (h3 interview Sept 14, 2013)

"We had a shortage of time and I didn't have the chance to teach him all my techniques, but then I realize something. He doesn't get it at all! He is somewhat like a slow learner but still I believe that he can do it with my help – we can do it! I'm gonna make him someone who is smart. I'll change him!"(1)July 12, 2013

If they get big scores, it's okay but if their scores are low, huhuhu. If they get low scores, it's a sad thing. (If daku, okay ra. If gamay kay huuhuhu. If gamay kay ka-sad ba.)(h3 interview Sept 14, 2013)

More than just their cognitive development, there are also tutors who aim to develop the whole person of their tutees as supported in the following:

"I hope I can teach her Math and at the same time to be responsible too."(H8;Journal Entry#1;July 12, 2013)

This reflects the achievement of one of the objectives of the Math Buddy Program, which is to inculcate the values of social responsibility, humility, and intellectual integrity in response to the school's mission-vision. However, if there are those who embrace each other's differences, that means that there are also cases where personalities differ and they clash. This leads the discussion of the third theme

Theme 3. Understanding Varying Personalities: ***We have to deal with their different attitudes***

Frustrations from both ends (tutors and tutees) are also linked to varying attitudes of the students involved in the program. During the interview, when the students were asked whether they feel that their personalities are not compatible with that of their Math Buddy, one student exclaimed: *I think so, Maam! (Sus Ma'am, murag)! (h3 interview Sept 14, 2013).*

The tutors and tutees perceptions on how their student counterpart views the Math Buddy Program also vary in the positive and negative side of the spectrum. Two students revealed it in these reports:

> *Maybe they don't really like the Math Buddy Program. Because the first day when I came to her when we drew lots, I went to her classroom and I have a friend in that classroom and then I asked her who is… and I mentioned the name and she called her and I told her that we have this Math Buddy Program and I am assigned to you and I hope that we could be friends and we have to have sessions in a week and then she said, is it really needed? I'm really very busy. (Kailangan pa jud diay na? Busy bitaw kaayo ko…?) And I was like I don't know but we really need to have this like that, like that. I told her that I hope she could come on this day for our session. Thankfully, she came and we did our first session. But it was like rejection when she said is it really needed? (Kailangan pa jud diay na?). (h3 interview Sept 14, 2013)*
>
> *"She said that she's gonna try harder now because she's now part of the soccer team this Intramurals. If she fails in Math this time around, she'll gonna be kicked out of the team. She is more motivated now. Getting better, at least."(h27;JE#2;July 19, 2013)*

The variety of student attitudes towards how they perceive the program can also be supported by the following evaluation entries:

> *"It is tiring and stressful."*
>
> *"I am busy."*
>
> *"It is annoying."*
>
> *"I might not teach the right thing."*
>
> *"Lack of interest on the part of the tutees…and lack of respect, cooperation and sensitivity."*
>
> *"Some tutors are not patient."*

The students highlight this as one of the main challenges of the program although there are also reports where their tutees are compatible with each other:

> *"My experience for the session 1 & 2 of Math Buddy was fine. I was lucky to have a Math Buddy who is willing to learn and he is the*

one who will directly go in the classroom without being told."(h2;Journal entry#1July 12, 2013);

"I really appreciate it when she went to my room just to inform me that she can't have a session in order for me not to wait for her. She's a considerate Math Buddy."(h8;Journal Entry#3;July 29, 2013)

Furthermore, there are also cases where the relationships did not start well at first but have improved later on:

"It was great with my math Buddy because it was not awkward anymore. We were laughing and talking like we're great friends. Now, he is really open and tells me if he finds this item difficult."(h30;JE#5)

Through these reports, the researchers can also opine that the Math Buddy Program promotes camaraderie through bonding with peers. In addition, through these reports of new friendships formed among students, the fourth theme has now emerged.

Theme 4. Recognizing Benefits and Incentives: *We get something out of the Math Buddy Program*

The tutors and tutees both reported that they are receiving something good out of the Math Buddy Program despite its many challenges. These lines were taken from the written evaluations:

"Enriching for both me and my math buddy…I am helping him with whatever he doesn't understand and I get to learn sometimes, too"

"Help me increase my grades in Math"

"It gives us the push we need to master each lesson in Math so that we can teach the right thing instead of fooling ourselves teaching the wrong thing."

"Help me become a better individual"

These incentives can generally be classified into two. The first is improvement in their Math performance. The tutees learn from their tutors and the tutors also learn more as they teach:

"I really do hope that he understood and learned something from me. It was fun teaching him because when I teach, I can learn more about the lesson."(H32;JE#1;July 12, 2013)

"I guess it was worth it because I also had a review as well. I learned the value of time too."(h30;JE#6)

The second is that the participants recognize that they grow:

"I really admire her for being so determined to learn and to understand Geometry. She went to our classroom and thanked me again and again." (h2;JE#3;July 29, 2013)

"Despite my busy schedule and being part of the star section with lots of works to do, I still find a feeling of charity in doing this

activity for I was able to help my fellow schoolmate in his subject." (h23;JE#1;July 12, 2013)

These findings highlight how the Math Buddy Program has improved the numeracy skills, and it has also enhanced the self-esteem and self-confidence of the students. These cannot be sweeping statements because those who have participated in this initiative have seen growth in certain areas of their development. Development means that the students have grown from where they were which leads to the last theme identified in this study.

Theme 5. Developing Creativity and Initiative: *We are going beyond our comfort zones*

The Math Buddy program encourages student's creativity and critical thinking by making their own worksheets as a springboard for enrichment (high performing students) and remedial (low performing students). Critical thinking is covered by the previous themes as well. However, the highlight of this theme is the recognition of student's decision to be proactive rather than reactive to the Math Buddy Program.

The following answers to the written evaluation highlight how this program has helped them to go beyond their comfort zone:

"It's nice because we can interact with other people around us."

"It is a new experience for all of us."

"We are forced to study to understand the lesson."

"I really tried my best to fully understand the lessons by scanning books, asking help from my classmates and even through the net."

These statements reflect how they recognize that this program has paved the way in meeting new people. For the tutees, initiative means going to the classrooms of their tutors and this happens for the tutors as well. The students from the honors class exert more effort as they study the lessons to gain more understanding so that they may accurately teach the lesson. There are even those who go beyond the required number of sessions when the need presents itself. These are duly supported from the following interview excerpts:

"I eat my lunch fast."(Magdali ug kaon ug lunch.) (h3 interview Sept 14, 2013)

"Sometimes, they (tutors) don't really understand so they ask their smartest classmate." (Panagsakay di pod sila kasabot, mangutana pa sila sa ilang kinabraytan.) (h3 interview Sept 14, 2013)

These excerpts highlight how tutees also do what they can to accommodate their tutorial sessions even if it means eating their meals fast. The tutees also recognize that when their tutors find a particular lesson challenging, the tutors

also look for a way to fill the gap. On the part of the tutors, they also think of ways to improve on their "teaching".

In the journal entries, these experiences can also be lifted to support this theme:

> *"Our last session was quite fun. We had a little game and I am happy that he cooperated. And I am thankful that he is willing to do sessions with me and doesn't complain about things. He just answered the worksheet and whenever he doesn't know the answer or understand the problem, he asks. It's great to know that he is progressing. (h4; JE#5) August 15, 2013)*
>
> *"I told her some funny clues to understand and remember key words and formulas for the test. I realize that people that are neither kinesthetic nor visual learners learn a lot through mnemonics. I might also teach others in a simpler and fun way lie what I did to my math buddy." (h18; JE#6; Aug.22,2013)*

Conclusion

After careful analyses of the journals, written evaluations and transcriptions of the focus group interviews, the essence of the students' experiences of the Math Buddy Program might be read as follows:

> *The students believe that there are benefits and incentives derived from their participation in the program but they also admit that it is a challenging task that developed their creativity and initiative because they have to understand varying personalities as they embrace their social responsibility.*

The participants reported positive and negative experiences related to the tutorial activity. They have received something out of the program in the form of an increase in their Mathematics performance and in their personal growth as well. However, they recognize that the program is demanding much from them. Their coping mechanisms are tested because they are asked to move out their normal routines and schedules as students. This is considered as an addition to their already mounting tasks as students. The challenge is not only limited to the adjustments they make to the program per se, but they also adjust to each other's varying personalities. Over all, all the participants see the link of the Math Buddy Program based on the mission of the school which is to share what they have been given.

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