THE ESSENCE OF TRADITIONAL TEACHING METHODOLOGY OVER WEB BASED LEARNING -TRADITIONAL VS. FLIPPED CLASSROOM TEACHING METHOD

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ABSTRACT:

The traditional teaching method involves a teacher centric approach where a teacher explains the concepts and gives home work to revise. In today's web based world, the methodology is becoming clichéd against the flipped classroom approach based on video lectures, podcasts, and personalized home-based e-learning with discussion and practical applications in the classroom. Both methods need a teacher but there is a significant difference between the outcomes of learning for students. In India where there are many students in a classroom, an authoritative approach helps in reaching the mass. It supports the learning of the students where the learners are on same platform and taught from basics and all equally. One cannot ignore the benefits of flipped classroom which has an essence of covering more content and in more versatile way. However, in this exercise the few learners can be benefitted and few can lose on their learning due to no preparation of content at home. In India, the learner does not get a choice based grading education system always. Learner needs constant guidance, assistance and sometimes forceful dissemination of knowledge. According to Blooms Taxonomy first 2 levels of learning are remember and understand. Though they are being taken as the lowest levels of the triangle, they are the main base of learner's foundation system. Hence using application based learning from flip classroom and an authoritative approach for firming the fundamentals with mass would make learning extremely interesting and fruitful. For this paper the class sample size of 100 was divided equally among traditional and flipped classroom method. Both the learning's were compared and carefully studied. This paper tries to highlight on the traditional ways along with modern techniques which leads to progressive teaching learning process.

1. INTRODUCTION

The new millennium has been a witness to an exemplar shift in the field of education and knowledge dissemination. Today's education has a hands-on collaboration with up-swing technology advancement which synergizes with ever changing constant of time and knowledge applications. Adapting to the fiery competitiveness for survival and rapid technology advancements has affected almost all human endeavors; with education being among the core influenced in the whirlwind change of time. With the advent of World Wide Web made information literally in hands and extended human perception of knowledge acquisition beyond the horizon. However in spite of the information plethora; the gap between knowledge based learning and knowledge based practice is widened and skewed than anticipated.

1.1 Domain of learning:

As per Mahatma Gandhi, Education is the process which draws out best in oneself. United Nations human rights states that education aims to produce a well-balanced and integrated human resource which contributes in transforming the society towards knowledge acceptability, thus promoting Equality, Humanity and Peace for the mankind. UNESCO laid four pillars of learning that forms the basis to revisit education.

1. Learning to Know
2. Learning to Do
3. Learning to Be
4. Learning to Live together

To tap the right equilibrium of the learning it calls for a need to take a cognizance of the widely followed and practiced old methodology of traditional classroom learning and contemporary web based learning methodologies like flipped classroom over the timeline thus highlighting explicitly the relevance and irrelevance of both learning methods. It is left to the human rationale to choose the best. Learning domains are categorized as

cognitive domain (knowledge), psychomotor domain (skills) and affective domain (attitudes). Education system in India has evolved over a period of time, from the Gurukul system [Gurukul is an ancient residential education system where Guru (teacher) and Shishya (student) stayed together in a place away from the students house where Guru decided the career of student based on his vocation] it was transformed to the educational institutions confined to classrooms.

1.2. Traditional Classroom (TC) Teaching

Traditional teaching is confined to classroom with major focus on the teacher's skill, knowledge and understanding of the subject with age-old techniques of practicing and recommending recitation, memorization and culminating with oral and written exams. TC focusses on Remember and Understand which are the Low order thinking (LOT) level of Blooms' taxonomy.

1.3 Flipped Classroom (FC) Teaching

Flipped Classroom teaching utilizes the existing technology effectively in accordance to the student's convenience, to enable proactive preparation of the topic to be taught in the class by providing written study material, videos / podcast on the subject area in advance and following it with classroom based group discussions, presentations and questions facilitated by qualified teacher. The session culminates with fun oriented games or quiz based tests for validating the subject understanding. FC mainly addresses high order thinking (HOT) level of Blooms' taxonomy such as Apply, Analyze, Evaluate and Create.

The main objective of this paper is to compare both these methodologies in unbiased way. Today the role of teacher is to bring about the transformation in students by enabling them to be adept with the all emerging technologies. However in India students face problems like digital divide, coping up with continual change in revised methods and technology, to keep sustained interest in the non -optional course curriculum, rigid mindset, un-affordability for resource searching facilities etc. The students required to be motivated, mentored, coached and guided by the teacher for their overall development. If they are guided by the teacher in traditional classroom with activity based learning then both the aspects of lower and higher order thinking are satisfied.

Table 1: Actual Role and Goal of teacher in Traditional and Flipped classroom teaching

ROLE	**GOAL**
Memory builder	Effective use of all 5 senses to understand and learn
Critical Analyst	Evokes thinking with questioning techniques and discover answers
Coach	Post classroom one to one intervention on Self- confidence and belief
Mentor	Making learning interesting for students with heterogeneous learning styles
Didactic Teacher	Demonstrative methods evoke in-depth understanding
Facilitator	Facilitates knowledge enhancement with
	• Encouraging use of books • Self-Study by creating notes in your own language • Effective use of technology • Group/Activity/Project based learning • Inculcate leadership, cultural and moral values • Being friend, philosopher and guide

2. LITERATURE SURVEY

Blooms Taxonomy promotes higher forms of thinking in education, such as analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts i.e. rote learning (Ramya et. al (2017)). Traditionally teacher plays multi roles as a guide, coach who facilitates this higher learning in subtle interaction based on the relationship and rapport with the student. Magdalena et. al (2017) emphasize on active learning where teachers are not mere "deliverers of knowledge" but "facilitators to knowledge" that mainly focus on discussion, problem solving, cooperative learning, and writing exercises. Active learning engages the students in performing tasks and in applying the thought process while performing them and it relates to the three learning domains referred to as knowledge, skills and attitudes, which are goals of the learning process". Active learning is Just-in-Time Teaching, and develops thinking skills such as analysis, synthesis, and evaluation. According to Marika et.al (2017) teacher must be flexible in encouraging students in seeking information. While technology provides many opportunities, teachers have to allow their teaching to evolve as technology evolves. Promising are the innovations in technology

by enabling teachers to challenge this teacher-centered approach to education and put more of an emphasis on the students. As per Beatrice et.al (2017) from this second per peers learning experience, it appeared clearly that this innovative educational approach imposes to have a specific calendar with duplicated hours for lecture sessions with the teacher and only half of the students. Without this condition, may be a flipped classroom approach could be a good alternative. Though it was a very interesting way of learning complex course the effort taken by the teacher pre- and post-classroom were very time consuming and effort based.
These surveys throw light upon the modern practice of flipped classroom methodology which is student centric and changing roles but not importance of teacher with time.

3. METHODOLOGY

A small experiment was conducted to compare TC and FC from learners' perspective and teachers' observation.

Dataset used for study: The undergraduate students of First-Year Information Technology Engineering of Vidyalankar Institute of Technology (VIT), Wadala.

Table 2: Dataset

Total number of Students	100
Course	Applied Chemistry I, Mumbai University
Topic for Teaching	Estimation of hardness of water by Ethylene Diamine Tetra Acetic Acid (EDTA) method
Division A	50 students- Flipped classroom teaching methodology
Division B	50 students-Traditional classroom teaching methodology

3.1 Flipped Classroom methodology

The students of FE IT DIV A were given a brief outline about flipped classroom methodology and were asked to explore more on the method as deem fit. A weeks' time was given for preparation. The students were given guidelines of the topic and teacher was available online and offline for 1 hour each per day for doubt solving.
The students were handed over:

1. Teachers copy of notes on EDTA method in PDF format
2. Videos lectures on explanation of EDTA method in detail and how to solve numerical problems on EDTA and video on demonstrating experiment on EDTA method (source-YouTube)
3. List of reference books
4. Detailed and self-explanatory power point presentation prepared by teacher
5. Handouts of solved numerical problems

On the actual day of the delivery of the method,

1. Class was split in small groups of maximum 5 students
2. Teacher wrote subtopics on blackboard to be discussed
3. Instructions were stated by the teacher for the topic discussion
4. Group discussion initiated and commenced (max 30 minutes for each group)
5. Teacher observed and moderated the topic by visiting each group discussion and answered the doubts as and when raised
6. Each group was asked to present the summary of their discussion in front of class in 5 minutes using board, power point or verbally.
7. Broad questions raised by students were answered by peers and the teacher
8. Numerical problem on subject were solved by the group and presented on the board with teachers' facilitation
9. Rapid quiz was played to test the learning
10. Written Test was conducted to summarize the acquired knowledge
11. Teacher played the facilitator and catalytic role in the entire process

3.2 Traditional classroom Methodology

Students of FE IT DIV B were taught by this method.
The methodology highlights:

1. The teacher used a lecture method using chalk, blackboard and power point presentation.
2. The teacher opened the topic with basic questions on pre knowledge of the topic like concepts of hardness etc.
3. Teacher revised and revisited the concepts after short interval
4. Sample numerical problem were explained and solved by teacher
5. Practice problem were given by teacher and were solved by the students with teachers assistance
6. Summary of the session was conducted at the end of lecture
7. Rapid quiz was played to test the learning
8. Written Test was conducted to summarize the acquired knowledge

4. RESULT AND DISCUSSION:

4.1. Teachers observations

Teacher's observation of learners during the class was as follows

4.1.1. Flipped Classroom

(A) Pros:

1. Students appreciated the flipped classroom method
2. The students answered application of topic and discussed the commercial aspect of the topic
3. Many students were self-motivated to learn at their own pace in advance
4. They were content to be catered in small groups for their doubts
5. Their understanding was more effective with peer learning
6. While presenting to others, more innovative ways were showcased
7. The environment in the class was very friendly and informal
8. Teacher facilitated by directing, explaining, questioning, solving doubts
9. The overall class was an active learner

(B) Cons:

1. Some students displayed lack of motivation for pre-class preparation and learning as it was not a mandatory demand of course
2. Some students lacked time management for self-learning due to other course assignments
3. There was difficulty in solving numerical problems.

4.1.2. Traditional Classroom:

(A) Pros:

1. The coverage of topic was systematic in terms of prerequisites of topic, fundamental concepts, method, problems, summary etc.
2. Many students understood the concepts well and could reproduce easily
3. The concepts were revised and revisited on demand
4. The numerical problems were solved more efficiently and quickly by most of the students
5. Overall class had passive-active learners
6. The method was more examination oriented

(B) Cons:

1. The class was more teacher centric
2. The students had less physical movements in the class
3. Teacher had a task to match up with the pace of students
4. Students could not answer the question on other applications of EDTA method

4.2. Part B- Analysis of written test

4.2.1. Process:

The students were given an objective written test post both the TC and FC sessions to test different levels of Blooms taxonomy

1. Written test was comprised of 10 questions (Evaluate)
2. One question was based on numerical problem (Apply)
3. One question was on different application of the EDTA method (Apply)

4. Remaining 8 questions were based on the general understanding of topic (Remember and Understand)

4.2.2. Observations:

Table 3: Result analysis of the test conducted for FC and TC

Range	Traditional Class Score (%)	Flipped Class Score (%)
>90% (9-10 marks)	0	10
60-89% (6-8 marks)	40	30
40-59 % (4-6marks)	50	56
Below 40% (< 4 marks)	10	4

4.2.3. Highlights of the test

From Table 3 it was observed that,

1. 10% of FC scored above 90%
2. None of the TC could attempt application of EDTA method
3. Numerical problems posed some challenge for FC hence 10 % of TC scored more in 60-89%
4. Failures were less in FC

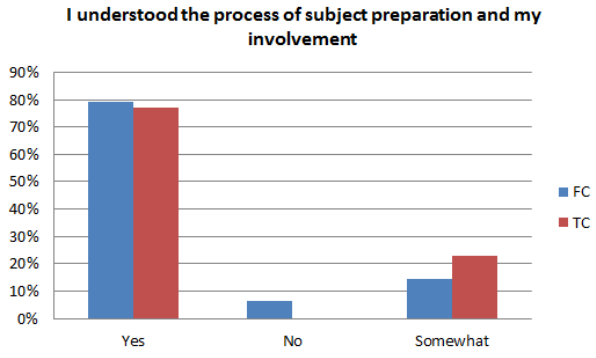
4.3. Result of teachers' observation and evaluation of written test

This exercise shows that students learn in a better manner by group discussion and through peer learning in FC. Some students of FC were unable to comprehend the concepts in the generalized learning which required the teachers' authoritative intervention thus ensuring proper understanding by each student. However with preparatory material given in advance understand the process (EDTA method) and answer the questions asked in a better manner. Some students were inspired to explore more information and applications of EDTA method, boosting their confidence and could score 9-10 marks. Understanding of concepts and numerical problem solving was somehow more effective in TC. Traditional teaching shows more suitability in exam oriented and time constrained semester pattern of Mumbai University. However implementation of high order thinking attributes are restricted to students' individual interest or the creative home assignment given by the teacher.

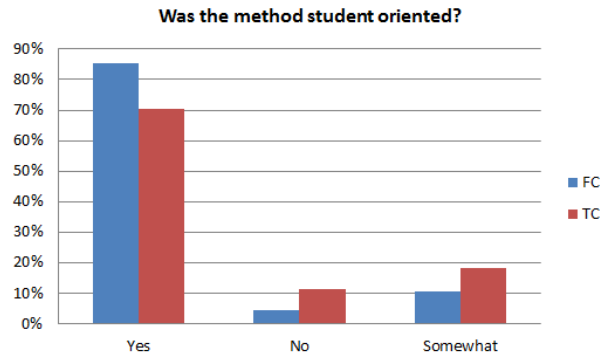
4.4. Students evaluation on both methodologies

Without learners feedback the results of the process cannot be inferred. A questionnaire was prepared to take the feedback of students post both the sessions of TC and FC. Questionnaire was shared with every student on Google form. The questionnaire included objective and subjective questions.
The selective response of students for the objective questions is shown in the following table

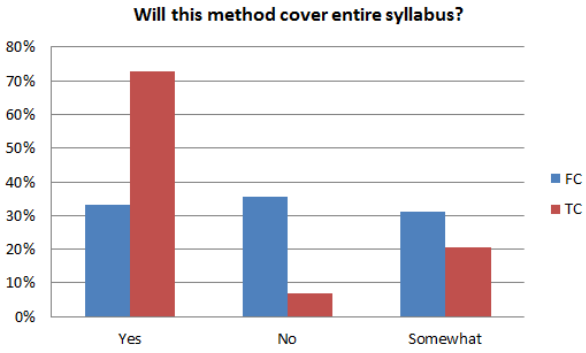
4.4.1. Objective response



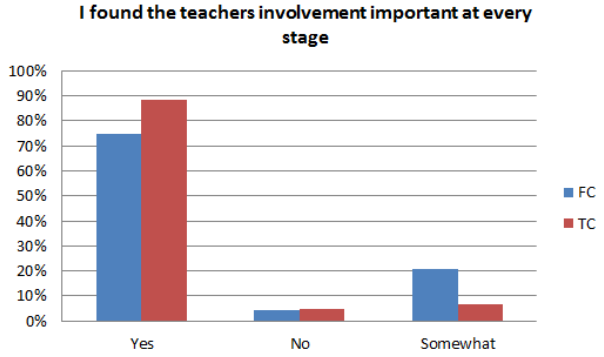
(a) 79% of FC & 77% of TC showed their active involvement in the entire process



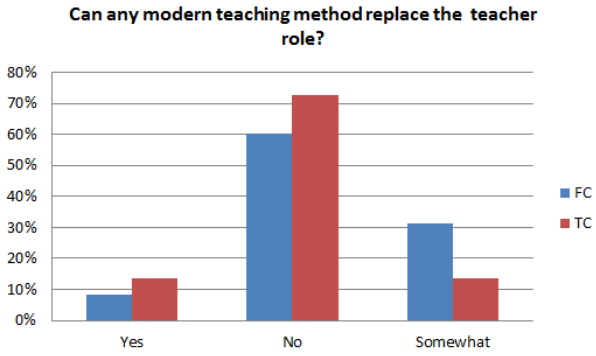
(b) 86 % of FC and & 71 % of TC found the method student oriented



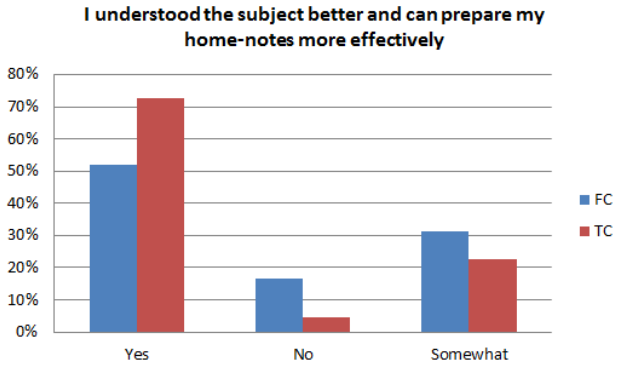
(c) 73 % of TC found the methodology suitable to cover the syllabus against 36% of FC



(d) 89 % of TC and 75% of FC found teachers involvement significant in learning



(e) 73 % of TC and 61% of FC students said that technology cannot replace teacher



(f) 73% OF TC and 52% of FC students feel that they can prepare home notes effectively

Figure 1 : Comparison of students responses of FC and TC (The graphs indicate percentage of students vs the response)

4.4.2. Subjective response from Students

Subjective feedbacks caters to unedited and natural responses of the students for fine tuning the resistance of student observed thus enhancing and improvising on the students expectations in progressive continuum . Some of the samples are listed below:

Feedback on FC methodology

"I found methodology to be somewhat ineffective. The length of the topic could have been in my opinion covered much faster in traditional method of teaching type class. Whereas, learning with classmates really felt like good learning experience. Concepts were better understood as there were many interpretations of the same content. The informality of this method made me quite comfortable. But time is a big issue here this methodology might work in a ""no time bound"" era of learning."

"As long as the course and teacher are interesting, the experience is fun. More emphasis could be given for students to explore current developments which maybe beyond syllabus or the curriculum could be revised more often since computers is an ever changing field"

"This method was good, as a student I read the matter, also by this method all of us in one group had the great conversation with each other, there was exchange of knowledge at the same time most of us were feeling problems in numerical, I think this method is useful but not all the time, this method is implemented once in a while"

"This teaching method is better for other semester but in crunched semester the traditional teaching is preferred as it speeds up the learning process and supports the preparations for exam""

Feedback on TC methodology:

"The traditional teaching method has one great advantage over other methods is that the teacher can clear any doubts, questions, queries of the students in a way the students can relate to. The exam point of view TC method sounds effective."

"I really love the lectures in which teachers ask the students questions and makes the class very interactive. I also like how teachers make us think and we already start to analyze what the syllabus holds for us. It also helps us clear our concepts as we think over the topic and answer our own doubts"

"It was good and at a pace which I can grasp the knowledge better. The methodology where teacher makes sure everybody understands is really helpful for the class"

"I found this method sometimes boring as we are confined to classroom"

4.5. Result

FC learners find knowledge, flexibility of learning at their own pace, informal classroom setup, open source learning, peer support and teachers' involvement significant. However they are worried about the time constraint in completing the syllabus and less exam oriented approach. TC learners are not provisioned for flexibility, freedom and pace of understanding. But their comfort level is high keeping time constraint and university pattern. However, in this method students-teacher rapport plays a major role in learning, understanding the concepts and problem solving. It also emphasizes on strong student teacher rapport which is highlighted in all teacher related question.

5. CONCLUSION

This paper attempts an unbiased and transparent analysis of traditional and flipped classroom methodologies. Both methodologies characterize their merits and demerits with factual evidence from the actual audience who patronize the entire learning process. For first year engineering graduates where they have time crunched semester, end semester exam pattern is most important and the students don't have choice to choose the course. However in both the methods the teacher emerges as the core and differentiating driver. The aforesaid web based method only adds technology dimension that makes learning handy and subtle. The rapid surge in competitiveness and information outburst has inadvertently scaled down the role of teacher in today's context. Though in wither of time the traditional teacher may appear malnourished and outdated but fundamentally it stands very strong and unmoved like a lighthouse.

The essence of traditional teaching methodology is a teacher student relationship. In the Indian context of populated class the students cannot be left in isolation and presumption that they can learn on their own. The authoritative approach of the teacher asserts the sense of guardianship thus enabling them to cope up their learning among large numbered class student. In a classroom the teacher can motivate students of heterogeneous learning styles such as visual, auditory and kinesthetic. Teacher plays different strokes for different folks. Teacher engages students with homework and varied assignment, projects, activities thus identifying their strengths and graduating them to HOT levels over a period of time. All the progressive technology interventions like flipped class, problem based learning, and case study learning are easily and willingly accepted as and when required with teachers' power of influence on students and not with influence of power.

There should be a perfect blend of the traditional and web based methodologies. The main emphasis of this paper is to rejuvenate the teacher who can influence the life of student beyond the syllabus and inculcate the qualities of honesty, trust, respect, punctuality, leadership, cultural and moral values by playing multi roles like friend, mentor, coach, counselor, and many more.

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