International Journal of Education and Psychological Research (IJEPR) Volume 7, Issue 3, September 2018
Print - ISSN: 2349 - 0853, e-ISSN: 2279 - 0179 Available online at www.ijepr.org
Orignal Research Article Open Access

Peer2peer Learning Among Youth (PLAY): An Innovative Initiative in a Rural Elementary School in India

S. Rangarajan[1]

Abstract:

This paper presents a unique and universal scheme to improve the performance of every student. We present a recent case study conducted in a rural elementary school located in the outskirts of Bangalore, India. It is shown how the scores in one topic of mathematics among a class of 10 students showed a drastic improvement when a student who understood the problem better explained the procedure to his classmates. It is proposed that researchers study the effectiveness of this component as an aid in improving the learning outcomes of students in schools especially in remote areas, especially since this scheme does not require any additional costs.

Keywords: *Peer-teaching, Peer-leaning, Student Teachers, Elementary school, Rural, Mathematics*

Article History: *Received: 17th August 2018, Revised: 22nd September 2018, Accepted: 28th September 2018, Published: 30th September 2018.*

I. GOALS AND OBJECTIVES

Education is a major driving force for the uplift of society. Sadly, however, millions of young people, particularly in remote regions of less developed countries, do not receive quality education. Providing quality education to all has traditionally been a difficult and expensive endeavor [1]. The challenges include: inadequate number of trained teachers, insufficient learning resources available to students and teachers, and poor local infrastructure. One needs to address teacher performance when dealing with the issue of quality of education. To this effect, studies show that the quality of education is strongly tied to the context of teachers' performance more so than the pupil to teacher ratio, curricular content, or school infrastructure. The teacher training programs tend to emphasize more on the content component and bombard teachers with facts or prescriptions to digest rather than training them to think of an alternative, innovative solution to try out when faced with stale situations on the job.

Yazmi has developed and implemented a satellite-based network in Africa to support teachers [2], by delivering good lesson plans and scripted teaching materials to them on a lesson-by-lesson basis, and through this scheme provide students personalized, yet instructor-led learning towards the goal of achieving quality education for all. The foundation of this context is grounded on developing, supporting and building teacher- teacher; student-student and student-teacher support systems as the fabric of the school's community. Of these aspects the role of student-student interactions particularly in a rural setting with no access to digital resources requires study in a controlled environment and its contribution assessed. The work of this paper is conducted in this context.

II. PEER TO PEER LEARNING

In the recent times "Peer to Peer" interaction and its role in learning have been emphasized, particularly in the context of higher studies as well as businesses. It recognizes that ultimately learning takes place between individuals and it facilitates interpersonal interchanges that are well matched and that are based on trust and commitment [3, 4]. It encourages likeminded learners to exchange knowledge and based on the fact that everyone is a teacher as well as a learner. When public schools perform poorly often for want of adequate teaching staff, peer-teaching could be a game-changer. It is also a welcome shift from the traditional methods of learning where the weaker students tend to lag, as the focus is on finishing the syllabus rather than on ensuring that every student gets the learning objectives right. Generally, peers are other people in a similar situation to each other who do not have a assigned role in that situation as teacher. It is known that the first approach, when stuck on a problem, is normally to ask another student, not the teacher. Yet not much literature is available on the effectiveness of peer learning, especially at the primary school level. The problem is accentuated by the fact that peer learning is a slow and ongoing process and isolating its contribution to the overall results is difficult. Also, there is no "one shoe fits all" and so generalizing from a particular case study is not easy.

Peer2peer Learning Among Youth (PLAY) is an innovative approach to involve the students in the teaching-learning process. This scheme is not meant to diminish the role of teachers in any way and is meant to supplement their work. It is believed that if the effectiveness of PLAY is properly understood and gauged, the overworked teachers may take advantage of PLAY in their student management. When students turn into teachers, they have a greater motivation to learn the concepts correctly and deeply. Furthermore, when they are asked to teach what they learnt only the other day, the learning of the concepts get reinforced and their own performance potential in the exams improves. This is a sure way of bringing back students' interest in learning fundamental concepts. The students have a better awareness

[1]Technical Consultant, YAZMI USA LLC, Email: srangarajan@yazmi.com

in the difficulties faced by their peers and they can get across a concept/technique to their peers in a language that would help them. Having acquired this knowledge they can, in turn, pass the concepts on to other students in the school, and eventually in other schools.

III. THE TARGET GROUP

Sai Krushna Vidya Mandir (SKVM) is a higher elementary school located in Hosadoddi village about 20 kms south of Bangalore, Karnataka State, India. It presently offers classes 1-7 in English-medium to the nearby village children, the parents of whom are mostly farmers/household workers and have never been to a school. The education is completely free and a nutritious midday meal is a bonus for the children. There are about 200 students and 10 teachers in the school. The school is implementing an integral model of education that emphasizes the all round development of the child through not just the prescribed curriculum, but also physical, social, environmental and spiritual modules that provide opportunities for the children to flourish and thrive and, in turn, bring about positive changes in their own homes and villages.

The leading class of the school is Standard VII, which has just 10 students. Even though the sample size is small for drawing statistically significant results, it was decided to use this group for initial impact of PLAY on learning outcomes. Some of these students by their seniority are leaders of the "houses" in the school and are used to leveraging the strengths of individuals in team games like Volley Ball. The school has been encouraging the concept of PLAY in activities like English Reading/Speaking and Comprehension, which are challenging tasks in these rural environments with practically no support at home and no exposure to media. Teams are formed with each leader being more proficient in that sphere than his teammates, but the team scores only when all the members reach a certain level of proficiency and the onus is on the leader of the team to bring up the standard of his teammates.

Is it possible that these SKVM students can indeed step into their teacher's shoes? Can they be used to test the effectiveness of peer teaching? Yazmi firmly believes in this approach and would like to investigate the effectiveness of PLAY by some simple case studies at SKVM.

VI. THE FRAMEWORK

The school conducts monthly unit tests in each subject. The table below lists the performance of the 10 students of VII standard in the second unit test in Mathematics held in mid August 2018. The students (their names suppressed) label the rows, the columns label the questions and the cells show how each student fared in each question. There is wide variance in the class performance.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Total
Topic-->	Covertbn. Units (decimal)	Equivalent Fraction	Fractions on Number Line	Ordering Rational Numbers	Add Rational Numbers	Multiply Rational Numbers	Terminating or Recurring?	Division of Decimals	Supplementary Angles	Simple Equations	Algebra-1	Statements sums	Out of 25
S1	1.00	0.00	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.75
S2	1.00	1.75	2.00	1.00	1.00	1.50	1.00	1.00	1.00	2.00	1.00	1.00	15.25
S3	4.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	0.50	2.00	2.00	4.00	23.50
S4	2.00	1.50	0.50	0.50	0.00	0.50	1.00	0.50	0.50	2.00	1.00	3.00	13.00
S5	1.00	1.50	2.00	1.00	1.50	1.00	1.00	1.00	0.00	2.00	1.00	0.50	13.50
S6	3.00	1.00	0.25	0.50	1.50	1.50	0.50	0.50	0.00	2.00	0.00	1.00	11.75
S7	0.50	1.50	1.75	1.00	1.50	0.50	0.00	0.00	0.50	0.00	0.00	0.00	7.25
S8	0.50	1.50	1.75	0.50	1.50	1.00	0.00	0.50	1.50	0.00	0.00	1.50	10.25
S9	3.00	1.00	0.25	0.50	1.50	1.50	0.50	0.50	0.00	2.00	0.00	1.00	11.75
S10	1.00	2.00	1.75	0.00	1.50	1.00	0.00	0.00	0.50	0.00	0.00	0.00	7.75
Class average	1.70	1.38	1.40	0.60	1.20	1.05	0.50	0.50	0.45	1.20	0.50	1.20	
Max marks	4.00	2.00	2.00	1.00	2.00	2.00	1.00	2.00	1.00	2.00	2.00	4.00	25.00
% performance	42.5%	68.8%	70.0%	60.0%	60.0%	52.5%	50.0%	25.0%	45.0%	60.0%	25.0%	30.0%	

For this study it was more important to pick a question in which there is a large variance in the student scores. Q1 and Q12 had large standard deviations. It was decided to pick Q1 for the PLAY approach and Q12, which involved more of English comprehension was left to the teacher to work on.

V. RESULTS AND DISCUSSION

The mean score on Q1 is 1.7 with a standard deviation of 1.23. The topic for this question relates to converting from one unit to another in the metric system. For example, m to cm; m to km; g to kg; g to mg; mm to m etc. It was found that all the 10 students knew the conversion table based on the prefix like milli, centi, kilo etc. While attempting the problems under Q1, the majority of the class used decimal multiplication/ division in the long form, 1.e. digit by digit. This often resulted in mistakes in alignments and wrong final answers.

The approach of student S3 was refreshingly different. He approached the conversion in two steps, first by figuring out whether the resulting number will be greater than or less than the quantity on the left. This inference is based on whether the unit on the right is less than or greater than the unit on the left. Thus while converting 1.25 cm to mm, it was realized that mm is a smaller unit than cm and so while measured in mm the quantity will be larger than when measured in cm. It is also known that the conversion between cm and mm is a factor 10. In decimal system the quantity on the right is therefore obtained by shifting the decimal point one place to the right, yielding 12.5 mm. Likewise, dividing by 10 or 100 or 1,000 is just a shift of the decimal point to the left by 1, or 2 or 3 places, respectively.

The student S3 was given 30 minutes explain this 2-part technique to the remaining 9 students. A test was conducted for all the students the next day with 8 new problems identical in the degree of complexity of the test questions. The class average rose from 1.7 to 3.75 and the standard deviation decreased from 1.23 to 0.42.

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Class average	Standard Deviation
Pre-PLAY	1	1	4	2	1	3	0.5	0.5	3	1	1.7	1.23
Post-PLAY	3	4	4	4	4	4	4	3.5	4	3	3.75	0.42

This clearly demonstrates the effectiveness of "peer to peer" teaching and learning among these young children. The students can indeed don the role of teachers in a near real time manner if properly guided and motivated. Disadvantaged students have a greater chance of making it right in this mode as it is one-on-one, and also student-to-student.

It is noted that more often than not, a student does one problem right and falters in another and this performance is reversed for another student. By a PLAY scheme they both can do both the problems right, both have learnt by this "barter" scheme and the teacher would be happy that the overall performance of the class improves.

However, this is only a first such experiment and that too on a small class size of 10. Hence the results are taken as indicative rather than conclusive. Also, it is realized that PLAY won't work for all topics and would like to build the capabilities for topics like Q8 or Q11 through the teacher and/or teaching aids. It is planned to continue with this approach for a few other classes, subjects and possibly other schools to generate more inputs for the education technologists. In conclusion, it is stated that learning is a complex process and if our goal is to improve the learning outcomes uniformly, we need to build in several components and one of them could be PLAY as introduced in this paper.

VI. REFERENCES

1) Education Commission, "The Learning Generation: Investing in Education for a changing world" (2018).
2) S.Rangarajan, "Satellite-Based Education System: Unparalleled Reach, Direct Delivery, Infinite Scalability, Built-In Feedback" Presentation at eLearning Africa conference, Kampala (2014).
3) Lane F. Donnelly, David B. Larson, Richard E. Heller III, and Jonathan B. Kruskal, " Practical Suggestions on How to Move From Peer Review to Peer Learning", American Journal of Roentgenology Page 578-582 (2018).
4) Marieke Thurlings & Perry den Brok, "Student teachers' and in-service teachers' peer learning: a realist synthesis, Educational Research and Evaluation", Educational Research and Evaluation: An Int. J of Theory and Practice (2018).