

CHAPTER: 17

ANALYSIS OF FUTURE TRENDS IN FLIPPED CLASSROOM AND MATHEMATICAL CORRELATION WITH TRADITIONAL CLASSROOM

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ABSTRACT

Flipped classrooms also redefine as inverted classroom. This kind of teaching comprehend in which task are given to the students to study at home from books and practice concepts through assignments. Through the Inverted classrooms teachers set target for their courses, learning for class in advance, choose high quality class, and helpful information collection upload on websites which also help in reducing paperwork which also helps in reducing the paperwork. The flipped classrooms are shifting from Passive learning to active learning state i.e., from traditional learning classroom teaching to flipped classrooms. In traditional classrooms students receives limited amount of time but on the other hand in flipped classrooms student get extra time and as they can learn through lecture videos also. It applies competency - based learning in which student becomes master of one topic before moving on to another topic. Flipped learning is a strategy in which teachers record their lectures and post those videos on online, which student can access. Students study at home by watching these videos and when they come to class, they let's get ready with that lecture. To improve the existing problems in the quality of teaching process this paper conducts descriptive research on Inverted classroom and to find out the problems faced in traditional classroom teaching method.

Key words: Face to face teaching; Higher education; Flipped classroom; scoping review.

I. INTRODUCTION

Flipped classroom is termed as inverted classroom because in the flipped classroom the classes are shifted from traditional to modern learning. The study of flipped classroom is literally a convenient learning option in which student can recall the

information easily whenever they want, as all the information is available in the form of video, assignment, and practical and other material on the internet.

Under this, teacher recorded their lectures and post those videos, which students can access. Students study at home by watching these videos and when they come to the class, they let's get ready with the lecture. Flipped classroom is a type of instructional strategy and blended learning. It replaces the traditional educational system by providing instructional material outside the classrooms. In which students watch online lectures, conduct online discussion and conduct research under the guidance of an instructor.

Conversion of teaching method from passive learning to active learning is possible when you know about the concept of Inverted classroom needs and importance of Inverted classroom, strengths and weakness of Inverted classroom, future of scope of Inverted classroom.

Some researcher have work on the effect of the flipped classroom strategy on the academic achievement and instructional strategy on students. Chen, L., Ritzhaupt, A. D., & Antonenko, P. (2019). Effects of the flipped classroom instructional strategy on students' J daitawi, M. (2019). The Effect of flipped classroom strategy on students learning outcomes.

II. REVIEW OF LITERATURE

Literature review by various authors gives enough information about flipped classroom, how to make education sector more effective & also improve the quality of teaching in education sector. Some studies suggest that flipped classroom recommended too many better academic performance, other studies emphasize weakness associated with flipped classroom. For example, in the flipped model student learning achievement and contentment may be enrichment (Missildine, Fountain, Summers, & Gosselin, 2013);

The conclusion was that contentment of so, many students was substantially enhanced through flipped classroom collate to the traditional classroom (Davies et al., 2013) However, challenges can include more required time to redesign the course as a flipped classroom (Schlairet, Green, & Benton, 2014), students can be more satisfied with the flipped method; and it can be more effective and efficient than traditional instruction (O'Flaherty & Phillips, 2015) According to their findings the flipped classroom uses various method of teaching which caused changing the classroom concept to flipped classroom Ozdamil, G Asikoy (2016), Implementing flipped classroom using social media. A differentiate of two demographically different groups perceptions.

Sohrabi et al. (2016), inconsistent behaviors by some students (Sun, Wu, & Lee, 2017), the literature suggest that the inverted model of instruction entails both strengths and weaknesses. However, up to now only some studies have inspected the educational strength and weakness of flipped classrooms. This new discover of the strength and weakness broadcasted in research studies identify on this approach can more comprehensively suggest quickest practices, and areas for future research and development. In the present study, 71 research studies examining flipped classroom, published to the end of 2016, were classified and standardize analyzed.

Chen, L., Ritzhaupt, A. D., & Antonenko, P. (2019). Effects of the flipped classroom instructional strategy on students' learning outcomes: A Meta-analysis. *Educational Technology Research and Development*, 67, 793-824.

Jdaitawi, M. (2019). The Effect of flipped classroom strategy on students learning outcomes. *International Journal of Instruction*, 12(3), 665-680.

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Chang, C., Kao, C., & Hwang, G. (2020). Facilitating students' critical thinking and decision making performances: A Flipped classroom for neonatal health care training. *Educational Technology & Society*, 23(2), 32–46.

Cheng, S., Hwang, G., & Lai, C. (2020). Critical research advancements of flipped learning: A Review of the top 100 highly

III. OBJECTS OF THE STUDY

- To study about the concept of Inverted classroom.
- To understand the needs and importance of Inverted classroom.
- To know about the strengths and weakness of Inverted classroom.
- To understand the future of scope of Inverted classroom.
- To study about how flipped classroom work.
- To understand the difference between flipped classroom and traditional classroom.

IV. RESEARCH METHODOLOGY

This is an expressive study. The research has been collected from secondary as well as primary data such as questionnaire books, journals, magazines and internet.

About Flipped Classrooms

Flipped classroom is a type of instructional strategy and blended learning. It replaces the traditional educational system by providing instructional material outside the classroom.

This is reverse of the more common practice of introducing new content at school then assigning homework and projects to complete by the students independently at home.

We conclude the seven stanchion of flipped classroom

F- Futuristic approach

L-Learning content

I-Interesting

P-Professor's Assistance

P- Perfect classroom

E- Effective understanding,

D- Design creativity

Features of Flipped Classrooms

- It is a futuristic approach, strategy and programs to complete through the students.
- Inverted classroom is used for active learning. Provide a chance for students to gain antecedent to class.
- It is an interesting classroom in which students focus on their assignment, practical and homework in advanced.

- In flipped classrooms professor's assistance to the student. Clear rules and expectations.
- It is a perfect classroom in which professors uploaded assignment & notes on web so the student can prepare themselves in advanced.
- Students get higher grades in flipped classrooms in comparison to traditional classrooms and council them to change into flipped classroom from traditional classrooms those who are struggling in classes so that they can boost their performances.
- Flipped classroom activities allow students to show their talent or make innovation that add value to their work or add some modernity to their work.

Difference between traditional classroom and flipped classroom

Traditional classroom	Flipped classroom
Teacher teach to the students only and only by the way of face to face method.	Teacher record their lecture & post those videos, which students can access.
Student receive limited amount of time they can't learn through lecture videos	Student get extra time & as they can learn through lecture videos also.
Include offline lectures, conduct offline discussion.	Include online lectures, conduct online discussion.
Students can't save their lecturer they can only write it.	Students can save their lectures for future.
Only paper work is given by the professors to the student.	Assignments & worksheets are uploaded by the professors on web.

How flipped classrooms work

- Assignment & worksheet are uploaded by the professor on the web.
- Information given by the professor to the students regarding the assignment & worksheet.
- Students watch an online lecture, conduct online discussion and research under the guidance of an instructor.
- Student study at home by watching web material and when they come to the class, they let's get ready with that lecture.

Needs of Flipped Classroom

- To make the classroom design creative learning environment.
- To enable students to learn through effective understanding.
- To make the learning concept more interesting via online lectures for the instructor reaching to each student individually, rather than the class as whole.
- To share lectures outside of class time.

Pros and cons

Pros

- There is no wastage of time in flipped classroom because students are already ready in classroom after reading that topic.
- It promotes student- centered learning and collaboration.
- Text and content are more accessible (provide technical access).
- Students have more control to recall the information for post examination.
- It is an efficient and effective concept.

Cons

- Complicated for those students who are incapable to purchase computers, laptops or smart mobiles.
- Health issue may pose a problem because of excess exposure to these devices.
- Necessary to have computer literacy.
- Sometimes there is no direct interaction between professors & students which may create communication gap.
- Sometimes students are misusing of technology and spend excess time on these devices.

V. FUTURE OF FLIPPED CLASSROOM IN EDUCATION SECTOR IN INDIA

Flipped classroom is a new teaching learning method which enables the India is moving from traditional to modern. Especially when COVID-19 came entire education system shifting from offline to online and only due to e-teaching the studies could continue so, the importance of flipped classroom increased. The use of flipped classroom deluge due to pandemic situation. Students and educators did not meet alone like they used to do in offline classes the trend of flipped classroom increased. This shift publicized the ability of comprehensible, bendable and engaged in virtual learning method. Flipped classroom is a learning method which is popular all over the world as well in India. Indian school of business is first institute in India who expose this learning system in country to teach the management course students. A further learning instrument i.e., creates technology has also been developed which provide the content and tells how much the learner have learned. It has been already acquainted in Assam University in ISB and in National Police Academy. In the future of India flipped classroom may become more common in business school.

VI. FINDINGS AND DISCUSSION

Table1. Responses to Would you recommended the flipped classroom to your friends?

Statement	SA	A	UN	D	SD	Total
Would you recommended about flipped classroom						
Total	20	5	1	3	1	30
Percentage	66.6	16.6	3.4	10	3.4	100

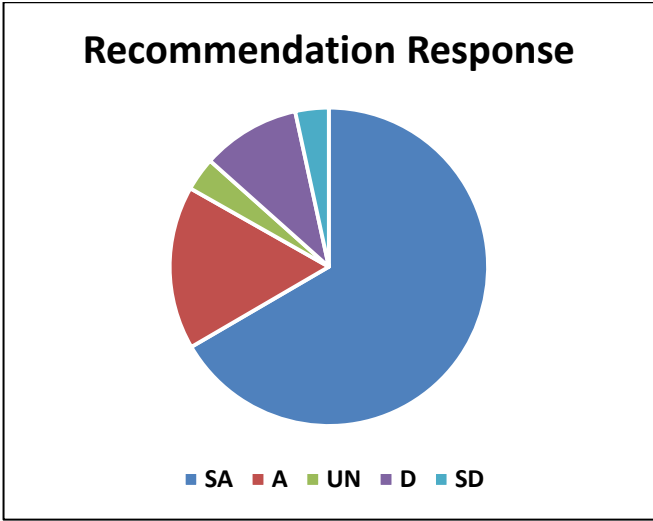


Table 1. Shows that in the response to recommendation of flipped classroom learning method of teaching 66.6% students are strongly agreed,16.6% students are agreed ,3.4% students had not decided ,10% students are disagree and 3.4% students are strongly disagree. So, the conclusion of this data is that maximum percentage of students are ready to recommend the flipped classroom learning method to their friends.

Table2. Response to the flipped classroom is more effective than traditional classroom learning method?

Statement	SA	A	UN	D	SD	Total
Flipped classroom is more effective than traditional classroom's						
Total	25	2	1	1	1	30
Percentage	83.3	6.8	3.3	3.3	3.3	100

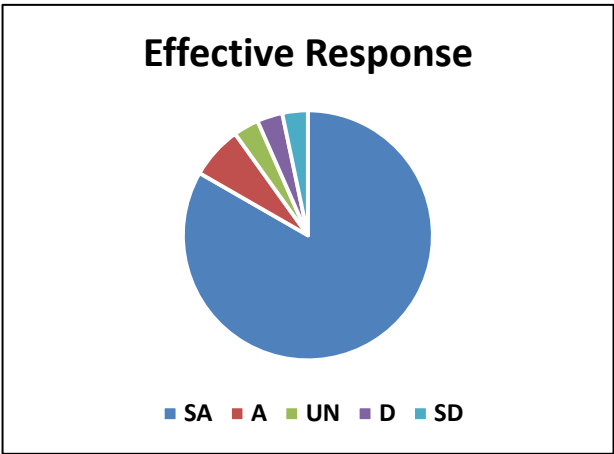


Table 2. Shows that in the response to flipped classroom learning method is more effective than the traditional classroom learning method 83.3% students are strongly agreed,6.8% students are agreed ,3.3% students had not decided ,3.3% students are disagree and 3.3% students are strongly disagree. So, the conclusion of this data is that maximum percentage of students are concur that the flipped classroom learning method is more effective than the traditional classroom learning method.

Table3. Response to will flipped classroom learning method improves student's performance?

Statement	SA	A	UN	D	SD	Total
Response to would you recommended the flipped classroom to your friends	20	5	1	3	1	30
Response to would the flipped classroom is more effective than the traditional classroom	25	2	1	1	1	30
Total	45	7	2	4	2	60
Average	22.5	3.5	1	2	1	30
Percentage	75	12	3	7	3	100

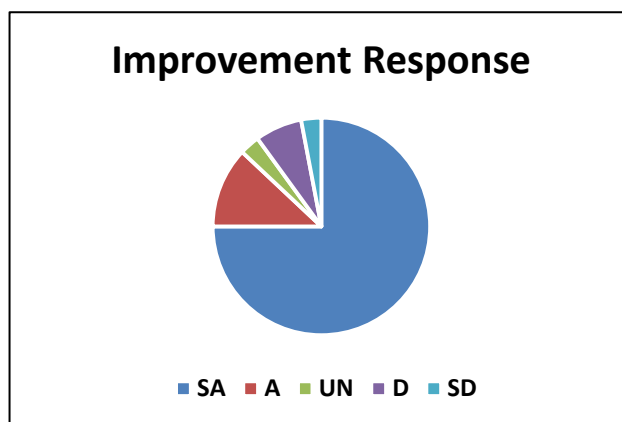


Table 3. Shows that in the response to will the flipped classroom learning method improves the student's performance so, we have analyzed on the basis of table1. & table2. That is on the average of a total of 22.5(75%) ,3.5(12%) , 1(3%), 2(7%), 1(3%) respondents strongly agreed, agreed, had not decided, disagreed ,and strongly disagreed so, hence proved that flipped classroom teaching is the best style of teaching which improve the performance of students.

VII. MATHEMATICAL CORRELATION BETWEEN FLIPPED CLASSROOM AND TRADITIONAL CLASSROOM.

Years with months	Flipped classroom (x)	Traditional classroom (y)	X ²	Y ²	XY
2021(July)	5	4	25	16	20
2021(Aug.)	10	8	100	64	80

2021(Sept.)	15	12	225	144	180
2021(Oct.)	20	16	400	256	320
2021(Nov.)	25	20	625	400	500
2021(Dec.)	30	24	900	576	720
2021(Jan.)	35	28	1225	784	980
2021(Feb.)	40	32	1600	1024	1280
2021(mar.)	45	36	2025	1296	1620
2021(Apr.)	50	40	2500	1600	2000
2021(may)	55	44	3025	1936	2420
2021(June)	60	48	3600	2304	2880
2022(July)	65	52	4225	2704	3380
2022(Aug.)	70	56	4900	3136	3920
2022(Sept.)	75	60	5625	3600	4500
2022(Oct.)	80	64	6400	4096	5120
2022(Nov.)	85	68	7225	4624	5780
2022(Dec.)	90	72	8100	5184	6480
2022(Jan.)	95	76	9025	5776	7220
2022(Feb.)	100	80	10000	6400	8000
2022(mar.)	105	84	11025	7056	8820
2022(April)	110	88	12100	7744	9680
2022(may)	115	92	13225	8464	10580
2022(June)	120	96	14400	9216	11520
2023(July)	125	100	15625	10000	12500
2023(Aug.)	130	104	16900	10816	13520
2023(Sept.)	135	108	18225	11664	14580
2023(Oct.)	140	112	19600	12544	15680
2023(Nov.)	145	116	21025	13456	16820
2023(Dec.)	150	120	22500	14400	18000
Total	$\Sigma X=2325$	$\Sigma Y=1860$	$\Sigma X^2=5405625$	$\Sigma Y^2=3459600$	$\Sigma XY=4324500$

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

According to the formula of linear correlation We have,

$$r(xy) = \frac{30(4324500) - (2325)(1860)}{\sqrt{[30(5405625) - (2325)^2][30(3459600) - (1860)^2]}}$$

$$r(xy) = \frac{129735000 - 4324500}{\sqrt{162168750 - 5405625 * 103788000 - 3459600}}$$

$$r(xy) = \frac{125410500}{\sqrt{156763125 * 100328400}}$$

$$r(xy) = \frac{125410500}{12520.5 * 10016.4}$$

$$r(xy) = \frac{125410500}{125410336.2}$$

$$r(xy) = \frac{125410500}{125410336.2} \cong 1$$

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$$r(xy) \cong 1$$

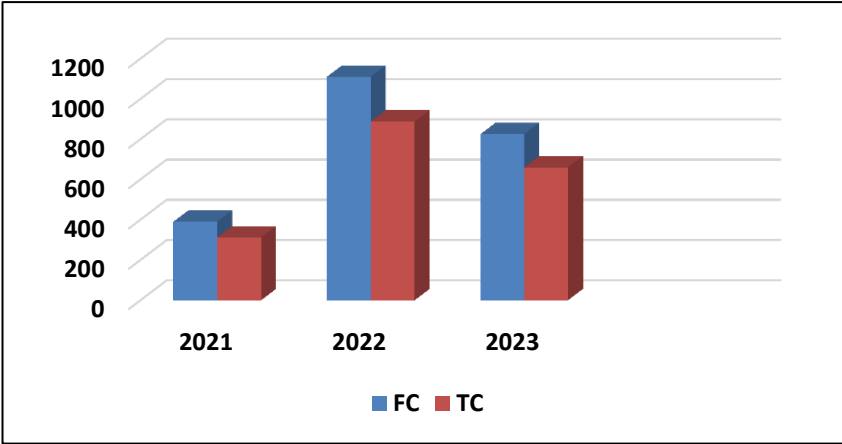


Table 4. Shows the graphical representation of correlation between flipped classroom and traditional classroom.

Blue color represent Flipped classroom.

Red color represent Traditional classroom.

This study inspect the personal opinions and the experience of the students year wise with months from 2021 July to 2023 December.

This bar chart illustrate the correlation difference between flipped classroom and traditional classroom.

We conducted a survey on the students of Anand Engineering College. The students gave rating to the flipped classroom and the traditional classroom according to month wise so, the result of flipped classroom increased month by month and the result of traditional classroom decreased month by month.

Because of the scarcity of place in the graph so, we conclude the result on the basis of sum of year wise.

Year	Flipped classroom	Traditional classroom
2021	390	312
2022	1110	888
2023	825	660

In the year 2021 student gave the ratings 390 to flipped classroom and 312 to traditional classroom.

In the year 2022 student gave the ratings 1110 to flipped classroom and 888 to traditional classroom.

In the year 2023 student gave the ratings 825 to flipped classroom and 660 to traditional classroom.

This graph represent the higher difference between the flipped classroom and the traditional classroom at the time of survey we conducted flipped classroom and traditional classroom in the college campus for the survey result in which students gave the high preference to the flipped classroom as compare to the traditional because flipped classroom is an efficient& effective approach.

In the survey of the year 2021 students moving from traditional to modern. Especially when COVID-19 came entire education system shifting from offline to online and only due to e-teaching the studies could continue so, the importance of flipped classroom increased. The use of flipped classroom deluge due to pandemic situation. Students and educators did not meet alone like they used to do in offline classes the trend of flipped classroom increased. This shift publicized the ability of comprehensible, bendable and engaged in virtual learning method.

So, this analysis was very helpful for us and we found out that flipped classroom is best classroom which will increase the students' performance.

CONCLUSION

According to the findings of this research paper the flipped classrooms are redefined class activities. The flipped classrooms are shifting from passive learning to active learning state i.e., from traditional learning classroom teaching to flipped classrooms.

Flipped classroom gives the instructor more time to teach each student individually, rather than a class as whole. It encourages students to understand the underlying rationale behind the information provided being to them. Flipped classroom termed as an inverted classroom, is anew and popular instructional model, in which activities traditionally conducted in the classroom.

To improve the existing problems in the quality of teaching process this paper conducts descriptive research on flipped classrooms and future of flipped classrooms to find out the problems faced in traditional classroom teaching method.

The effort put in is worth the while because the flipped classroom model has been proven to increase the retention of knowledge learned and make valuable class time more worthwhile for learners.

The findings revealed that the flipped classroom learning method will improve the student's performance so, on the basis of table 1. & table 2. That is on the average of a total of 22.5 (75%), 3.5 (12%), 1 (3%), 2 (7%), 1 (3%) respondents strongly agreed, agreed, had not decided, disagreed, and strongly disagreed so, hence proved that flipped classroom teaching is the best style of teaching which improves the performance of students.

In table 4. We analyzed the best result year wise in which we found that flipped classrooms are far better than traditional classroom

The compendious fact about this study is to renovate the learning method from the lecturer-centered to student-centered with extracurricular activities be owned by the students.

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