Determining Students' Learning Outcomes in Basic Education: A Proposed CPD for Teachers

Cecilia Junio-Sabio, Monaliza M. Manalo, and Florinda G. Vigonte

***Abstract*—This paper concerns the learning outcomes of the students' in basic education in the subjects Science and Mathematics as a basis for a proposed Continuing Professional Development (CPD) for teachers in Diliman Elementary School (DES) in the Philippines. It employs document analysis of the Mean Percentage Score (MPS) of the National Achievement Test results for a five-year period from 2013-2018. Results show that learning outcomes in Science per Grade/Level is increasing as reflected by their mean of 78.82, 80.22, 81.01, 81.71, 81.92, and 82.30 respectively but per school year, the result was generally declining. For Mathematics, learning outcomes vary. It can be noted that there is an increase in performance for Grades I, II, IV and V. However, learning performance for Grades III and VI decreases. As per School Year (SY), learning outcomes in Mathematics reported a diminishing pattern, aggregate performance decreases as the year progresses. It can be safely concluded from the results of the study that learning outcomes in basic curriculum is declining as time advances. A Continuing Professional Development (CPD) Plan was proposed and highly recommended for implementation.**

***Index Terms*—Basic education, continuing professional development (CPD), learning outcomes, teachers.**

I. Introduction

According to Bayocot (2014) [1], teachers have certain duties and responsibilities to perform that support the vision and mission of the Department of Education. He posited that the core objective of any educational system is to promote teaching-learning process; therefore, the main accountability of teachers is to facilitate learning process. Teachers are honored and expected to act in a manner deserving of public trust because of their important role in education. "With learners at the center, teaching serves as the most important means of awakening and nurturing the learners' interest and learning potentials."

Teachers should see themselves as capable of achieving the dimensions of good teaching to be able to achieve effective teaching and productive learning. Classroom teachers think about a balance teaching activities in the classroom with crucial professional upgrading activities. They also think which skills to teach, what teaching strategies to use, what enrichment activities and what learning experiences to provide.

It is widely recognized that "effective teachers constitute a valuable human resource for schools – one that needs to be treasured and supported" (Darling Hammond, 2013, p. 7) [2]. Like the members of other professions, teachers and education support staff need to be constant learners who see their own learning as being primary to membership of the profession rather than something that is incidental or optional. Udani (2012) [3] opined that Continuing Professional Education (CPE) in one's profession is indicative of a person's genuine concern for his present and future work.

According to Porter et al, (2013) [4] the content of teachers' professional development included targeting improvements to content knowledge, pedagogical strategies, alignment of curriculum and assessment, and a range of other topics. Similarly, Borko's (2004) [5] description of the myriad of contexts for teacher learning makes obvious the challenges of identifying and measuring teacher learning:

For teachers, learning occurs in many different aspects of practice, including their classrooms, their school communities, and professional development courses or workshops. It can occur in a brief hallway conversation with a colleague, or after school when counseling a troubled child. To understand teacher learning, we must study it within these multiple contexts, taking into account both the individual teacher-learners and the social systems in which they are participants. (p. 4)

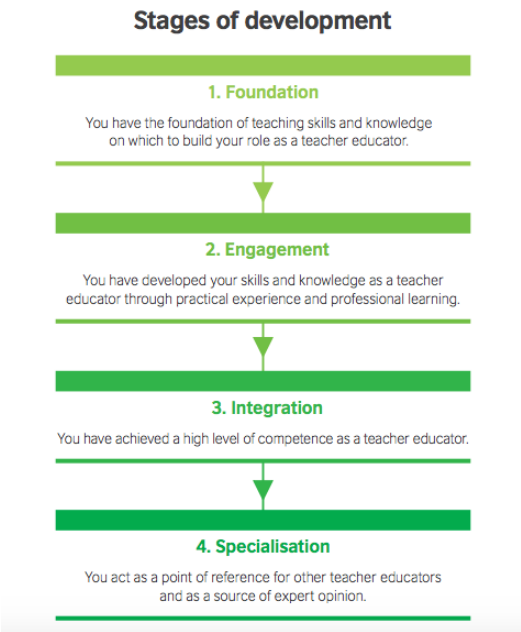

Fig. 1. CPD framework for teacher educators [6].

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The British Council (2017), published a Continuing Professional Development (CPD) Framework for teacher educators. The main substance of the publication includes the stages of development, professional practices, enabling skills and self-awareness features. There are four stages of development which includes foundation, engagement, integration and specialisation. Foundation includes knowledge of the subject matter and teaching skills. Engagement refers to the developed skills through practical experience. Integration is characterized by high level of confidence being a teacher educator. Lastly, specialization is described as being a source of expert opinion. The present study operated on these four stages of development set by the British Council. CPD once anchored on this framework, the true essence of professional development may be maximized. Fig. 1 depicts the theoretical framework of this study.

Fig. 1 shows the research paradigm which serves as a guide to the professional development of all those involved in the education and training of teachers.

In the Philippines, Section 2 of the "Philippine Teachers Professional Act of 1994", provides for the policy of the State to regulate and professionalize the practice of teaching, to wit:

"The State recognizes the vital role of the teachers in nation-building and development through a responsible and literate citizenry. Towards this end, the State shall ensure and promote quality education by proper supervision and regulation of the licensure examination and professionalization of the practice of the teaching profession" [7]

Later on, Republic Act (R.A.) No. 10912 or the "CPD Act of 2016" was enacted. It promotes and upgrades the practice of the profession in the country and institute measures that will continuously improve the competence of the professionals in accordance with the international standards of practices, thereby, ensuring their contribution in uplifting the general welfare, economic growth and development of the nation [8].

The terms staff development, in-service, and professional development are often used interchangeably, and professional development is used to describe all of these categories of training. Professional development focuses on knowledge, skills, and attitudes required of teachers, administrators, and other school employees that are directed toward all students learning at high levels of achievement (McClure 2014 [9]).

Nevertheless, students learning at high levels of achievement seems questionable due to the alarming decline in students' learning outcomes. In an article by Ronda (2011) [10] he stated that according to DepEd, the students' achievement rates in the Basic Education are declining. Education Secretary Armin Luistro [11] spoke about this matter during the National Education Summit held at the Shangri-La Hotel in Makati. The purpose of the education summit is to give education stakeholders the state of basic education, higher education and technical-vocational education in the country. He presented graphs showing a downward trend representing achievement levels and survival rates of elementary and high school students. The graphs were part of his report on the state of basic education at the National Education Summit. Based on National Achievement Tests (NAT) results from 2005 to 2010, DepEd records showed a declining achievement level of elementary and high school students. NAT results of high school students from 2005 to 2010 showed that the mean percentage score (MPS) of students dropped from school year 2007-08, which posted an MPS of 49.26 percent, to 47.40 percent in 2008-09, and down to 46.30 percent in 2009 to 2010.

For the elementary achievement test results, negligible gains were made with low MPS results of 64.81 percent in 2007-08, 66.33 percent in 2008 to 2009, and 69.21 percent in 2009 to 2010.

A. Statement of the Problem

Specifically, this study aimed to answer the following research questions: 1). What is the learning outcomes of the learners in basic education from the past 5 years in Science and Mathematics: (a.) per Grade/Level? (b.) per School year?

2). What Continuing Professional Education for teachers may be proposed to enhance students' learning outcomes?

II. Method

A. Research Design

This study employed the descriptive quantitative research design. It focuses on the learning status of the students by quantifying their learning outcomes through their performance in the National Achievement Test in Science and Mathematics. Document analysis was utilized in determining such learning outcomes.

B. Participants

Elementary pupils of Diliman Elementary School SY 2018-2019 were the respondents.

C. Instrument

Students' Learning Outcomes per Grade/Level and per School Year (SY) were taken from the School Consolidated Test Result from 2013-2018 by Mean Percentage Score (MPS). Permission were granted by the Schools' Division Superintendent, Supervisors, School Principal, teachers, parents and pupils under study.

D. Data Gathering Procedure

After the research ethics protocol was ensured, the researchers proceeded to look for the consolidated annual test results from Grades 1 to VI from SY 2013-2014 to SY 2017-2018. The results were recorded, compared, tabulated, and analyzed for further interpretation.

E. Statistical Treatment

Descriptive statistics are used to treat the data collected. Mean analysis was applied for the scores both in Science and Mathematics across Grade/Level and among School Years. Graphs were further utilized to show visual representation of the data collected.

III. Results and Discussion

A. Learning Outcomes of the Learners in Basic Education from the Past 5 Years in Science and Mathematics

TABLE I: Learning Outcomes in Science Per Consolidated Test Result for a 5-Year Period Measured by Mean Percentage Score (MPS) Per Grade/Level

Grade/Level	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	x̄
1	80.00	79.91	77.75	78.00	78.44	78.82
2	81.20	80.59	78.72	80.00	80.59	80.22
3	82.00	81.63	80.00	81.00	80.40	81.01
4	83.00	82.00	81.00	81.80	80.77	81.71
5	83.90	82.45	80.90	81.45	80.90	81.92
6	84.00	82.90	81.12	82.00	81.50	82.30
x̄	**82.35**	**81.58**	**79.92**	**80.71**	**80.43**	**81.00**

Table I shows the Students' Learning Outcomes in Science per Consolidated Test Result for a 5-year Period 2013-2018. It can be inferred that the Mean Percentage Score (MPS) per Grade/Level is increasing. As per school years, the MPS is fluctuating but can generally be described as decreasing as seen in the decrease in MPS of 82.35 for 2013-2014 down to MPS of 80.43 for SY 2017-2018. The table exhibits the students' performance in Science subject for five school years which shows a shift in the pattern which implies that their aggregate performance decreased, slightly increased and then decreased again but generally implies poor performance as the year progresses. It further exhibits the students' performance in Science subject per Grade/Level which shows a rising pattern. This implies that their aggregate performance regardless of school years becomes satisfactory as the Grade/Level advances.

TABLE II: Learning Outcomes in Mathematics Per Consolidated Test Result for a 5-Year Period Measured By Mean Percentage Score (MPS) Per Grade Level

Grade/Level	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	x̄
1	80.20	79.65	78.88	79.00	78.12	79.17
2	80.00	80.67	79.65	80.23	79.47	80.00
3	81.87	81.04	80.50	78.90	77.10	79.88
4	82.56	82.00	80.00	80.42	79.00	80.80
5	83.00	82.45	81.00	80.99	79.60	81.41
6	84.00	81.77	80.31	79.56	78.23	80.77
x̄	**81.94**	**81.26**	**80.06**	**79.85**	**78.59**	**80.34**

Table II shows the Students' Learning Outcomes in Mathematics per Consolidated Test Result for a 5-year Period 2013-2018. It can be inferred that the Mean Percentage Score (MPS) per Grade/Level varies. As per school years, the MPS is constantly decreasing from 81.94 in SY 2013-2014 down to 78.59 in SY 2017-2018. It exhibits the students' performance in Mathematics subject for five school years which shows diminishing pattern regardless of school year. This means that their aggregate performance decreases as the year progresses. The table also shows the students' performance in Mathematics subject per Grade/Level with fluctuating pattern and implies that their aggregate performance either increases or decreases as the Grade/Level advances.

Fig. 2 exhibits the students' performance in Science subject for five school years which shows a fluctuation in the pattern which implies that their aggregate performance decreased, slightly increased and then decreased again.

It can be gleaned from Fig. 2 that generally, the learning outcomes in Science imply a poor performance as the year progresses.

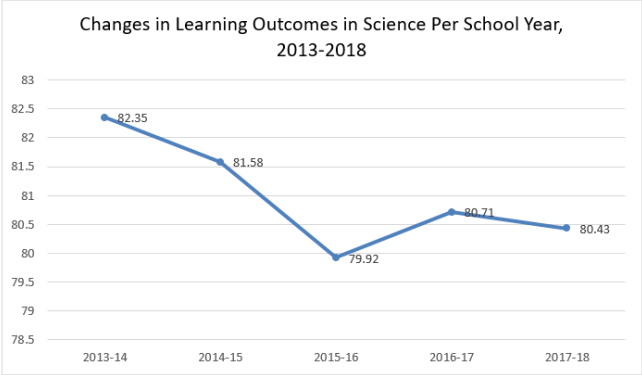

Fig. 2. Learning outcomes in science per school year.

The result gives a support to the claim of Secretary Armin Luistro (2011) that the students' achievement rates are declining as shown by the graph from the National Education Summit with a downward trend. It is also in congruence with the NAT result from 2005-2010 showing a declining achievement level of elementary students.

Fig. 3 presents the learning outcomes in Mathematics per School Year.

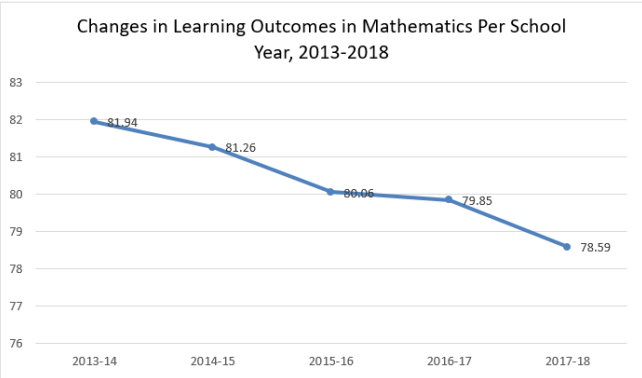

Fig. 3. Learning outcomes in mathematics per school year.

It can be inferred from Fig. 3 that the learning outcomes in Mathematics shows a diminishing pattern regardless of school year. Thus, aggregate performance decreases as the year progresses.

B. What Continuing Professional Education for Teachers May Be Proposed to Enhance Students' Learning Outcomes?

Results of the study show positive learning outcomes for Science per School Year (SY) per Grade/Level. Yet, in Mathematics, it becomes poorer and poorer as time moves forward. Similarly, Grades III and Grades VI needs to be given more attention since scores decline on those particular levels. Thus, the CPDs are proposed for teachers to enhance students' learning outcomes as shown in Table III.

Table III shows the proposed Customized Training Plan for Diliman Elementary School (DES) which is deemed to be responsive to the needs, both actual and perceived, by the teacher-respondents of the study.

TABLE III: CUSTOMIZED TRAINING PLAN FOR DILIMAN ELEMENTARY SCHOOL (DES) TEACHERS

I. Course/Program Title: **CUSTOMIZED TRAINING PLAN FOR DILIMAN ELEMENTARY SCHOOL (DES) TEACHERS**

II. Course/Program Brief Description: **The training plan is responsive; designed to cater the specific needs of DES teachers based on their given recommendations anchored on the training needs analysis conducted by the researcher.**

III. Proposed PQF level: 7

IV. Particular Continuing Professional Competency/ies: **Technology, subject matter content, skills and management**

V. Content Details:

Sub-Topics and Time Allotment for every topic	Area of CPD Activity	Expected Learning Outcomes	Activities to Achieve Learning Outcomes	Assessment Strategies including, Assessment Tools	Requirements /Outputs
ICT Skills for Teaching (May 2019)	Professional/Ethics	Utilize ICT skills commonly used by teachers like Microsoft Office and completion of sample online forms required by DepEd. Use ICT in improving students' motivation towards learning particularly in English, Science and Mathematics	Lecture-Discussion Hands-on Training Workshop Oral Participation	Pre & Post Test	Test Result
Student Discipline and Behavior Problems (September 2019)	Ethics	Identify appropriate procedure in dealing with students' misbehaviors	Lecture-Discussion Group Activities Demonstration	Actual Demonstration	Action Plan in Establishing Appropriate Procedure for Students' Misbehavior
School Management (October 2019)	Professional	Manage school operations relevant to the daily work of the teachers.	Lecture-Discussion Workshop Demonstration Oral Participation	Oral Reporting Demonstration Written Output	Updated and functional Organizational Chart
Student Counselling (October 2019)	Professional	Highlight the importance of teachers as counselors to their students focusing on improving low academic performance in English, Science and Mathematics	Lecture-Discussion Workshop Oral Participation	Pre & Post Test	Test Result

VII. Financial Projection:

A. Expected Number of Participants: **15**

B. Proposed Charge per Participant: **NONE.** Expenses will be taken from School Maintenance and Other Operating Expenses

C. Relevant Details in Support of the Financial Viability of the Program

IV. CONCLUSION

Based on the Consolidated Test Result for a 5-Year Period Measured by Mean Percentage Score (MPS) from the National Achievement Test of the Basic Education Elementary pupils, it can be safely concluded that learning outcomes in Science per grade/level gets better but generally gets poorer per school year while learning outcomes in Mathematics vary per grade/level and decrease per school year. Henceforth, schools should take into consideration improving this result by aligning their CPD efforts in improving learning outcomes of students. Teachers should therefore take appropriate steps in providing teaching-learning processes that will improve students' learning outcomes in Science and Mathematics as the ultimate test of effective teacher's performance is a positive learning outcomes of students.

V. RECOMMENDATION

Grounded on the findings of the study, it is highly recommended that the proposed CPD Training Plan for Teachers be implemented.

CONFLICT OF INTEREST

"The authors declare no conflict of interest".

AUTHOR CONTRIBUTIONS

Monaliza M. Manalo conducted the research; Dr. CJ Sabio analyzed the data; Florinda G. Vigonte wrote the paper; ...; all authors had approved the final version.

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