OUTCOME BASED CLOSED LOOP TEACHING LEARNING PROCESS: A CASE STUDY

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Abstract

Teaching - learning process is evolving continuously from ancient times to modern era of customized expectation. The expectation is outcome based learning, but the ongoing class room practice is input based open loop teaching- learning process, i.e. one way input by the teacher which is ultimately dependent on the learner to reciprocate. The world has changed in all aspects, including technology, lifestyle etc.; but since there is no significant evolution in the classroom teaching- learning process, the need of the hour is to undergo seismic change in the field of teaching learning process and venture towards new ways of teaching- learning strategies. This paper proposes outcome based closed loop model of teaching learning process by utilizing class attendance time, which can be a way out, with potential of delivering value-added teaching learning program to the heterogeneous population of a class. The closed loop system of teaching learning process aims to inculcate, competitive urge, multi-tasking ability among learners, writing practice among pupils, the habit of recalling, time management practice, transformation of learner's mind from leisurely to the learning environment, by utilizing the unproductive time which goes waste in the course of taking attendance. This method has been experimented over the last four years, over a wide range of students and as per the feedback received from a survey, the methodology narrated above, proved to be quite successful and the pupils have been able to figure out drastic changes in their performance through active participation in class room teaching- learning process, with improved outcome.

Keywords: Current teaching- learning process, closed- loop system, Attendance time, enhanced outcome.

Introduction

A class of pupils is always heterogeneous in nature. Each student is different with different potential, learning ability and understanding or grasping power. Some are fast learners and are capable of understanding facts quickly and easily, sometimes even before the teacher explains. On the contrary there are other students who need special care, attention and most importantly time for digesting the facts clearly. As a teacher, it is one's duty to explore individual differences [1] in terms of learning potential and effort must be given to cater all the learners of the heterogeneous population of a class. Now, if a medical practitioner provides the same treatment to all the patients, where the demand is different for all, and if cure is expected, it is practically impossible. In order, that the patients get diagnosed effectively and completely, the suitable treatment needs to be given, for enhancing the outcome of diagnosis.

One of the most unproductive time, in the classroom teaching process is the time spent for taking attendance. This should not be mistaken as; attendance is not important or so.

Undoubtedly, attendance is an integral part of the teaching- learning process, in order to keep a track of the attendees and keep a check on regularity of the pupils. But usually in a class of an average of 50 to 60 learners, about 5 to 7 minutes of the total class time, is devoted for taking attendance. This time duration is quite unproductive with no value addition in the knowledge base. Generally pupils take this time to be a leisurely period, where they are mentally absent, as the class learning is about to start.

Revolution is taking place day by day in all sectors. Current higher education in India did not meet the expected standard [2] and hence implementation of pedagogy is needed to bring it up to par with that of developed nations. Digitization has captured everybody's attention. Due to the thrust given on online teaching, the classroom teaching- learning model is at a stake. To overcome the challenge created by the online mode of teaching- learning, it is very important to innovate the current existing class room teaching- learning model, with customized value addition.

The hour demands construction of a social pedagogy [3], to develop a high quality group learning and co-learning which would be quite helpful and in the interest if the students. As per the guidelines of National board of Accreditation (NBA) [4], emphasis should be given on the outcome based programme and the same is followed during their accreditation too. Teaching is very often commented to be an art, but, teaching in itself is a science [5], which provides systematic solutions to the students, not served with the traditional education system. Continuous assessment by the teacher and self-assessment by the learner, at different levels in the course of the teaching learning programme are the most important pre-requisites for success of the programme [6]. The outcome based closed loop teaching learning process provides a clear picture in the weakness of the programme at different levels and also gives opportunity for immediate correction. All mentioned study focused on program outcome and course outcome but same is possible only if focus is given on each and every classroom outcome.

1.   Objectives of the study
Taking note of above narrated gaps in the current teaching- learning process, an outcome based, closed loop teaching- learning process is being proposed in order to improve the classroom outcome by utilizing attendance time, in a creative and efficient manner with multiple benefits coming up with a single self-assessment practice.

2.   Concept of closed loop education system
For better understanding of the closed loop system of education, the idea of existing open loop system should be clear at the first place.

The current existing education system is an open loop type of system, where the teaching-learning process is only input based. As per the usual practice, the teacher, after taking the attendance starts delivering the lecture. The students follow the lecture for about an hour, and subsequently the session ends. Is that all? ; Does the purpose of the class end here? The answer is no. Undoubtedly, the one sided task of delivering the lecture by the teacher must have been done in an excellent manner. But, was there reciprocation from the learners' end?

That is difficult to answer, without gauging the classroom outcome for the heterogeneous population. There may be gaps, sometimes considerable ones, between what was taught and what has been learned. By the time the teacher notices these gaps in learning, it is frequently too late to remedy the problems. The teacher being unable to track the learning taken by the students thereby leaves the loop of teaching- learning process, open. Moreover, the pupils are

assessed periodically, maybe monthly or quarterly or half yearly and yearly, through regular examination system, but by this time, it is too late for the teachers to judge the learners and this may end up to be fatal. To avoid such unhappy surprises, teachers and students need better ways to monitor learning throughout the learning period. Specifically, teachers and students need a continuous gauging of classroom learning with reference to earlier set target.

The outcome based, closed loop system of teaching- learning process is proposed to bridge the gap existing in the current learning system as mentioned above. In this system, learning loop is completed by addition of self-assessment loop, where the student is made to engage, in solving a small questionnaire, as the teacher takes attendance simultaneously. This additional activity intends to gauge the classroom learning outcome with further opportunity of immediate correction in the classroom itself. This practice intend to inculcate, the custom of recalling, multitasking ability, writing practice, creates a competitive urge in the students, enables enhancement of verbal as well as non-verbal, technical communication skills through speaking and writing and most importantly it gives an opportunity to the teacher to analyse the understanding of the learner and do the required course correction, i.e. completing the self-assessment loop and thereby establishing a closed loop teaching- learning system with increased outcome. This creates an environment of learning at the very beginning of the class which sets the tune for further proceedings of teaching learning.

The open and closed loop model of teaching- learning process is illustrated below in Fig. 1 and Fig. 2 respectively.
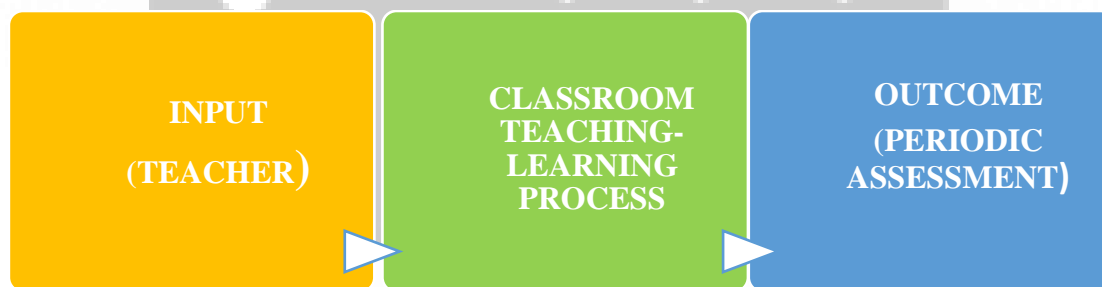
Fig 1: Open loop teaching- learning process model
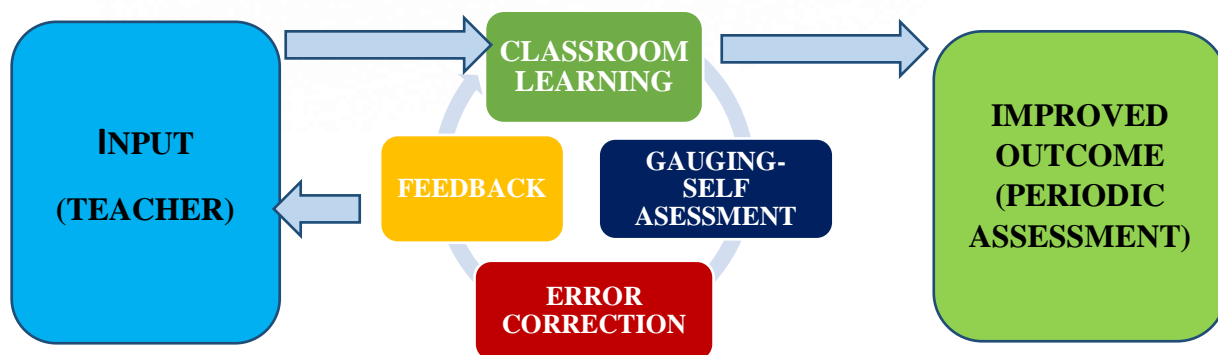
Fig 2: Closed loop teaching- learning process model

The main factor responsible to amplify the outcome produced by a learner is reciprocation from both ends, i.e. the teacher as well as the learner's end. In order to provide a solution to these voids existing in the current education system, a closed loop system, aiming at enhanced outcome is essential and should replace the current teaching- learning system as soon as possible in order to add effect to the outcome and performance of the learners.

3. Execution of closed loop education system in classroom by utilising attendance time

As narrated previously, the very less in duration, but the time where there is no value addition as far as learning is concerned, the attendance time can be converted into the most productive and outcome producing time, in the most creative manner.

In this duration, a questionnaire comprising a few questions (say 3 to 4 in number) can be supplied to the students, on the basis on previous teaching. Meanwhile, the students are busy writing down the solution to the questionnaire, the teacher can continue with the roll calls. At the same time when the student is concerned with answering the problems, attention has to be paid to answering the roll calls as well. Apart from that the mind is busy recalling the facts that need to be put down on the self-assessment sheet in writing. Thus, multiple senses of the learner are operational simultaneously. Here in, lies the basic advantage of the practice, which stimulates the functioning of multiple senses at a time, thereby developing multi-tasking ability among the students.

After completion of the attendance, the teacher can take a quick walk around the class in order to get an overview of the overall class participation and productivity. The final stage is the assessment. After the specified time duration of about 5 to 8 minutes, dedicated for writing the solutions to the questionnaire by the pupils, the teacher can correct the responses by random selection of students, who would get a chance to read out or speak out their words and a similar procedure is followed for the subsequent questions. This enables the teacher to understand the mind of, the class of heterogeneous learners and also reveals the statistics of the percentage of students, getting the correct learning. This gives an opportunity to the teacher to get real time feedback and also to rectify the errors that might have crept in, in the course of understanding the lecture sessions.

Thus evidently, the above narrated methodology is a complete package with a scope of all round development of an individual. If implemented properly, in a systematic manner, the system will prove to be a boon in building up teaching learning process, with enhanced outcome from the learners' end.

4. Survey result on closed loop teaching learning process

In order to have a check on the validity of the proposed methodology of closed loop teaching learning process, the system was implemented on trial basis on a diversified class of students belonging from Institute of Engineering& Management, Kolkata, for about 4 years and accordingly a survey was conducted in order to validate the set target. The survey has had participation from the alumni to the current batches, i.e. the learners who are still undergoing the process and also from those who have been a part of the process, and have been employed in some of the very reputed firms and organisations.

Mentioned below are some questions, along with the outcome of the survey, which were put to the students so as to enable them to put down their mind and voice out their opinion on the closed loop teaching learning system. The outcome of the survey includes the response in two parts, namely, overall responses (O) comprising the current batch and the alumni batch and the other response exclusively from the alumni batch (A).

1) Does this closed loop system help you to enter into the teaching learning process by utilizing the unproductive attendance time?
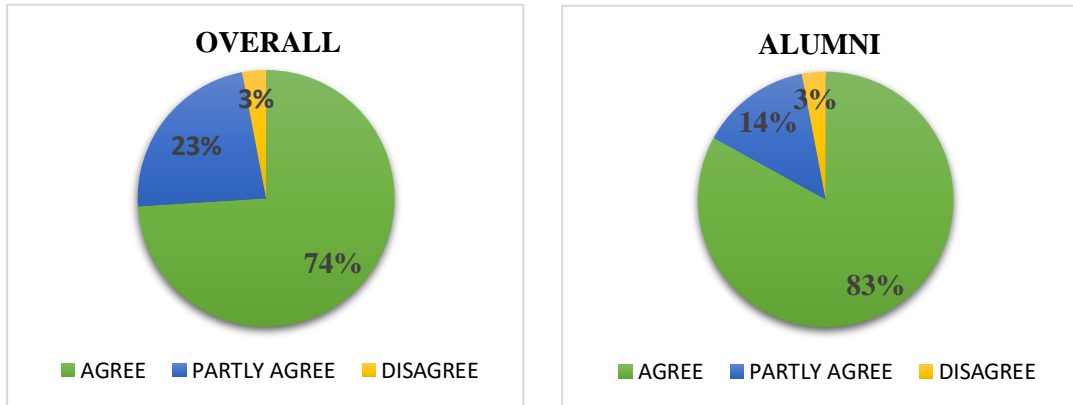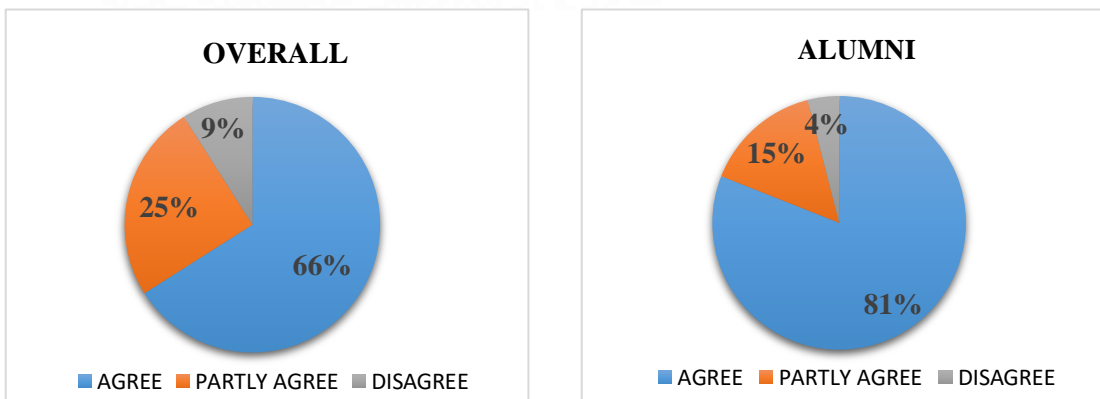

Fig 3: Response to attendance time utilisation

2) Do you think this approach is efficient enough to inculcate recalling practice, and better understanding of the facts?
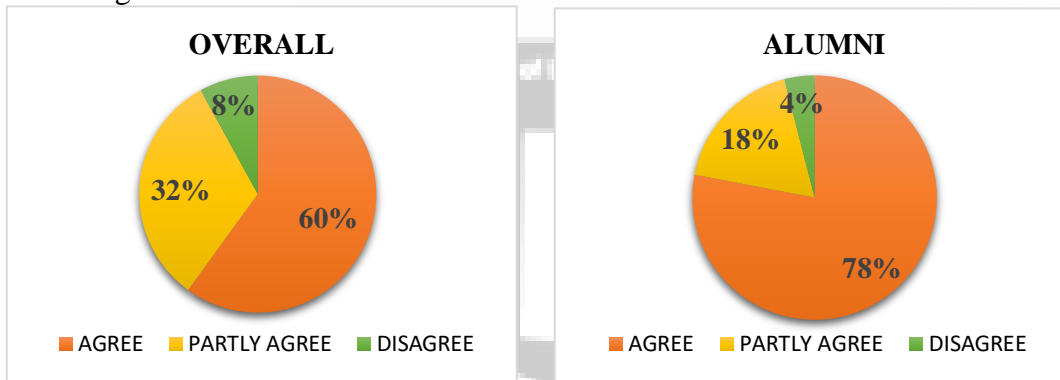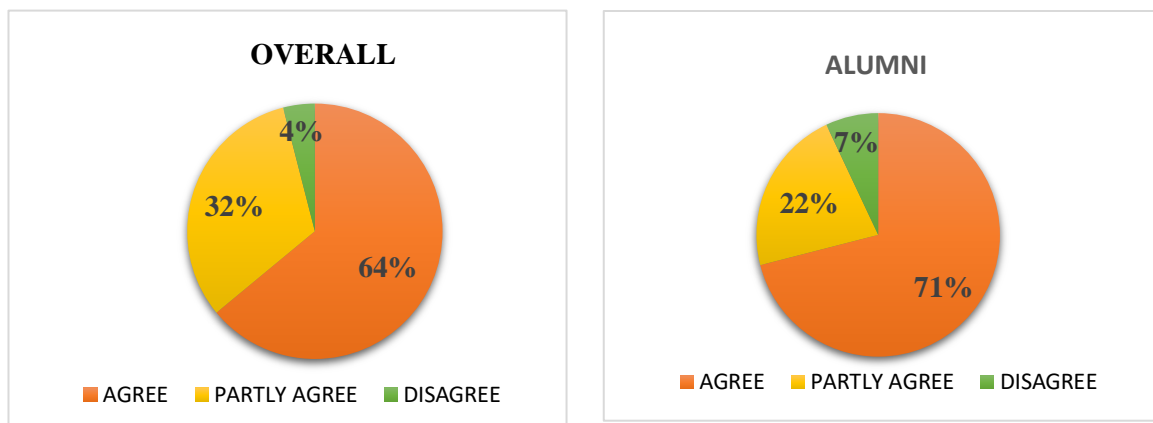

Fig 4: Response to relevance of recalling practice

3) Can this be considered as a better way, when compared to current existing, one sided teaching pattern?
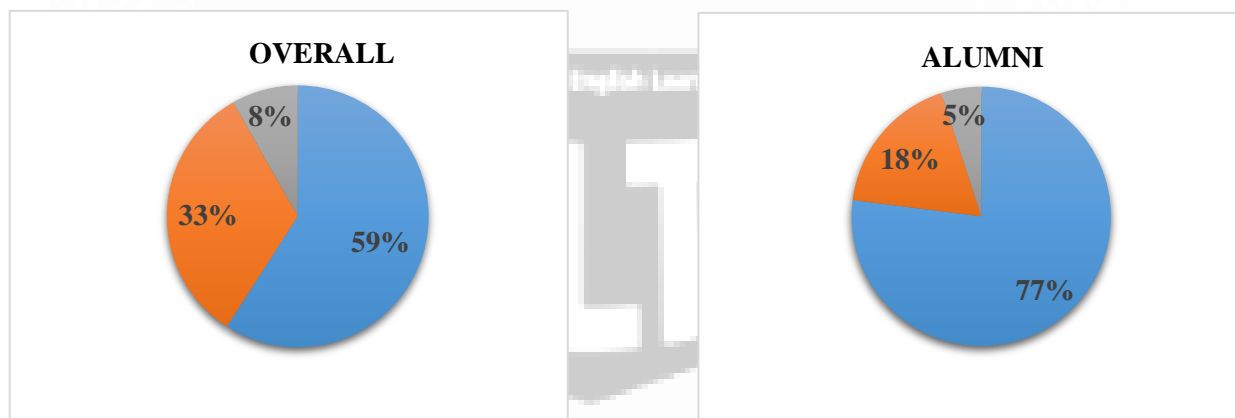

Fig 5: Comparison between current education system & proposed closed loop system

4) Does this method enable active participation in the classroom teaching learning process?
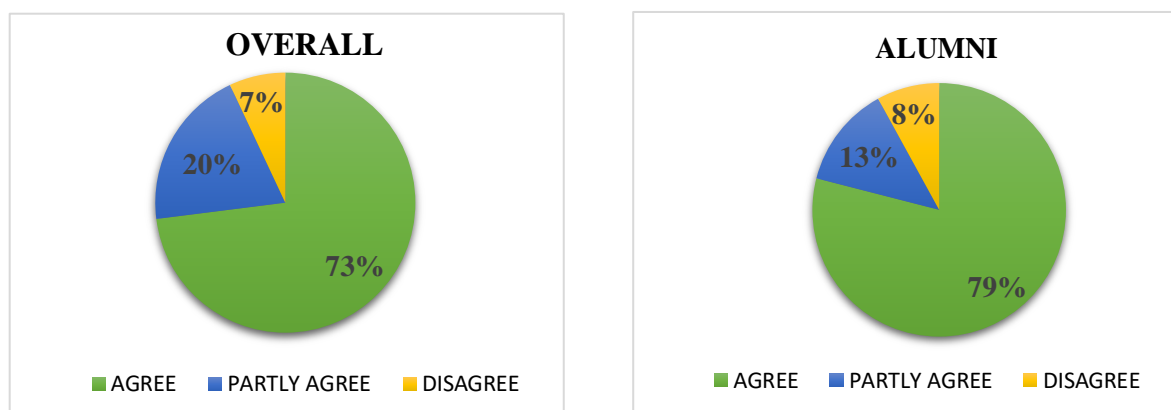
Fig 6: Participation in classroom teaching

5) Does this help you to improve technical communication through writing & speaking?

Fig 7: Improvement in Technical Communication

6) Does this help to improve your own performance and learning outcome?

Fig 8: Improvement in performance and learning outcome

7) Should this approach of closed loop teaching learning process be incorporated as a part of the current classroom teaching process?
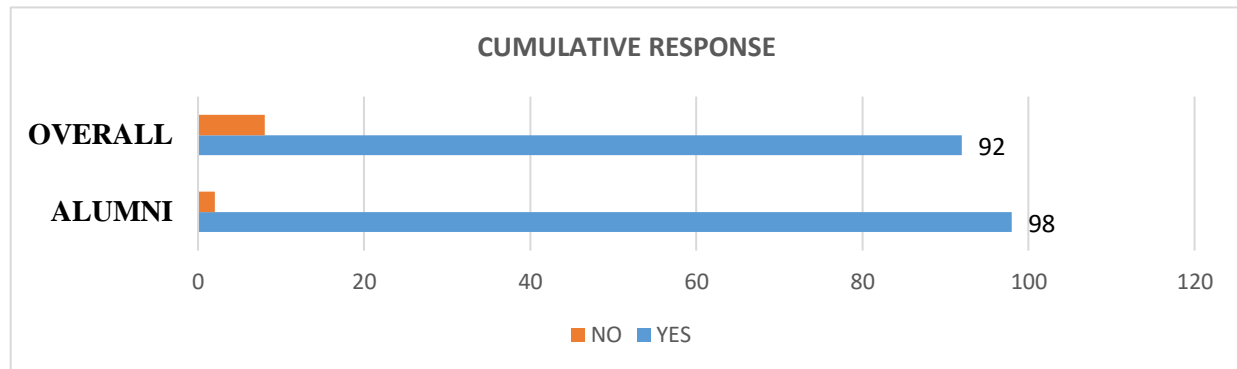
Fig 9: Universalization of closed loop teaching learning system

PARAMETER	AGREEMENT (%)		PARTIAL AGREEMENT (%)		CUMULATIVE AGREEMENT (%)		DISAGREEMENT (%)	
	A	O	A	O	A	O	A	O
UTILISATION OF ATTENDANCE TIME	83	74	14	23	**97**	**97**	3	3
RECALLING PRACTICE	78	60	18	32	**96**	**92**	4	8
INCREASED PRODUCTIVITY	79	73	13	20	**92**	**93**	8	7
ENHANCEMENT IN TECHNICAL COMMUNICATION	77	59	18	33	**95**	**92**	5	8
CLASSROOM PARTICIPATION	71	64	22	32	**93**	**96**	7	4
UNIVERSALIZATION	-		-		**98**	**92**	2	8

Table 1: Cumulative Response from the Alumni (A) & Overall (O)

5. FINDING OF THE STUDY

As per the inference from the survey conducted, the proposed system of outcome based closed loop teaching- learning process, actually proved to be beneficial and got universal acceptance by the student community with following value additions:

- **Recalling habit &Technical Communication:** The approach inculcates recalling habit with increased command over both verbal and non-verbal mode of communication, by virtue of the reading out and writing practice involved here.
- **Self- Assessment:** Scope for error correction from both, the learner as well as the teacher's perspective and for self- assessment by the learner himself, which enables one to understand the flaws one needs to work on.
- **Productivity:** The task is to be completed within stipulated time duration, thereby enhancing the productivity of an individual. Sometimes even after knowing the facts, it is at times difficult to put those down within the given time. So, this approach drives even the mediocre to give their best.
- **Class Participation &Team Learning:** This practice opens an opportunity to an individual to participate in class work and also learn from their peer group; thereby opening doors for group learning means all sailing in the same boat.
- **Individual empowerment:** Appreciation from the teacher and co-mates, thereby boosting up the morale of the individual and instilling confidence for future professional requirements.
- **Utilisation of attendance time:** As the complete exercise is to be executed during the attendance time, hence it adds value in the learning base and also promotes teaching learning environment, which is the essence of any classroom. It also helps in mind transition of the students and makes them ready to accept the learning, which is to be imparted to them, which was a drawback in the open loop system.

6.   CONCLUSION

The closed loop education system finds in itself a solution for the challenges faced in the existing open loop classroom learning process. The all in one approach giving its learners, the recalling practice with enhanced technical communication, learning in a team, increased productivity, and most importantly an opportunity for self- assessment and improvisations proposed by the teacher in the learning techniques, thereby transforming static teaching to dynamic teaching. The mind activating single practice, giving multiple benefits to the learners carries with itself, a great scope for improvement and enhancement of outcome of the learners if implemented all across the globe. Utilisation of attendance time for a value added learning; it transforms the classroom teaching and gives a greater mileage, compared to online education system.

ACKNOWLEDGEMENT

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