

Performance Feedback and Monitoring Notebook (PF&MN): Influence on Performance, Students' Views and Achievement in Physics

Dario L. Logmao

dario_logmao@tup.edu.ph

Physics Department, College of Science

Technological University of the Philippines

Abstract This study determined the influence of Performance Feedback and Monitoring Notebook (PF&MN) on the seven areas of performance, the views of two classes of Bachelor of Graphics Technology major in Architecture Technology (BGT-AT) composed of 59 students is in this feedback mechanism on assessments (formative and summative), and their achievement in Physics. The PF&MN is an assessment portfolio, containing necessary information of the students, a summary of the students' accomplishments, answer sheets for written assessments, and feedbacks for each assessment. The notebook was used for the assessments and served as the record of the scores obtained in each test. Surveys before taking the post achievement test obtained the views of the students on the use of the notebook, and its influence on performances. Results showed that the notebook has a high positive influence in the area of "assessment of learning," and moderate positive influence on the other six areas of performance considered in this study. The notebook monitored performance, profoundly reflected the performance, and encouraged students to perform better in Physics. There was a significant change in the achievement of the students in this study, which may be due to the influence of the notebook on performance in Physics; thus, using the PF&MN continuously in Physics and other subjects is highly recommended.

Keywords: achievement, assessment, feedback, monitoring

Introduction

“Ensure inclusive and equitable quality education and promote lifelong learning” (UN-DESA, 2015: p. 18). This statement is one of the 17 goals for sustainable development adopted by the United Nations Member States in 2015 as the organization celebrated its 70th anniversary. Adopting these goals guarantees one direction in the attainment of peace and prosperity for the people and the planet, and the eradication of poverty in all its forms. Every member nation believes that poverty ends in the classroom, by making education accessible to all and by providing quality education to every individual.

Worldwide, quality education can be attained by continuously monitoring the achievement of each stakeholder nation in education. Trends in International Mathematics and Science Study (TIMMS) helps monitor this achievement. More than 60 countries participate in the TIMMS. Any country that participates in this study generates information related to the achievement of the students (Grades 4, 8, and 12) compared to any of the participating countries. This information includes the learning level of students in science and mathematics, the background of the students, teachers, schools, curricula and official education policies that allow cross-national comparison of educational content related to students’ achievement.

The Philippines participated in TIMMS in 1995, 1999, and 2003 and will participate in 2019 (Provansik et al., 2016). This participation proves that the Philippine government and every stakeholder in education including school management and staff, teachers, and parents adhere to the goal of ensuring inclusive and equitable quality education and are concerned with the achievement of Filipino students. Every stakeholder invests for the welfare, success, and better achievement of the students. Teachers invest their time and effort to develop instructional materials and adapt teaching strategies appropriate to the learners aiming for better achievement.

However, despite these efforts, the achievement of students is still low as reflected in several studies conducted in the tertiary, secondary, and elementary levels. The National Achievement Test (NAT) administered by the National Educational Testing Research Center (NETRC) to elementary (Grade 3 and Grade 6), and secondary (Fourth Year) students in 2015 resulted to a mean percentage score (MPS) far below the target passing rate of 75%, which are 57.11% in the secondary and 68.32% in the elementary. Accurately, Villasis (2018) reported in her study that in the Schools Division of Taguig City and Pateros, one of the top performing division in Metro Manila, the posted MPS is 63.98% in Filipino, 54.83% in Araling Panlipunan, 59.56% in Mathematics, 55.82% in Science, 52.74 % in English, and 54.20% in Critical Thinking Skills. Leveling students achievement may be due to several factors including lack of motivation to study hard, and the inability of the teacher to monitor students' performance.

Monitoring and Reflecting on Classroom Performance

It is vital to understand the position of the students in the educational process. This information may be achieved by monitoring through fair, balanced, and unbiased assessment approaches (Sanders, 2019). Most teachers employ several approaches to monitor classroom performance; one would be using formal assessments, tests, or rubrics designed to evaluate a student's understanding of the subject. These assessments, in most cases, may be taken directly from the curriculum and to be effective, should be given within controlled conditions, and the students understand what is expected of them ahead of time. Second, the teacher's observation of his/her students provides informal assessments of classroom performance. Some teachers use a checklist to keep track of things like participation, oral reading skills, and behavior. Third, portfolios are excellent tools to monitor classroom performance over time. They include samples of student work from different times during the school year. Finally, peer and self-assessments are valuable tools for monitoring classroom performance. Learning involves students and it is necessary that they are involved in

assessing their performance. Aside from the feedback they get from the teacher, students can be motivated by peer feedbacks, if uplifting and encouraging, the classroom atmosphere becomes more positive, and effort increases as a result, thus self-assessment is also essential. By making the teacher's expectations clear, the students will be able to determine their accomplishments against the expectations. As a result, they will learn more about their skills and take more ownership of their learning.

The need to monitor the academic progress of the students is a must being one of the responsibilities of the teacher. In monitoring, the teacher gathers information on the student's accomplishments and identifies the student's position concerning the target learning objectives. The teacher can determine the accomplishments of every student and assesses his or her performance in the course by regular monitoring, which may do the appropriate intervention whenever the accomplishment or performance is below the passing standard (Victoria, 2016).

Monitoring of students' academic progress can be done using a portfolio. Portfolio provides advantages in monitoring academic progress, that includes a) involvement of learners, b) increase of students' accountability, c) a common vision of goals, d) authentic picture of learning, e) improved teaching and learning, and f) reflection of assessment reform (Mokhtaria, 2015).

Reflection, according to the Center for New Designs in Learning and Scholarship at Georgetown University (n.d.) makes learning more meaningful for students, enabling them to develop a personal relationship with the material at hand and views their performance on a task against the accomplishment of the whole class. Each activity may include reflection to develop better learning. These activities include retrieval (recalling recently learned knowledge to mind), elaboration (connecting new knowledge to what you already know), and generation (rephrasing critical information by yourself in your own words and practice using it mentally on other situations). Reflection requires severe processing that makes it more likely that students will be able to

absorb, remember, and master what they are learning.

Feedback and Assessment Portfolio in Education

Portfolios come in different forms, including an assessment portfolio for classroom purposes. The assessment portfolio compiles the completed works of the student that show his/her progress leading to the attainment of course objectives and proofs of achievements for the period covered. The students can review, revise, and evaluate the portfolio to enhance learning. This type of portfolio integrates instruction, learning, and assessment.

Feedbacks on the works of the students enhance the use of a portfolio. Teacher, peer, parent, or self can provide feedback on one's performance and can be structured to identify what are lacking in the accomplishments of the students against what are expected of them. Feedback can be done in oral, written or demonstrative forms (Brookhart, 2017) promptly to the right audience with appropriate content in different focus, comparison, function, valence, clarity, specificity, and tone (Mounce, 2014). Portfolio can be a vehicle to provide students with written feedback. The feedbacks provided facilitate the teaching processes and enhance students' learning. Appropriately provided feedbacks make the students feel guided in their academic works and directed in attaining the objectives of the lesson. This feeling brought about by feedback creates a classroom atmosphere that radiates caring attitude of the teacher for the learnings of the students, motivating the students intrinsically, and engaging the students more in the classroom activities. Feedback, when done meaningfully, can significantly enhance and increase student achievement (Stenger, 2014).

Results of investigations conducted by Ocaik and Ulu (2009) showed agreement between students, teachers, and parents on the perceived positive effect of using portfolio in enhancing the achievement of the students. Mogonea (2015), Buckley and

colleagues, 2009; Demirel and Duman, 2014; and Apple and Shimo (2004) cited in Axton (2012) found similar results in their studies on the use of portfolio employing different research designs (experimental, descriptive – survey). They emphasize the belief that this material provides support in learning the subject, enhances knowledge and understanding, intensifies self-awareness, motivates to reflect on one’s performance, and improves the student-tutor relationship. Similarly, Struyven and colleagues (2010) also found that positive learning attitude in using portfolio significantly improved the academic achievement of the students. Lee, Yeh, Kung, and Hsu (2007) also revealed the same findings that attitude is one of the factors associated with academic performance.

Studies of Yusuf and Tuisawau (2011), and Biggs and Tang (2011) proved the effectiveness of using portfolio in enhancing achievement and attitude towards the subject. The students become acquainted with evaluations utilized by the teacher and more or less have the idea on how the assessments will be done using the portfolio.

Technology Integration in Assessment and Feedback

Feedbacks from the teachers, peers and parents on the performance and achievement of the students can be facilitated using technology. Students may keep the record of his/her accomplishment and reflections in the portfolio that enhances learning and responsibility for learning, and the recorded reflections can be utilized in assessing, evaluating and further reflecting anytime. (Norman, 2016) Technology integration in the teaching and learning process yields significant improvement in terms of productivity in the classroom. Technology infuses classrooms with digital learning tools, such as computers and hand-held devices, and enables the use of a wide range of media including texts to show both the learning process and the outputs of learning, making it as a vehicle of effective learning.

Reviewed literature and studies showed the benefits of feedbacks and the advantages brought about by the use of portfolio on motivation and learning of the students. However, the researcher observed that students were not able to monitor their performance in the classroom and on the assessments given to them due to lack or minimal feedbacks provided by the teacher. In this study, the teacher-researcher developed the Performance Feedback and Monitoring Notebook (PF&MN) that resembles an assessment portfolio. The student used this notebook during assessments, they viewed the results of assessments regularly, wrote feedbacks (both the teacher and the student) that served as communication between the teacher and the individual students and possibly motivate the students to study more in Physics.

Purposes of the Research

This study aimed to determine the achievement of the BGT-AT students in Physics, the effect of using the Performance Feedback and Monitoring Notebook (PF&MN) during assessments on the views of the students with the use of this notebook, and the influence of this notebook on the seven areas of performance in Physics. Specifically, the study sought answers to the following:

1. What is the achievement of the students before and after they were taught Physics and used PF&MN during assessments?
2. How do the students view the use of PF&MN during assessment in Physics in terms of
 - (a) monitoring performance, (b) reflecting on performance, and (c) performing better in Physics?
3. What is the level of influence of PF&MN on the seven areas of performance in Physics, namely:
 - (a) attitude towards learning, (b) attitude towards teacher and classmates, (c) class performance, (d)

concern for the use of technology in teaching and learning, (e) preparation for learning, (f) assessment of learning, and (g) concern for the extended use of the notebook?

Framework of the Study

The study grounds on the concept of assessment and feedback mechanisms as presented in Figure 1.

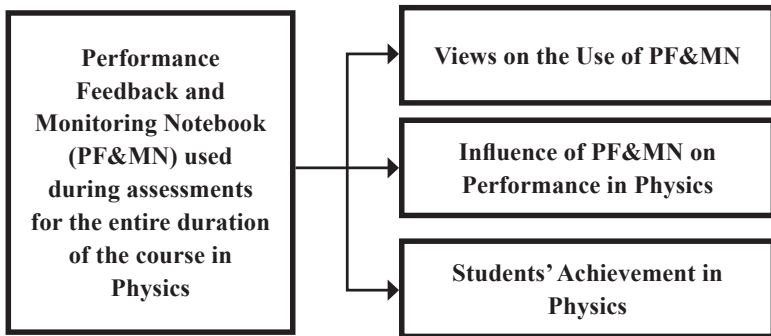


Figure 1. The framework of the study

Figure 1 depicts the effect of the PF&MN utilized during assessments in Physics 1A lecture (Mechanics) on the views of the students with the use of the notebook, the influence of the notebook on their performance in Physics and the achievement of the students in Physics. The views on the use of the notebook are in terms of *monitoring performance, reflecting on performance, and performing better in Physics* while the influence in performance in Physics is on the areas of *attitude towards learning; attitude towards teacher and classmates; concern for the use of technology in teaching and learning; preparation for learning; class performance; assessment of learning; and concern for the extended use of the notebook.*

Methodology

Research Design

This study employed a descriptive research design in determining the views of the students on the use of the PF&MN during the assessments, how the use of this notebook influences their performance in the subject through a survey and the achievement of the students in Physics using a teacher-made test. The t-test for dependent samples determined the difference in the influence of PF&MN on the achievement of the students before and after teaching Physics 1A (Mechanics). Evaluation of the impressions of the students in using the PF&MN to explain further the possible effect of using the PF&MN on the achievement, views in using the notebook, and influence on the performance of the students in Physics utilized qualitative analysis.

Participants

The participants in this study were chosen conveniently from six technology classes handled by the researcher during the first semester of SY 2016-2017. They were classes of Bachelor in Graphics Technology major in Architecture Technology (BGT-AT) taking Physics 1A (Mechanics), the focused subject for this study. Fifty-nine students (34 males and 25 females) with age ranging from 18 to 21 years comprised the selected classes. The students in these classes have either average and below average performance in Mathematics as reflected by their grade point average in College Algebra, (pre-requisite subject of Physics 1A)

Instruments

Achievement Test

The achievement test is a 50-items teacher-made test in Physics 1A (Mechanics) lecture course covering the topics for the entire semester, which include measurement and vectors, motion, force and motion, work, power and energy, equilibrium, momentum,

rotational motion, and simple machines. Following the course syllabus for this course, a table of specifications was constructed to ensure the proportionality of each topic in the test. Bloom's taxonomy of cognitive domains directed the distribution of constructed test items. Items analysis of test items determined the difficulty and discrimination indices of each item, identifying the items to be retained, revised, or rejected. The reliability of the test (obtained using Split-half and Kuder-Richardson Formula-20) has a coefficient of .82.

Performance Feedback and Monitoring Notebook (PF&MN)

This instrument resembles an assessment portfolio, designed by the researcher with parts that include student information page (cover page), a summary of accomplishments pages, formative assessment pages, summative assessment pages, score box and feedback box for each assessment page. There are three pages for the summary of accomplishments, about 20 formative assessment pages and ten summative assessment pages in this notebook. The student information page includes the name of the student, course, year and section, student number, the subject (Physics 1A) and description, professor's name, and a 1 x 1 photo of the student. The score obtained in each assessment is written on the score box and in the summary of accomplishments then signed by the professor. The students wrote their feedbacks related to the assessment also in the feedback box. The students used the PF&MN in the classroom as a monitoring instrument for their assessments where they can reflect on their performance every time they get hold of the notebook.

Survey on views on the use of the notebook and the influence of the notebook on performance

This instrument developed by the researcher comprises two parts; first, the views on the use of the notebook, consist of 10 statistically validated Likert-type items; and second, the influence of the notebook on the performance in Physics contained 15 items

with 5-point Likert-type scale survey in positive and negative directions with a neutral position. Fifty students (similar to the samples in this study) evaluated the surveys statistically. The influence survey has a reliability coefficient of 0.941, and the internal consistency is .928, “excellent.” The survey instruments include an open-ended question on the general impression of the students on the use of PF&MN.

Data Collection

This phase commenced on the first day of classes during the first semester of SY 2016-2017. Before the presentation of the first topic in subject, the achievement test (pretest) determined the prior knowledge of the students in Physics. On the second day, the teacher familiarized the students on the classroom policies, the course syllabus and some teaching strategies to use in the conduct of lessons in this class, which includes the use of the PF&MN. The students received the notebooks, and they accomplished the information required. The teacher informed them of how to use the notebook during assessments.

On the same day, the teacher discussed the first topic (measurement) followed by a short quiz. Each student wrote his or her answers in the quiz on the designated quiz page of the notebook. The teacher checked the quiz right after collecting the notebooks and wrote the score earned by each student on the quiz page and the summary of accomplishments page. On the third session, the discussion of the lesson continued. After the discussion, the students received their notebooks for the assessment, (a seatwork on vector and scalar quantities). The teacher instructed the students to review the results of their previous quiz and reflect on their performance before giving them the seatwork. The teacher checked the seatwork right after the class and recorded the score on the score box and in the summary of accomplishments page. After completing the first chapter (measurement and vectors), a chapter test (summative assessment), using the answer sheet for summative assessments

determined their progress. The teacher checked the works of the students at once, and recorded their scores in the notebook. In these assessments, the teacher provided feedback on the results of the assessments. Likewise, as the semester continues, the teacher recorded the scores for the assignments, and the other formative assessments in this notebook. Table 1 presents a summary of the topics and assessments for the entire semester.

Table 1. Summary of the topics and assessments in Physics 1A (Mechanics)

Topics	Assessments	
	Diagnostic Test (Pretest)	
Measurement of Physical Quantities	Quiz	
Vector and Scalar Quantities	Seatwork	Chapter Test
Operations on Vectors – Vector Algebra	Assignment	
Describing Motion	Assignment	
Uniform Motion and Motion with Constant Acceleration	Quiz	Chapter Test
Freely Falling Bodies	Quiz	
Projectile Motion	Quiz	
Force and Free-Body Diagram	Assignment	
Law of Inertia and First Condition of Equilibrium	Quiz	
Law of Acceleration and Law of Interaction	Quiz	Chapter Test
Applications of Newton’s Laws of Motion	Quiz	
Dynamics of Uniform Circular Motion	Seatwork	
Work and Energy	Assignment	
Work Done by a Constant Force	Quiz	Chapter Test
Conservation of Energy Principle	Seatwork	
Work-Energy Theorem	Quiz	
Gravitation	Assignment	Chapter Test
Impulse and Momentum	Quiz	
Rotational Motion	Assignment	Chapter Test
Simple Machines	Quiz	
	Final Comprehensive Examination (Posttest)	

In this study, the students completed 20 formative assessments (quiz, seatwork, and assignment) and seven summative assessments (six-chapter tests and one final exam/

posttest) using the PF&MN. They answered the survey on views on the use of the PF&MN, and the influence of the notebook on the areas of students' performance before taking the final exams. After the final exams were corrected and recorded, the students received their notebooks for a final review of their accomplishments in the course. Each student computed his/her tentative rating based on the scores he/she had on the notebook following the formula for the final grade as reflected in the course syllabus. The teacher reviewed the computed tentative rating for confirmation and further considerations.

The analyzed data obtained in this study described how effective the notebooks are. The researcher did not include the names of the students in writing the results of this study, and with utmost secrecy and anonymity on the participants' information.

Data Analysis

Comparison of the results of the pretest and posttest determined the achievement of the students in Physics. The t-test for dependent samples applied in the test scores analyzed the comparison. Weighted mean described the students' views on the use of PF&MN as to their agreement/disagreement with each item in the survey. The guide for the analyses of the views can be found in Appendix A. The views of the students on the use of the notebook were separately analyzed. How evident the notebook became a tool in presenting the scores and ratings obtained by the students individually was the basis in analyzing the view in terms of monitoring performance. How far the students were able to think and comprehend about the status of their accomplishments in the course was the basis in analyzing the views in terms of reflecting on performance. How capable is the notebook in encouraging them to study harder mainly when the results of their assessments are low, make and submit assignments and homework, and perform other tasks that could enhance their achievements in the course was the basis in analyzing the views in terms of performing better in Physics.

Weighted mean also analyzed the responses of the students in the influence survey following the interpretation table in Appendix B. Their responses in each item as to the perceived change in their attitude towards learning, attitude towards teacher and classmates, concern for the use of technology in teaching and learning, preparation for learning, class performance, assessment of learning, and concern for the extended use of the notebook determined the influence of the PF&MN in each area of performance. If the perceived change on the responses of the students in the survey is positive, the interpretation is a positive influence on the performance in Physics.

The researcher employed content analysis in the analysis and interpretation of the general impressions of the students on the use of PF&MN. The analysis listed and classified the responses according to their views on the use of PF&MN, and influence on their performance. Generated frequency and percentage of similar responses interpreted the possible effect of the notebook on the students' achievement in Physics.

Results and Discussion

The achievement of BGT-AT students in Physics 1A (Mechanics), their views on the use of PF&MN, and the influence of the notebook on their performance were presented, analyzed, interpreted and compared to the reviewed related studies.

Students Achievement in Physics using PF&MN assessments.

Table 2 presents the mean of the pretest and posttest obtained by the students, the t-value, and the p-value results of the t-test for dependent samples.

Table 2. Comparing the Pretest and Posttest scores of the students (N=59)

Test	Mean	t-value	*p-value
Pretest	12.95	12.152	0.00001
Posttest	19.00		

*p-value < .05 = significant

The achievement of the students after taking Physics using the PF&MN during assessments is higher than their achievement before the introduction of the lessons. The use of the notebook may have influenced this increase in achievement during the assessment. It implies that when students are aware of the form of assessment they are taking and are informed of the result of their assessments, their achievements increase. It seems that this kind of portfolio in science lessons influenced students to achieve better after the study (Cakan et al., 2010).

Views on the use of Performance Feedback and Monitoring Notebook during Assessments.

Table 3 presents the views of all the students in the areas of monitoring performance, reflecting on performance, and performing better in physics and all the areas in this study.

Table 3. Students' view on the use of PF&MN

Views Area	Weighted Mean (\bar{x})	s.d.	Interpretation
Monitoring performance	2.97	0.435	Evident
Reflecting on performance	3.43	0.366	Highly Reflective
Performing better in Physics	3.09	0.424	Encouraging
All areas	3.19	0.281	Agree

As gleaned from Table 3, the students can observe and check the scores they obtained in the assessments (formative and summative) they took in Physics. The students responses on the general impression on the use of the notebook supported this result. Fifty one percent of them similarly expressed, *“I think this performance feedback and monitoring notebook is very helpful for*

us students. It serves as our guide in monitoring our test results and overall performance.”

The students can think deeply or carefully about the scores they obtained in the assessments they took in Physics, determine their performance in each of the assessments and performance in Physics as a whole, and compare their accomplishments to their expected outcomes in the course. Fifty-six percent (56%) of the students' responses are similar and in support of these findings. One of them responded as *“For me, Performance Feedback and Monitoring Notebook is good because I see if I have progress or development in this subject.”*

The notebook with the results of the assessments could have motivated the students and encouraged them to review their lessons, do their assignments, read and study harder to improve their scores in the assessments in this subject. The responses of 24% of the students on the general impression on the use of the notebook are nearly the same and supported this finding. One of the students responded as, *“The Performance Feedback and Monitoring Notebook helped me to become more conscious of my scores which lead me to strive harder for a higher grade.”*

The BGT-AT students viewed the PF&MN as “evidently” monitoring their performance, “highly reflective” of their performance and “encouraging” them to perform better in Physics. They agreed that the PF&MN is a means to monitor their performance, reflect on their performance and perform better in physics by fostering intrinsic motivation (Buckley et al., 2009). Additionally, students subjected to PF&MN view the monitoring intervention as an instrument for assessment and evaluation (Struyven et al., 2010). The intervention also prompted teachers to feel that PF&MN as portfolios stimulate students to reflect (Ocak & Ulu, 2009).

Influence of Performance Feedback and Monitoring Notebook on Students' Performance

Table 4 presents the result of the survey conducted on the influence of the notebook on the seven areas of performance in Physics.

Table 4. Influence of PF&MN on the areas of performance in Physics (N = 59)

Influence Area	Weighted mean	Standard deviation	Interpretation of Influence
Attitude towards learning	2.45	1.508	Moderate Positive
Attitude towards teacher and classmates	3.10	1.485	Moderate Positive
Class performance	2.94	1.418	Moderate Positive
Concern for the use of technology in teaching and learning	2.36	0.978	Moderate Positive
Preparation for learning	2.70	1.497	Moderate Positive
Assessment of learning	3.59	1.758	High Positive
Concern for the extended use of the notebook	2.96	1.710	Moderate Positive
All areas	3.03	1.207	Moderate Positive

Table 4 shows that the PF&MN moderately influence the performance of the students in Physics in terms of attitude towards learning, attitude toward teacher and classmates, class performance, concern for the use of technology in teaching and learning, preparation for learning and concern for the extended use of the notebook. This result implies a positive change in each of these areas of performance, which may have been due to the ability of the PF&MN to provide feedback on the assessments they took in the course. Similarly, results in the studies of Mogonea (2015), and Demirel and Duran (2014), confirm that the students are able to monitor their scores in every examination, from where they may reflect within themselves to determine whether they learn the topic or not, and the students may also appreciate the effort of the teacher in providing them with feedback on their assessments. The notebook may have motivated the students to study harder and be able to prepare for the classroom activities by doing their assignments, become conscious of the benefits they got in using technology in teaching and learning, and

wanting to have the same notebook in other courses they are taking. The BGT-AT students rated the assessment of learning as a high positive influence. This result implies that the PF&MN profoundly influence the performance in Physics in the area of assessment of learning. The student who can monitor his or her scores in the assessments taken in the course becomes conscious of the examinations given to him/her. Being aware of the format and other aspects of examination like duration, frequency, and point allotment, the student can prepare for the examination. These analyses align with the results of Biggs' and Tang's (2011) study. The overall influence of the PF&MN is interpreted as a moderate influence. This result implies that the notebook moderately influences the overall performance of the students in Physics, proving that this notebook is a practical assessment portfolio (Mohktaria, 2015).

The general impressions of the students on the use of the notebook supported this result. Thirty-two percent (32%) of the students responded similarly to the response of one of them, *"It gives me an idea on how to improve in the subject this semester. It makes me strive for high grades through studying,"* that in using the notebook, they recognize their strengths and weaknesses, they plan to continue doing the right things they have done and change those activities that are not contributing positively to a better performance in Physics. Twenty-four percent (24%) of the students responded similarly, in verbatim (for one participant), *"Using Performance Feedback and Monitoring Notebook helps us to be concerned in our grades and overall performance to the room and the subject."* When they know their performance in the given assessment, they give time to prepare too their assignments, seat works, participate in the discussion and show concern for the ratings they obtain and become mindful in passing or failing the subject. Forty-two percent (42%) of the students responded similarly to the response of one of them, *"I am thankful for having this Performance Feedback and Monitoring Notebook because I am aware and informed about the result of my examination and I know when I am going to make up for my low scores."* The

students became concerned with the examinations and the results of the efforts they put in the assessments.

The PF&MN has a moderate positive influence on the performance in Physics of BGT-AT students. These results support the indication made by Biggs and Tang (2011) on the capability of the portfolio to increase student's learning, the study of Lee, Yeh, Kung and Hsu (2007) that learning attitude affects student's examination scores. It likewise agrees with the studies of Demirel and Duman (2014), and Mogonea (2015) that the use of portfolio had a positive effect on students' achievement. The students had a positive attitude towards learning the subject in general, the portfolio made their learning meaningful and helped them to learn better, and Buckely and colleagues (2009) identified the main effects of the use of portfolio, two of which are the improvement of student knowledge and technology integration.

Conclusion and Recommendations

This study aimed to determine the effect of using the Performance Feedback and Monitoring Notebook (PF&MN) as assessments on the views of the students on the use of the notebook, the influence of the notebook on the areas of performance, and the achievement in Physics.

The students viewed the use of the PF&MN as evidently monitoring their performance, highly reflective of their performance, and encouraging them to perform better in Physics. The students were able to monitor their performance in Physics with their recorded scores in the notebook, they were able to reflect on their performance in every assessment they took, and they were motivated to perform the tasks assigned to them. All of these may have led to better performance in the subject.

The PF&MN has influenced the students' performance in Physics in the areas of "attitude towards learning, attitude towards the teacher and classmates, classroom performance, concern for

the use of technology for teaching and learning, preparation for learning and concern for the extended use of the notebook,” and high positive influence in the area of “assessment of learning.” This result implies that when a student is knowledgeable of his or her performance throughout the course, coupled with constructive feedbacks, the attitude of the student becomes more positive influencing his or her performance in the subject.

There was an increase in the achievement of the students in Physics taught using PF&MN during assessments. The use of PF&MN may have enhanced the achievement of the students. A student who knows his/her performance, monitors and reflects from it becomes motivated to perform better in the subject. This result implies that the PF&MN, an assessment portfolio, when properly utilized, could enhance the achievement of the students.

This study was able to probe the effect of using Performance Feedback and Monitoring Notebook (PF&MN) during assessments on the attitude of the students that leads to positively influencing their learning performance, the views on the use of the notebook in terms of monitoring performance, reflecting on his/her own performance and its ability to encourage them to perform better in Physics. The general impressions of the students on the use of the PF&MN reflected the influence of the notebook on their performance in physics and could have caused a significant change in their achievement.

With these results, the teacher must be conscious in providing constructive feedback to the students, keep a record of the accomplishments made available to the students at all times, and allow the students to assess their performance in the course.

This study was conducted on a small group of technology students in Physics 1A (Mechanics). To further validate the results in this study, it is recommended that this study be conducted in a broader group of participants, on other science courses and different programs like engineering, education, or liberal arts.

Feedbacks utilized with this notebook are in written form only, but feedbacks can be done orally or demonstratively. Further researches aligned with this study can be on the ability and effectiveness of the notebook to provide the necessary feedback in the classroom. Feedback methods as characterized by Mounce (2014) vary in timing, amount, mode, audience, and contents. The feedbacks provided with the notebook can also be explored along with these characteristics.

...

References

- Axton, K. J. (2012). The role of portfolios in student motivation. *Vision*, 42, 23-42 Retrieved from: https://www.google.com.ph/search?ei=s6B2WtnlCcm60gTJmKuIB-g&q=portfolio+and+motivation+to+learn&oq=portfolio+and+motivation+to+learn&gs_l=psy-ab.3..33i21k1.14103.18245.0.19265.19.15.0.0.0.0.589.1660.2-1j1j1j1.4.0....0...1.1.64.psy-ab..15.4.1660...0i22i30k1.0.RL6-hyoXwns.
- Biggs, J., & Tang, C. (2011) Effective teaching and learning for today's universities. *Teaching for Quality Learning at University*, 4th Ed. McGraw Hill, Society for Research into Higher Education and Open University Press: New York. USA. Retrieved from: http://hust.edu.oak.arvixe.com/media/197963/-John_Biggs_and_Catherine_Tang-Teaching_for_Quali-BookFiorg-.pdf.
- Brookhart, S. (2017). Feedback: The long view – does feedback improve learning? *How to give effective feedback to your students*, 2nd ed. Retrieved from <https://k12teacherstaff-development.com/tlb/using-feedback-to-motivate-students-in-the-classroom/>.

- Buckley, S., Coleman, J., Davison, I., Khan, K.S., Zamora J., Malick, S., Morley, D., Pollard, D., Ashcroft, T., Popovic, C., & Sayers, J. (2009). The educational effects of portfolios on undergraduate student learning: A Best Evidence Medical Education (BEME) systematic review. *BEME Guide No. 11*. Retrieved from: <https://www.ncbi.nlm.nih.gov/pubmed/19404891>.
- Cakan, M., Mihaladiz, G., & Gocmen-Taskin, B. (2010). How portfolio use affects students' learning and their attitudes toward 6th grade science lesson. *International Online Journal of Educational Sciences*, 2(2), 362-377. Retrieved from https://www.researchgate.net/publication/45258403_How_Portfolio_Use_Affects_Students'_Learning_and_Their_Attitudes_toward_6th_Grade_Science_Lesson.
- Demirel, M., & Duman, H. (2014). The use of portfolio in English language teaching and its effects on achievement and attitude [Abstract]. *Procedia Social and Behavioral Sciences*. Retrieved from <https://www.sciencedirect.com/science/article/pii/S187704281502858X>.
- Lee, C., Yeh, D., Kung, R., & Hsu, C. (2007). The influences of learning portfolios and attitudes on learning effects in blended e-learning for mathematics. *Journal of Educational Computing Research* 37(4): 331-350. Retrieved from <http://journals.sagepub.com/doi/abs/10.2190/EC.37.4.a>.
- Mogonea, F. (2015). Portfolio – tool for (self) evaluation of students – future teachers. *Procedia – Social and Behavioral Sciences* 180: 860-864. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1877042815015736#!>.
- Mokhtaria, L. (2015). The use of portfolio as an assessment tool. *International Journal of Scientific & Technology* 4(7):

170-172 Retrieved from <http://www.ijstr.org/final-print/july2015/The-Use-Of-Portfolio-As-An-Assessment-Tool.pdf>.

Norman, S. (2016). *7 Benefits of technology integration in the education sphere*. Retrieved from <https://elearningindustry.com/benefits-technology-integration-education-sphere>.

Mounce, M. (2014). *Providing effective feedback. Educational theory and practice*. Retrieved from <http://edtheory.blogspot.com/2014/04/providing-effective-feedback.html>.

Ocak, G., & Ulu, M. (2009). The views of students, teachers and parents and the use of portfolio at the primary level [Abstract]. *Procedia Social and Behavioral Sciences*. 1(1): 28-36. DOI: 10.1016/j.sbspro.2009.01.009.

PLB Blogger. (n.d.) Using feedback to motivate students in the classroom. *Professional Learning Board – Online Teacher Relicensure and PD Courses*. Retrieved from <https://int.search.myway.com/search/GGmain.jhtml?searchfor=Using+feedback+to+motivate+students+in+the+classroom&n=784866b8&p2=%5ECPP%5Exdm204%5ET-TAB02%5Eph&ptb=CF464DEC-39BE-476D-B5FA->.

Provasnik, S.(2016). Trends in International Mathematics and Science Study. *National Center for Education Statistics*. NCES 2017002. Retrieved from <https://nces.ed.gov/timss/>

Provasnik, S.(2016). Trends in International Mathematics and Science Study. *National Center for Education Statistics*. NCES 2017002. <https://nces.ed.gov/timss/countries.asp>.

Reflection in the Classroom. *Center for New Designs in Learning and Scholarships*. Retrieved from <https://commons.georgetown.edu/teaching/teach/reflection-in-classroom/>.

Sanders, A. (2019). Approaches used to monitor classroom performance. *Classroom*. Retrieved from <https://classroom>.

synonym.com/approaches-used-monitor-classroom-performance-7854918.html.

Stenger, M. (2014). 5 Research-based tips for providing students with meaningful feedback [Supplemental Material]. *Edutopia*, George Lucas Educational Foundation. Retrieved from <https://www.edutopia.org/blog/tips-providing-students-meaningful-feedback-marianne-stenger>.

Struyven, K., Dochy, F., & Janssens, S. (2010). Students' perception about evaluation and assessment in higher education: A review. *Assessment and Evaluation in Higher Education*. 30(4), 325-341 Retrieved from <https://www.tandfonline.com/doi/abs/10.1080/02602930500099102>

The Glossary of education reforms: *Portfolio*. Retrieved from <http://edglossary.org/portfolio/>. Use of technology in teaching and learning. *U.S. Department of Education*. Retrieved from <https://www.ed.gov/oii-news/use-technology-teaching-and-learning>

UN-DESA (2015). Transforming our world: the 2030 agenda for sustainable development. *United Nations: Department of Economic and Social Affairs*. Retrieved from <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>

Victoria (2016). 4 Benefits of monitoring student progress in the classroom. *The Chalkboard Blog*. Retrieved from <https://www.teachstarter.com/blog/4-benefits-monitoring-student-progress-classroom>.

Villasis, M. (2018). *The effects of Polya's problem solving Strategy (PPSS) on students' achievement and conceptions in chemistry*. Unpublished Master's Thesis, Technological University of the Philippines – Manila.

Ways to monitor a student's progress (06 February 2017). *Ministry of Education, Guyana*. Retrieved from <http://www.ed->

ucation.gov.gy/web/index.php/teachers/tips-for-teaching/
item/2611-ways-to-monitor-a-student-s-progress

Yusuf, J., & Tuisawau, P. (2011). Student attitudes towards the use of e-Portfolios: Experiences from the University of the South Pacific. *Malaysian Journal of Educational Technology*, 11(4), 31-41.

Appendices

Appendix A

Table of rating and interpretation of the views survey on the use of PF&MN.

Rating	Assigned Score	Range of Agreement	Interpretation		
			Monitoring Performance	Reflecting on Performance	Performing Better in Physics
SA (Strongly Agree)	4	3.25 – 4.00	Highly Evident	Highly Reflective	Highly Encouraging
A (Agree)	3	2.50 – 3.24	Evident	Reflective	Encouraging
D (Disagree)	2	1.75 – 2.49	Uncertain	Non-reflective	Discouraging
SD (Strongly Disagree)	1	1.00 – 1.74	Highly Uncertain	Highly Non-reflective	Highly Discouraging

Appendix B

Interpretation table on the influence of PF&MN

Change Score	Change Description	Range of Weighted Mean Score	Interpretation
+5	Very High Positive	+4.09 to +5.00	Very High Influence
+4	High Positive	+3.18 to +4.08	High Positive Influence
+3	Moderately Positive	+2.27 to +3.17	Moderate Positive Influence
+2	Low Positive	+1.36 to +2.26	Low Positive Influence
+1	Very Low Positive	+0.45 to +1.35	Very Low Positive Influence
0	No Change	-0.44 to +0.44	No Influence
-1	Very Low Negative	-1.35 to -0.45	Very Low Negative Influence
-2	Low Negative	-2.26 to -1.36	Low Negative Influence
-3	Moderately Negative	-3.17 to -2.27	Moderate Negative Influence
-4	High Negative	-4.08 to -3.18	High Negative Influence
-5	Very High Negative	-5.00 to -4.09	Very High Negative Influence
