

Reflective teaching approach: Immersing students in the value of learning

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Abstract

As reflective teaching approach is one of the five approaches being promoted to be used for 21st century learners, alongside collaborative, constructivism, integrative and inquiry-based, it turns out that this approach is the least used, explored and studied. Learners nowadays are not into the habit of reflecting on their ways, their words and actions – they just want to hear from others and be elated on what others would say to them. This study focused on the investigation of the reflective teaching approach implemented in distance learning through the closure part of the teacher-made, QR-coded brochure being distributed as supplemental materials to learners, and the writing on the reflective journal as learners debrief themselves on the topic of the lesson in General Mathematics and Statistics & Probability. Thirty-two ABM learners during the school year 2020-2021 had their Mathematics performance without using reflective approach compared to the Mathematics performance of thirty-four ABM learners of school year 2021-2022, using reflective approach. Using t-test for independent sample means, it was found out that there is a significant difference in their performance, in that, learners perform better when reflective teaching approach was used. Online survey was administered to the 34 ABM learners who were exposed to reflective teaching approach and they rated the ethic of caring aspect of the approach as very highly satisfactory, ownership of learning as very highly satisfactory, practical sense as highly satisfactory, looking into cause or reasons as very highly satisfactory, and the self-checking aspect of the reflective approach as very highly satisfactory. Included in the online survey is the open-ended question which deals with the benefits of reflective teaching approach, and the theme generated from the responses is this: “Reflective teaching helps students understand better as it fosters view of real life, seeking reasons for learning and gaining knowledge that leads to professional growth in future.” Recommendations were laid down for Mathematics teachers, Department of Education officials and curriculum developer.

Keywords: reflective; self-checking; knowledge; Mathematics; education

1. Context and Rationale

John Dewey, the well-known proponent of learning by doing, defines reflective teaching as “behavior which involves active, persistent and careful consideration of any belief or practice”. It is a century old concept which promotes realization alongside teaching and learning, leading to grounding of principles in the mind of a student. Schulman in this modern time, year 1990, provided three major characteristics of this approach: (a) an ethic of caring, (b) a constructivist approach, and (c) tactful problem solving. It is an ethic of caring because the educator wouldn’t want to push his ideas to the learners, taking care of the psychology of development within them and letting them grasp the competence in a manner that would let them consider

their own ideas. It is a constructivist approach in a sense that it considers the frame of mind of the learners and assist them in constructing the whole picture with independence and originality. And it is a tactful problem solving because it does not evolve around rote memory learning of formulas but looks at the problem in its real and practical world, thereby having a truthful course of action on the problem posted.

The Enhanced Basic Education Act of 2013, R.A. 10533, mandates the use of 2C-2I-1R approaches in teaching. They are the constructivist, collaborative, integrative, inquiry-based and reflective teaching approaches. This last one, the reflective teaching approach, was found to be the least used among these five approaches, based on the study made by San Miguel and Pascual (2021) entitled Efficacy of the Use of Different Teaching Approaches in Math, which was conducted in the District of Victoria. Nevertheless, teacher-respondents expressed the desire of exploring this approach in their classroom sessions.

This time of pandemic, now that the Philippine education setting is entering the now normal of education in which blended learning is the most prevalent mode and the face-to-face learning is returning with, how can reflective teaching approach play a vital role in delivering quality education to the youth? What can teachers learn from the use of reflective teaching approach during the pandemic which they can use, sustain or innovate in this time of now normal? These are some of the issues that this study explored.

2. Literature Review

As reflective teaching is a way of making learning takes into deeper sense for the students, this practice also aids in leading teachers into exploring their ways, their teaching approach and strategy, and ultimately into having professional development, as Mathew, Mathew and Peechattu (2017) concluded in their article entitled "Reflective Practices: A Means to Teacher Development".

Sinno (2016) in her study came out with supporting and inhibiting factors in teacher's practice of reflection in their teaching and learning process. The main supporting factor is openness to change and improvement, while the inhibiting factors are time constraints, culture and teacher's own resistance.

The study made by Mesa (n.d.) highlights the importance of reflection for teachers' growth, and they are the following: (1) alternative to raise awareness about English language teaching, (2) means to encourage teachers to open their minds, (3) an avenue to update teaching methodologies, and (4) a way to make adjustment in teachers' lesson.

Richards and Lockhart (2007) in their book entitled "Reflective Teaching in Second Language Classrooms" describe reflective approach to teaching as

"...one in which teachers and student teachers collect data about teaching, examine their attitudes, beliefs, assumptions, and teaching practices, and use the information obtained as a basis for critical reflection about teaching."

On the other hand, Race (2002) defines the act of reflecting as

"...one which causes us to make sense of what we've learned, why we learned it, and how that particular increment of learning took place. Moreover, reflection is about linking an increase of learning to the broader perspective of learning-heading towards seeing the bigger picture."

They also lined up salient questions in mind that a teacher frequently ask as they evaluate their classroom sessions: (1) How can I collect information about my own teaching? (2) What are my beliefs about teaching and learning, and how do these beliefs influence my teaching? (3) Where do these beliefs come from? (4) What kind of teacher am I? (5) What beliefs do my learners hold about learning and teaching?

These questions can be transformed so as to aid learners as well in their reflection: (1) How can I collect information regarding my teacher's presentation? (2) What are my beliefs about learning, and how do these beliefs influence my acquisition of knowledge? (3) Where do these beliefs come from? (4) What kind of student am I? (5) What beliefs do my classmates or groupmates hold about learning?

Imran, et. Al. (2014) conducted a study on the use of reflective teaching approach in language

teaching. They found out that this teaching strategy can bring about rewarding outcomes to learners performance if this strategy is implemented well with consciousness and continuity.

According to Kilpatrick, et. al (n.d.), there are three steps in a reflective teaching method (RTM): (1) plan, (2) teach, and (3) debrief. In the debriefing stage, the teacher can ask the following questions to himself: (1) How do you think the lesson went?, (2) What worked, what didn't work? (3) What would you do differently if you could teach the lesson again? (3) When ___ happened, why did you decide to do ___ ? (4) What did you mean by ___ ? (5) Based on what happened today, what will you do when the class meets again?

In the study made by Yanuarti and Treagust (2016), they mentioned about the problem on using reflective teaching approach in classrooms. They pointed out that the teacher participants did not recognize this practice, and that what they know about reflection is that the learners should do the reflection part on what they learn, why they need to learn, how they learn, and how they can make use of what they learn. The teachers' view about reflective approach is more on the learners' part, and not on the teaching practice. Based on the responses of the teacher-participants on Yanuarti and Treagust study, there are three types of teachers in light of reflective teaching practice: (1) the descriptive teacher, (2) the comparative teacher, and (3) the critical teacher. From the teacher-participants in the study, only one conducted reflection and was considered critical reflective teacher.

In terms of the effect on the academic performance of learners, Kaung (2020) found out in the study that reflective teaching practice have positive impacts on learners' academic performance and even on observable academic competencies.

Mirzaei and Phang (2013) mentioned in their study the five thinking skills that a reflective teacher is trying to have his learners manifest – observation, communication, team working, judgment and decision making. These five thinking skills can be manifested through activities such as recording lessons, writing, drawing, photography, learning journal, portfolio, lesson plan, co-teaching and collaborative practitioner enquiry in classroom.

Liston and Zeichner (1987) in their book entitled "Teaching Student Teachers to Reflect" laid down four levels of reflection: 1. Factual (reflection focused on routines and procedures of classroom teaching); 2. Procedural (reflection centered on the evaluation of teaching outcomes); 3. Justificatory (reflection about rationales for education); and 4. Critical (reflection focused on a critical examination of education as it impacts social justice and the pre-service teachers own professional development).

Even with school effectiveness, reflective teaching approach has its connection. In the study made by Saulsberry, et. al. (2012), they found out that the participating middle school teachers' perceived usage of reflective practice is significantly related to the perception on school effectiveness. Even though the level of effectiveness was perceived not on a high level, it still has a significant correlation to the reflective teaching practice of the teachers in classroom sessions.

Even on online learning, the effect of reflective teaching approach can be recognized. LaPrade, Gilpatrick and Perkins (2014) found out in their study that when they use a Five-by-Five reflective intervention in their online engagement with learners, significant positive effects was shown statistically, and this is noticeable in the increased participants of learners in discussion forums, thereby showing a proof of quality instructional technique. This is supported by the study made by Adebisi (2020) which claimed that reflective teaching strategy produced better achievement among learner participants.

On the other hand, the study made by Cornford (2002) has a different result, but according to him, does not necessarily mean non-importance of critical analysis among teachers and learners as well. According to the findings he had in his study, there is no enough evidence to claim that reflecting teaching approach can result in superior teaching or learning, especially for beginning teachers. He reasoned out that there is still great confusion about the practice, thereby still needing additional study about the concept and nature of this

approach. This is not to deny the importance of critical analysis, according to him. The problem lies on how this skill can be tapped through reflective teaching approach which has been neglected in classroom practice. Retention of learning is important and can be heightened whatever is the approach that the teacher uses based on the needs, goals, background and experience of learners.

The above-mentioned readings shed in analyzing the findings that resulted out of this exploration and in the development of the concepts for this study.

2.1. Action Research Questions

This study focused on finding out the effectivity of the use of reflective teaching approach this time of pandemic, during the school year 2021-2022.

Specifically, it sought answer to the following questions:

- What is the mean level of academic performance of learners in General Mathematics and Statistics & Probability subjects during the school year 2020-2021, when the reflective teaching approach was not yet maximized?
- What is the mean level of academic performance of learners in General Mathematics and Statistics & Probability subjects during the school year 2021-2022, when the reflective teaching approach was being maximized?
- Is there a significant difference in the academic performance of learners in General Mathematics and Statistics & Probability before and after the optimum use of reflective teaching approach?
- What is the mean level of learners' perception to the reflective teaching in terms of the following aspects:
 - a. ethic of caring
 - b. ownership of learning
 - c. practical sense
 - d. looking into cause or reasons, and
 - e. self-checking aspect.
- What are some other benefits of the use of reflective teaching approach aside from the aspect of academic performance?

2.2. Proposed Innovation, Intervention and Strategy

Reflective teaching approach has already been established as one of the effective ways to lead learners in acquiring knowledge, skill and aptitude that they need to advance to a higher level of learning. Alongside constructivism, collaborative, integrative and inquiry-based, reflective teaching approach is being mandated to be used in dealing with 21st century learners. The reflective approach means looking at what the teacher and learners do in a classroom, thinking about why they do it, and analyzing about it if it works.

When the pandemic hit the Philippines and was put under national quarantine last March 16, 2020, the succeeding school year becomes a grope in the dark no how to deliver quality education to the youth. The school year 2020-2021 becomes the testing period for the resiliency of Philippine Educational system. The approaches that could have been used for delivering quality education became nowhere to be found, as majority of the stakeholders chose modular distance learning as a means of delivering knowledge. For the school year 2020-2021, it can be said that reflective teaching approach was hardly realized as teachers just need to send modules and retrieve outputs. Nevertheless, it can't also be denied that some modules, learning packets and supplemental materials still have the reflective approach as these materials provide opportunities for learners to reflect on their learnings.

For the second school year of pandemic, 2021-2022, the author maximized the use of reflective teaching approach by introducing closure part in the lesson that has application tone into practical living though the subject is General Mathematics and Statistics & Probability for Grade 11, first and second semester respectively. The last part of the QR-coded supplemental materials designed by the author for his learners has the reflective tone as it relates the day’s topic to practical living. The learners are then asked to share their insights in a journal or through social media, so as to unload their thoughts about the subject and have a debriefing of the Math lesson that they have learned. The sample of the brochure below showcase the closure part which serves as reflective note for learners.



Try this!

A teacher saves P5,000 every 6 months in a bank that pays 0.25% compounded monthly. How much will be her savings after 10 years?

Given: $R = 5000$
 $n = 2(10) = 20$ payments
 $i^{(12)} = 0.25\% = 0.0025$
 $m = 12$

Find: F

Digging deeper!



Example 3. Ken borrowed an amount of money from Kat. He agrees to pay the principal plus interest by paying P38,973.76 each year for 3 years. How much money did he borrow if interest is 8% compounded quarterly?

Given: $R = 38,973.76$
 $i^{(4)} = 0.08$
 $m = 4$
 $n = 3$ payments

Find: present value P

Closure

Resolve to be happy amidst problems, trials and challenges. Remember, our situations cannot be controlled, but our dealings on them depend upon our responses.

Elymar A. Pascual



Your success and happiness lies in you. Resolve to keep happy and you & your joy shall form an invincible host against difficulties.

helen keller

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Some parts of this learner's material are original of the author, and other parts, especially the Getting into it! portion was adopted from General Mathematics textbook, copyright 2016.

Let's explore Math!

General Mathematics—
Instructional Material



Difference between Simple and General Annuities

(M11GM-ITc-2)

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Fig. 1. Sample teacher-made brochure which is also QR-coded, showing the closure part as sample reflection for learners to follow

3. Action Research Methods

3.1. Participants and/or other Sources of Data and Information

The chosen participants are the advisory class of the researcher for two school years, 2020-2021 and 2021-2022. They are the ABM 11 Vibrant of Talangan Integrated National High School. The table below shows the demographic profile of the participants based on school year and sex.

Table 1. Participants of the study

School Year	Male	Female	Total
2020-2021	12	20	32
2021-2022	13	21	34
Total	25	41	66

3.2. Data Gathering Methods

The general semestral average of learners in General Mathematics and Statistics & Probability which are two of the core subjects for SHS Grade 11 learners were gathered for two consecutive school years – s.y. 2020-2021 and 2021-2022. It was during the s.y. 2020-2021 when the reflective teaching approach through the QR-coded brochures were not yet implemented, while on the next school year, 2021-2022, it was the time when the reflective teaching approach was implemented through the use of the Closure reflection and journal writing. These were the necessary data in answering research questions 1 and 2.

An online survey on the five aspects of reflective teaching approach was done through Google form and it was the 35 ABM students of school year 2021-2022 who were enjoined to fill up the said form. This suffices research question numbers 4 and 5.

Finally, a focused group discussion with selected 8 ABM learners was done to clarify their responses in the online survey. This aided in the formulation of themes with regards to the benefits of using reflective teaching approach.

3.3. Data Analysis Plan

The following ways of data analysis for each of the research questions is presented below:

Research Question Number 1	→	mean and standard deviation
Research Question Number 2	→	mean and standard deviation
Research Question Number 3	→	t-test for independent samples
Research Question Number 4	→	mean and standard deviation
Research Question Number 5	→	thematic analysis

3.4. Ethical Issues

To adhere to the ethical standards of doing research, the following actions that the author have undergone are the following:

1. Submission of the action research proposal to the school head of Talangan Integrated National High School, asking for her approval and guidance as the research was being conducted
2. Non-disclosure of the identity of each student, both in school year 2020-2021 and 2021-2022
3. Voluntary filling-up of the Google form through invitation in closed group
4. Informed consent of those who would be part of the focused-group discussion

4. Discussion of Findings

4.1. Mean Level of Academic Performance of Learners in Mathematics (Gen Math & Stat & Prob) with Reflective Approach was not yet Used (s.y. 2020-2021)

Table 2. Learners’ average performance in SHS Math core subjects when reflective approach was not used

Number of ABM Learners	Mean	SD	Interpretation
32	86.70	5.87	Above Average

The table above shows the mean level of academic performance of learners in SHS Math Core Subjects (Gen Math and Stat & Prob) for the 32 ABM learners of TINHS for s.y. 2020-2021 when reflective approach was not used. The mean 86.70 is interpreted as above average. The standard deviation of 5.87 signifies heterogeneity and can be attributed to different factors such as Math foundation, Junior High School culture (from where they came from), student factors, and even family support.

4.2. Mean Level of Academic Performance of Learners in Mathematics (Gen Math and Stat & Prob) with Reflective Approach was Used (s.y. 2021-2022)

Table 3. Learners’ average performance in SHS Math core subjects when reflective approach was used

Number of ABM Learners	Mean	SD	Interpretation
34	89.38	4.77	Above Average

The table above shows the mean level of academic performance of learners in terms of their average in SHS Core Math subjects (Gen Math and Stat & Prob). This came from the 34 ABM learners of TINHS for s.y. 2021-2022 when reflective approach was used. The mean of 89.38 is interpreted as above average, and noticeably 2.68 points higher than the previous school year. The standard deviation which is 4.77 still connotes heterogeneity but 1.10 points lower than the previous school year, signifying better performance because of lower variability.

4.3. Difference in Academic Performance of in Mathematics (Gen Math and Stat & Prob) with and without the use of Reflective Approach

Table 4. T-test (independent samples) result for academic performance with and without the use of reflective approach

Approach	Mean	SD	t-value	t-crit	p-value	Decision
Without the use of Reflective Approach	86.70	5.87	-2.05706	1.998	0.043761	Significant
With the use of Reflective Approach	89.38	4.77				

alpha = 0.05

The table above highlights the difference of academic performance of learners in for SHS Core Math subjects without and with the use of reflective teaching approach. Using t-test for independent samples, it can

be seen that the absolute computed t-value is 2.05706, which is higher than the critical value 1.998. This leads to the decision that there is a significant difference between the academic performance of learners in for SHS Core Math subjects without and with the use of reflective teaching approach. This is supported by the p-value 0.043761 which is lower than the alpha value 0.05. With 95% level of confidence, it can be said that there is enough evidence to claim that there is a significant difference in the academic performance of learners in for SHS Core Math subjects without and with the use of reflective teaching approach, that is, learners perform better (mean of 89.38) when reflective teaching approach was used than when reflective teaching approach was not used (mean of 86.70).

The findings in this study supports the findings of the study made by Imran, et. Al. (2014), though their study focused on language teaching. Both previous study and present study claims that teaching strategy can bring about rewarding outcomes to learners' performance if this strategy is implemented well with consciousness and continuity.

4.4. Ethic of Caring

Table 5. Mean level of learners' perception on the ethic of caring aspect of reflective approach

Indicators	Mean	SD	Interpretation
1. The teacher takes care of the psychological development of the learner through the closure part of the brochure.	4.45	0.60	Very Highly Satisfactory
2. Teachers' care for learners are seen in reflective approach because he does not push his ideas to the learners in the closure/reflective part of the lesson.	4.15	1.14	Highly Satisfactory
3. The teacher is letting the learners grasp the competence in a manner that the learner ideas are being considered.	4.10	0.60	Highly Satisfactory
4. The reflective part of the brochure touches not only the academic part of life but also the real world of life and living.	4.40	0.60	Very Highly Satisfactory
5. The closure part of the brochure is humanistic in touch, considering the total whole being of the learner, and not just the mental stature.	4.30	0.57	Very Highly Satisfactory
Weighted Average	4.28	0.70	Very Highly Satisfactory

Legend	4.21 – 5.00	Very Highly Satisfactory
	3.41 – 4.20	Highly Satisfactory
	2.61 – 3.40	Satisfactory
	1.81 – 2.60	Below Satisfactory
	1.00 – 1.80	Unsatisfactory

The table above shows the first aspect of reflective teaching and learning – ethic of caring. The mean, standard deviation and interpretation presented were the summary of responses of the 32 ABM learners who have experienced reflective teaching approach last s.y. 2021-2022. Teacher taking care of psychological development of the learner received a mean value of 4.45, interpreted as highly satisfactory. Teacher not pushing his ideas to the learners gained a mean value of 4.15, interpreted as moderately satisfactory. The teacher considering the ideas of learners obtained a mean value of 4.10, interpreted as moderately satisfactory. The reflective part of the brochure touching the real world of life and living received a mean value of 4.40, interpreted as highly satisfactory. The closure part of the brochure having humanistic touch gained a mean

value of 4.30, interpreted as highly satisfactory. The weighted mean of 4.28 shows that the ethic of caring as one of the aspects of reflective teaching and learning is highly satisfactory according to the perception of the respondents. The weighted average of the standard deviation which is 0.70, being lower than 1, signifies conformity in the responses of the participants.

4.5. Ownership of Learning

Table 6. Mean level of learners' perception on the ownership of learning aspect of reflective approach

Indicators	Mean	SD	Interpretation
1. Learners are able to personalize their learning when they write on a journal their insights on the principle posted in the closure part of the brochure.	4.35	0.49	Very Highly Satisfactory
2. The reflective part of the brochure considers the frame of mind of the learners.	4.30	0.66	Very Highly Satisfactory
3. The reflective part of the brochure assists learners in constructing the whole picture with independence according to their background and experience.	4.30	0.51	Very Highly Satisfactory
4. The reflective part of the brochure causes learners to construct the whole picture of the lesson in their own original interpretation of the scenario.	4.50	0.51	Very Highly Satisfactory
5. The closure part of the brochure intends for learners to make their learning in-tack to their life as they discover things out of their own reflective thinking.	4.40	0.60	Very Highly Satisfactory
Weighted Average	4.37	0.55	Very Highly Satisfactory

Legend	4.21 – 5.00	Very Highly Satisfactory
	3.41 – 4.20	Highly Satisfactory
	2.61 – 3.40	Satisfactory
	1.81 – 2.60	Below Satisfactory
	1.00 – 1.80	Unsatisfactory

The table above shows the second aspect of reflective teaching and learning – ownership of learning. The mean, standard deviation and interpretation presented were the summary of responses of the 32 ABM learners who have experienced reflective teaching approach last s.y. 2021-2022. Learners being able to personalize their learning when they write on their journal received a mean value of 4.35, interpreted as highly satisfactory. Consideration of the frame of mind of the learners gained a mean value of 4.30, interpreted as highly satisfactory. Assistance to learners in constructing the whole picture obtained a mean value of 4.30, interpreted as highly satisfactory. Constructing the whole picture in learners' own original interpretation of the scenario received a mean value of 4.50, interpreted as highly satisfactory. Lessons being in-tacked to learners' life gained a mean value of 4.40, interpreted as highly satisfactory. The weighted mean of 4.37 shows that the ownership of learning as one of the aspects of reflective teaching and learning is highly satisfactory according to the perception of the respondents. The weighted average of the standard deviation which is 0.55, being lower than 1, signifies conformity in the responses of the participants.

4.6. Practical Sense

Table 7. Mean level of learners' perception on the practical sense aspect of reflective approach

Indicators	Mean	SD	Interpretation
1. The reflective part of the brochure approaches life application in a truthful/tactful way.	4.35	0.59	Very Highly Satisfactory
2. The reflective part of the brochure does not evolve around rote memory learning of formulas.	3.80	1.01	Highly Satisfactory
3. The closure part of the brochure looks at the problem in a real and practical world.	4.20	0.91	Highly Satisfactory
4. The closure part of the brochure resorts into having a truthful course of action on the topic taken or Math problems solved.	4.10	0.91	Highly Satisfactory
5. The last part of the brochure shows the real world and leads the learners to see the application of lesson to practical scenario.	4.35	0.75	Very Highly Satisfactory
Weighted Average	4.16	0.83	Highly Satisfactory

Legend	4.21 – 5.00	Very Highly Satisfactory
	3.41 – 4.20	Highly Satisfactory
	2.61 – 3.40	Satisfactory
	1.81 – 2.60	Below Satisfactory
	1.00 – 1.80	Unsatisfactory

The table above shows the third aspect of reflective teaching and learning – practical sense. The mean, standard deviation and interpretation presented were the summary of responses of the 32 ABM learners who have experienced reflective teaching approach last s.y. 2021-2022. Approaching life application in a truthful or tactful way received a mean value of 4.35, interpreted as highly satisfactory. Not revolving around rote memorization of formulas gained a mean value of 3.80, interpreted as moderately satisfactory. A look into Math problems in a real, practical world obtained a mean value of 4.20, interpreted as moderately satisfactory. Resorting into having truthful course of action received a mean value of 4.10, interpreted as moderately satisfactory. Showing the real world and leading the learners to see the application of lesson gained a mean value of 4.35, interpreted as highly satisfactory. The weighted mean of 4.16 shows that the practical sense as one of the aspects of reflective teaching and learning is moderately satisfactory according to the perception of the respondents. The weighted average of the standard deviation which is 0.83, being lower than 1, signifies conformity in the responses of the participants.

4.7. Looking into Cause or Reasons

Table 8. Mean level of learners' perception on looking into cause or reasons as aspect of reflective approach

Indicators	Mean	SD	Interpretation
1. The reflective part of the brochure leads into learners' seeking of reason why things in the environment happen that way.	4.15	0.75	Highly Satisfactory
2. The closure part of the lesson allows the learners to seek for reason why is it important to gain knowledge and wisdom.	4.55	0.60	Very Highly Satisfactory

3. The reflection part of the brochure is assistive of learners to discover the deep reasons why problems in life or in learning arise.	4.30	0.61	Very Highly Satisfactory
4. The ending part of the brochure aids the learners in reflecting on the effects of gaining knowledge and wisdom.	4.50	0.61	Very Highly Satisfactory
5. The last part of the brochure provides starting idea for learners for them to consider causes or reasons of outcomes for every decision we make in studying or in life.	4.40	0.68	Very Highly Satisfactory
Weighted Average	4.38	0.65	Very Highly Satisfactory

Legend	4.21 – 5.00	Very Highly Satisfactory
	3.41 – 4.20	Highly Satisfactory
	2.61 – 3.40	Satisfactory
	1.81 – 2.60	Below Satisfactory
	1.00 – 1.80	Unsatisfactory

The table above shows the fourth aspect of reflective teaching and learning – looking into course or reasons. The mean, standard deviation and interpretation presented were the summary of responses of the 32 ABM learners who have experienced reflective teaching approach last s.y. 2021-2022. Leading learners into seeking for reason why things in the environment happen received a mean value of 4.15, interpreted as moderately satisfactory. Allowing learners to seek for reason and importance of acquiring knowledge and wisdom gained a mean value of 4.55, interpreted as highly satisfactory. Assistance to learners in discovering deep reasons of life problems obtained a mean value of 4.30, interpreted as highly satisfactory. Aiding learners in reflecting on the effects of gaining knowledge and wisdom received a mean value of 4.50, interpreted as highly satisfactory. Providing starting idea for learners to consider gained a mean value of 4.40, interpreted as highly satisfactory. The weighted mean of 4.38 shows that looking into cause or reasons as one of the aspects of reflective teaching and learning is highly satisfactory according to the perception of the respondents. The weighted average of the standard deviation which is 0.65, being lower than 1, signifies conformity in the responses of the participants.

4.8. Self-checking Aspect

Table 9. Mean level of learners' perception on the self-checking aspect of reflective approach

Indicators	Mean	SD	Interpretation
1. The last part of the brochure allows learners to reflect on their attitude in learning or life.	4.15	0.81	Highly Satisfactory
2. The reflective part of the brochure aids in self-realization of the learners' strengths or shortcomings in attaining goals.	4.20	0.89	Highly Satisfactory
3. The closure part of the brochure debriefs learners of the competency or moral values attained through the lesson.	4.20	0.61	Highly Satisfactory
4. The reflection part of the lesson provides way of considering next step towards personal growth.	4.50	0.61	Very Highly Satisfactory
5. The closure session of sharing ideas or writing in a journal is a way of evaluating present attitude and assist in the developing of needed course of action for betterment.	4.30	0.66	Very Highly Satisfactory
Weighted Average	4.27	0.72	Very Highly Satisfactory

Legend	4.21 – 5.00	Very Highly Satisfactory
	3.41 – 4.20	Highly Satisfactory
	2.61 – 3.40	Satisfactory
	1.81 – 2.60	Below Satisfactory
	1.00 – 1.80	Unsatisfactory

The table above shows the fifth aspect of reflective teaching and learning – self-checking. The mean, standard deviation and interpretation presented were the summary of responses of the 32 ABM learners who have experienced reflective teaching approach last s.y. 2021-2022. Allowing learners to check on the attitude in learning or life received a mean value of 4.15, interpreted as moderately satisfactory. Aiding in the self-realization of the learners' strengths or shortcomings gained a mean value of 4.20, interpreted as moderately satisfactory. Debriefing learners of the competency or moral values attained obtained a mean value of 4.20, interpreted as moderately satisfactory. Considering next step towards personal growth received a mean value of 4.50, interpreted as highly satisfactory. Way of evaluating present attitude and assistive of the development of needed course of action gained a mean value of 4.30, interpreted as highly satisfactory. The weighted mean of 4.27 shows that self-checking as one of the aspects of reflective teaching and learning is highly satisfactory according to the perception of the respondents. The weighted average of the standard deviation which is 0.72, being lower than 1, signifies conformity in the responses of the participants.

4.9. Benefits of the Use of Reflective Approach

Table 10. Frequently appearing words on the qualitative response of learners regarding the benefits of reflective approach

Word	Frequency
Students	9
Reflective	8
Teaching	8
Learning	7
Helps	7
Understand	5
Better	5
Knowledge	5
Life	4
Professional	4

The table and the pie-chart word cloud associate show the top 10 frequently appearing words in the qualitative response of 32 learners on the question “What are some other benefits of the use of reflective teaching approach aside from the aspect of academic performance?” The top 10 frequently appearing words are “students”, “reflective”, “teaching”, “learning”, “helps”, “understand”, “better”, “knowledge”, “life” and “professional”.

The pattern thus developed from the frequently appearing words. with the light of the participants qualitative responses in online survey and focused group discussion is this:

“Reflective teaching helps students understand better as it fosters view of real life, seeking reasons for learning and gaining knowledge that leads to professional growth in future.”

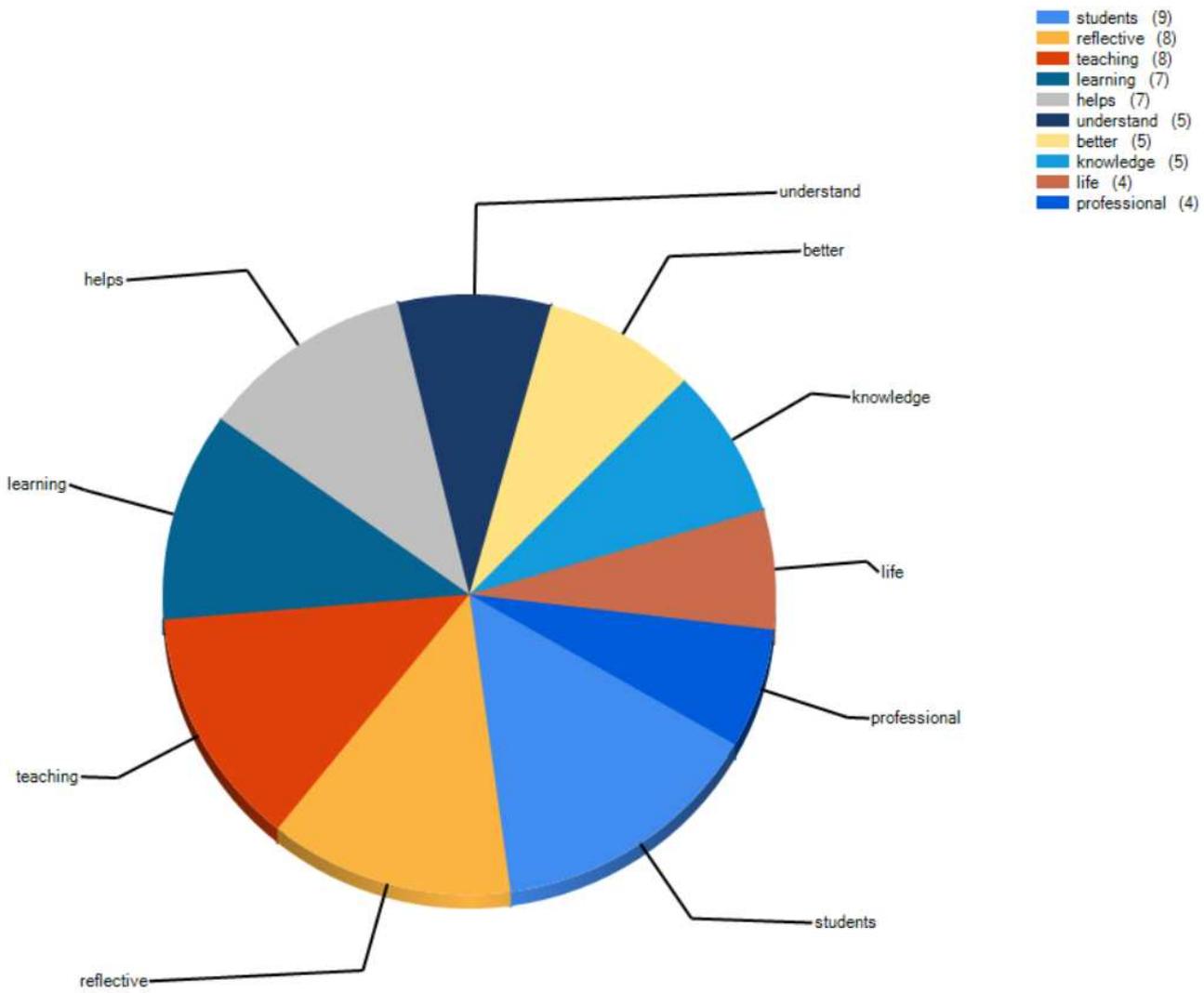


Fig. 2. Pie-chart word cloud of frequently appearing words on qualitative response of learners about the benefits of reflective approach

Reflective teaching approach helps to improve choosing goals and overcoming real life problems. It aligns one's fundamental assumptions about learning and instructional strategies. Teaching that is reflective fosters professional growth in the near future, too. The value that learners obtained in seeking knowledge and wisdom with the right attitude is being brought even out of the four corners of the classroom and is being applied when learners are already in the world of work. This is for the simple reason that reflective teaching supports student-centered learning in which the learner becomes independent and responsible for his own action.

5. Recommendations and Reflection

5.1. Recommendations

With the foregoing discussion of findings, the following recommendations were laid down to the target group of persons:

- **Math teachers** should maximize the use of reflective teaching approach not just in the closure(debriefing) part of the lesson, but in the briefing stage and abstraction part of the lesson as well. How students learn, why do they seek for knowledge, what strengths and weakness do they see in themselves while learning are just some important aspects that teachers need to deal with the learners so that they themselves can have self-checking and align their attitude the next time they meet in classroom. Writing in a reflection journal is one way of leading learners to have self-checking on the things they have discovered about the lesson and about themselves as well while taking part of the teaching-and-learning process.
- **Department of Education officials** should initiate programs, seminars and conferences that would promote the use of reflective teaching approach, so much so that the 21st century learners are getting hooked into social media activities and are already forgetting the value of self-introspection. Launching seminars and workshops on effective delivery of competency using reflective teaching will provide skills for teachers in maximizing the use of this approach. Conference can also focus on teacher-reflection and not just student reflection. Teachers should be in the habit of reflecting on their teaching-and-learning process every time they handle class.
- **Curriculum developers and instructional material writers** should provide guide for teachers or end-users (learners) on the implementation or use of the materials in such a way that learners will have ample time for reflection before the introduction of new topic, while the lesson is being discussed, and after the delivery of the competency.
- **Future researchers** can explore on the effectiveness of reflective teaching approach in other disciplines or subject area, and investigate on other ways of having reflection aside from self-checking and journal writing.

5.2. Reflection

As this part of the study represents what the content of the paper is all about (the reflection aspect of teaching and learning), the author would like to have a good deal of reflection on how the study went on, what he learned from it, and what were the things he discovered in himself. It was an interesting note that through this investigation, the author was able to look back on the times he was leading the learners to have reflection on the day's session by writing on a journal notebook, letting them share their thoughts in the hearing of other learners, and in reading what they have written during the author's vacant time. The author personally realized in himself the ethic of caring in this approach because he was able to connect to the learners through the things they have penned in their reflection notebook. The author learned that it was not only the learners are having a self-check of what they learned and the attitude they have shown in classroom discussion, but at the same time, the teacher was able to reflect on his lesson planning and execution of it. The author discovered in himself the intrapersonal skill he has because of the love for reflecting on the things that happened in a day's session.

Both learners and teachers need this attitude of self-checking. Baltasar Grecian, a Spanish Jesuit and baroque prose writer and philosopher once said, "Self-reflection is the school of wisdom." There is a high call today to bring about and promote the use of reflective teaching approach in classrooms, whether physical or

virtual. If teachers and learners will not have the attitude of reflecting, then they are losing a big part of what should have been learned and treasured. Bryan McGill, a human potential thought leader, reiterated, “People who have had little self-reflection live life in a huge reality blind-spot.” Reflective teaching approach will indeed immerse students in the value of seeking knowledge and wisdom that they can bring towards their own professional growth when they go out of the field and become effective workforce of our nation.

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