

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY: APPLIED BUSINESS AND EDUCATION RESEARCH

2023, Vol. 4, No. 2, 624 – 635

<http://dx.doi.org/10.11594/ijmaber.04.02.29>

Research Article

Comparison between Traditional Classroom and Flipped Classroom on Student's Engagement and Satisfaction

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Article history:

Submission February 2023

Revised February 2023

Accepted February 2023

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ABSTRACT

Background: The implications of flipped classrooms are increasing day by day around the world for better benefits compared to traditional classrooms. But the application and research about this field are insufficient in Bangladesh. **Objective:** The present study was conducted to investigate the effectiveness of the flipped classroom learning environment on students' engagement and satisfaction compared to a traditional classroom. **Methods:** Result showed a significant difference in student engagement and satisfaction with flipped classroom being favored over traditional classroom. A cross-sectional survey research was conducted using a 5-point Likert-type questionnaire to measure student engagement and satisfaction, respectively, on both the traditional classroom and the flipped classroom. Data were collected from 79 participants from the traditional classroom and 61 participants from the flipped classroom. After six weeks of intervention on flipped classroom method, again a survey was carried out to discover student engagement and satisfaction. The obtained data were analyzed by employing descriptive statistics, t-test, and correlation by SPSS version 26, Microsoft Excel version 19, and an online t-test calculator. **Results:** The study's findings revealed a significant mean difference in student engagement and satisfaction between the traditional and flipped classrooms. The outcomes also showed that students were more engaged and satisfied with flipped classrooms than with traditional classrooms. Another outcome to note is that the flipped classroom was also able to differentiate students based on class activity and regularity, while the traditional classroom could not. **Conclusion:** The findings suggest that the flipped classroom model has the potential to be the ideal education system in

How to cite:

Sarker, P. C., Siddique, Md. N. E. A., Sultana, S., & Pal, S. K. (2023). Comparison between Traditional Classroom and Flipped Classroom on Student's Engagement and Satisfaction. *International Journal of Multidisciplinary: Applied Business and Education Research*. 4(2), 624 – 635. doi: 10.11594/ijmaber.04.02.29

the 21st century and to address the 4th Industrial Revolution. Further investigation, assessment, and modification are necessary for widespread implementation.

Keywords: *Flipped Classroom, Flipped Learning Approach, Flipped Learning Instruction, Student Engagement, Student Satisfaction, Traditional Classroom*

Introduction

Students of the 21st century are facing various challenges in the traditional classroom. Before implementing the flipped classroom intervention, feedback about the traditional classroom was sought from students and colleagues. According to their opinion, "only some students were fully engaged in the classroom, some were using social media during class time, like Facebook; some were not interested; some were absent in class without any reason and unwilling to sit on the first bench." Most of the time, teachers spent delivering lectures to the class, and students were only listeners. They had a few activities to do in the classroom, and there was less interaction between both teachers-students and students-students". In this context, they further allege that students also spent five academic years in their institutions, but they were not so skilled as to talk or present something in front of an audience. Overall, most of them were dissatisfied and disengaged (Model Teaching, 2020).

In order to address and resolve our instructional issue of low student engagement and satisfaction in the classroom, we preferred a flipped classroom as our intervention. "The flipped classroom is a pedagogical model where traditional lecture and homework elements of a course are reversed. It inverts traditional teaching methods, delivers instruction outside of class, and moves homework into the classroom." (Du, Fu & Wang, 2014, Cheng et al., 2020). Besides, a clear definition is given by the Europass Teacher Academy (2020). According to them, "A flipped classroom is an instructional strategy and a type of blended learning, that aims to increase student engagement and learning by having pupils' complete readings at home and work on live problem-solving during class time." It also offers a more flexible and interactive classroom atmosphere (Wang & Jou,

2020, Ustun & Tracey, 2021). On the other hand, blended learning consists of offline and online educational methods. The flipped classroom is a technology-based learning process. It is related to blended learning (Westermann, 2014). As blended learning is contributing directly to SDG4 by ensuring education opportunities in remote areas and in unfavorable situations like COVID19 (Ramalingam et al., 2022; Wang & Teter, 2018).

The results of various studies show that flipped classroom interventions are effective for various disciplines (Davies et al., 2013; Fautch, 2015; Hung, 2015; Mason, Shuman, & Cook, 2013; Missildine, Fountain, Summers, & Gosselin, 2013; Schultz, Duffield, Rasmussen, & Wageman, 2014; Strayer, 2012; Wilson, 2013). Flipped classrooms have become quite popular at the present time (Tang et al., 2017). Many studies have shown positive results. Flipped classrooms are more efficient than traditional classrooms (Davies, 2013). Flipped classrooms: a transformation from teacher-centered learning to student-centered learning (Kong, 2014). The flipped classroom is the most effective way to increase student academic performance (Bernard & Ghaffari, 2019; Castedo et al., 2019; Chen & Law, 2016; Sung et al., 2017) than the traditional classroom, for both active and inactive learners (Wang et al., 2022). Missildine et al. (2013) conducted a quasi-experimental study and compared three approaches: traditional lecture only, lecture and lecture capture back-up, and the flipped classroom approach of lecture capture with innovative classroom activities. They concluded that students learn more in a flipped classroom than through other learning methods. Students achieve 10% more in flipped classrooms than in traditional classrooms (Bidwell, 2014; Yilmaz & Keser, 2017). Moreover, many studies have shown that students in flipped classrooms tend to be

more satisfied and have a positive attitude (Davies et al., 2013; Hung, 2015; Kong, 2014; Mason et al., 2013). Flipped classrooms have more learning achievement, accelerated learning experience, and motivation (Bhagat et al., 2016; Cheng et al., 2020; Bernard & Ghaffari, 2019; Castedo et al., 2019; Chen & Law, 2016; Sung et al., 2017). Wang et al. (2022) revealed that the flipped classroom was more effective than the traditional classroom for both active and passive students. Recently, the flipped classroom method has received much attention in the field of education all over the world (Al Mamun et al., 2022; Korkmaz & Mirici, 2021; Latorre-Coscolluela et al., 2021; Nerantzi, 2020; Tang et al., 2020; 2017), but it has not been investigated and implemented vastly in Bangladesh. Even, there are a few studies on flipped classrooms regarding student engagement (Bernard & Ghaffari, 2019; Castedo et al., 2019; Chen & Law, 2016; Sung et al., 2017), satisfaction, and comparison between flipped classrooms and traditional classrooms. As a result, the study is a new in these aspects.

Rational of the study

In the modern era, everything is changing very fast, including education. So, we need 21st century classrooms, teachers, and learners to meet the present and future needs of our country for sustainable development (Scott, 2015; Voogt, 2013). For this purpose, we implemented flipped classrooms in our institutions. We expected to make our students more attentive, more engaged, and more involved in the classroom using the flipped system (Ustun, Karaoglan-Yilmaz, & Yilmaz, 2021). This project was designed to apply flipped classroom teaching to 1st year honors students of the department of psychology at Rajshahi College in Bangladesh. The intervention was carried out for six weeks. At the beginning of the intervention, we conducted a survey about the traditional classroom to explore and support the instructional issue of our concern. This intervention was conducted at Rajshahi College, which is one of the oldest and most renowned institutions of higher education in Bangladesh. It was established in 1873 in Rajshahi, a divisional city. It was the first institution in the territories to offer undergraduate degrees in various

disciplines since 1878. Now, this college is affiliated with the National University and follows the guidelines set by the Ministry of Education. Since 2018, Rajshahi College has tried to apply the student-centered learning (SCL) method. Its infrastructure is well decorated, and other facilities are available, such as a sound system, a multimedia projector, and so on.

In the context of Bangladesh, the flipped classroom is a new teaching method. Some educational institutions are experimenting with flipped classrooms. The effectiveness of the flipped classroom, especially in psychology, has not yet been tested. Moreover, a limited number of studies have been conducted about students' engagement and satisfaction as well as comparisons between flipped classrooms and traditional classrooms in the world but not in Bangladesh.

The study intends to examine the effectiveness of the traditional and flipped classroom learning environments on students' engagement and satisfaction. The following were some of the study's specific questions:

1. Is there any relation between student' engagement and satisfaction?
2. Is there any mean difference between male and female participants?
3. Is there any mean difference between regular and irregular students?
4. Is there any mean difference between active and inactive students?
5. Is there any significant difference in the student' engagement between the traditional and flipped classroom scores?
6. Is there any significant difference in the student' satisfaction between the traditional and flipped classroom scores?

Methods

Participants

A single group repeated measurement group design was followed to conduct the research. A total of 79 students (Male = 31 and Female = 48) was selected conveniently as a sample of this study. Among them 79 respondents were participated in traditional classroom and 61 respondents were participated in flipped classroom. Rest of the 18 participants did not take part in flipped classroom session

due to lack of device and/or internet connection.

Study location: The study was conducted in the department of Psychology at Rajshahi college, Rajshahi, Bangladesh.

Study duration: 6 weeks study duration from February to March in 2022.

Instruments

Student satisfaction and engagement questionnaire/items: See the **appendix A & B**.

Hung (2015), Johnson (2013), and Yordchim and Gibbs (2014) were used to create these two questionnaires. In the original scale, there were 16 items on the satisfaction scale and 19 items on the engagement scale (Alsowat, 2016), but from both questionnaires, we separately adopted and used 10 items of according to cultural context. The Cronbach Alpha (α) (internal consistency) of the student satisfaction questionnaire in this study was 0.827, and the student engagement questionnaire was 0.831. We used a 5-point Likert-type scale ranging from strongly disagreeing (1 point) to strongly agreeing (5 points). The summative score range of the two questionnaires was 10 to 50, with higher scores indicating higher levels of satisfaction and engagement. The data has been collected through Google Forms and analysed through IBM SPSS 26 and Microsoft Office (Excel) 2019.

Procedure

This study was conducted as part of a training program. For this purpose, we applied the "flipped classroom" method in our class. Before the intervention, we made a plan of what we would do in the intervention. We made six lesson plans for each intervention. For this purpose, we arranged classrooms, created PowerPoint classes, made class videos, created messenger groups for communication, and collected other materials. All students were asked to complete the first questionnaire about traditional classrooms prior to the flipped classroom intervention. After completing the 6-week intervention on flipped classroom, they were asked to complete the second questionnaire about it. The traditional and flipped classroom scores were compared for each item and group by t-test.

Intervention

These are three stages of instruction for flipped classrooms. These are before class, in class, and after class. Firstly, students got a learning resource package before beginning the class for each topic (chapter) in Google Classroom, a WhatsApp group, a Facebook page, and/or a Facebook Messenger group. The materials included PowerPoint slides, PDFs, and YouTube video links. The main activities of the students are to learn the supplied material at home before attending the next class. They had to read this material deeply and find out about related problems to understand the topic. If they were unable to understand anything about the topics, they could ask the instructor in the next class. Based on these materials, they all prepared their assigned task for a class test using Kahoot (a Web 2.0 tool). After brainstorming, they would ask some questions if they had any and engage themselves in discussion. They then completed group projects and a Google Form quiz. In the last class, the teacher previewed the next class and gave homework.

Resources and Materials

Researchers required many resources and materials, such as Google Classroom, an email ID, PowerPoint slides, a PDF file, YouTube video links, Kahoot apps, a Google Form, a Facebook Page, a Messenger Group, a multimedia projector, an internet connection, a computer, a mobile phone, etc. In our project, a feedback form, a survey, and observation showed whether the intervention was effective or not.

Challenges

We faced some problems during the flipped classroom intervention. These were weak Internet connections, lack of knowledge about smart technologies, insufficient devices among students, an electricity problem, poor infrastructure, and an acceptance of the new idea. Besides, students had difficulty adapting to new teaching methods. We trained them up. We were unable to carry out the planned intervention due to COVID-19 lockdown and restrictions.

Result and discussion

We collected performance data before and after the intervention through a survey questionnaire. The results of the study were

tabulated and interpreted by descriptive statistics, Pearson’s product moment correlation, and a *t*-test through IBM SPSS version 26 and online software.

Table 1. Demographic information of the participants

Variables	Level	Traditional classroom		Flipped classroom	
		Frequency	Percentage (%)	Frequency	Percentage (%)
Number of participants		79	100	61	100
Age (Mean (SD))		19.85 (.87)		19.79 (.66)	
Gender	Male	31	39.24	21	34.42
	Female	48	60.75	40	65.57
Regularity	Regular student	67	84.81	52	85.24
	Irregular student	12	15.18	9	14.75
Activity	Active student	72	91.13	56	91.80
	Inactive student	7	8.87	5	8.19

Table 2. Relationship between students’ satisfaction and engagement (based on traditional classroom data, N=79)

Variables	Students’ Satisfaction	Students’ Engagement
Students’ Satisfaction	1	0.881**
Students’ Engagement	0.881**	1

Note: **correlation is significant at the 0.01 level. (2 tailed).

Table 3: Relationship between students’ satisfaction and engagement (based on flipped classroom data, N=61)

Variables	Students’ Satisfaction	Students’ Engagement
Students’ Satisfaction	1	0.857**
Students’ Engagement	0.857**	1

Note: **correlation is significant at the 0.01 level. (2 tailed).

The result of the above tables 2 and 3 shows that there was a strongly positive correlation between students’ satisfaction and engagement both traditional classroom and flipped classroom. The degree of correlation between

students’ satisfaction and engagement was 0.881 and 0.857 in the traditional classroom and flipped classroom, respectively, which indicates that students with a higher level of satisfaction have a higher level of engagement.

Table 4. Mean differences of students’ satisfaction between male-female, regular-irregular and active-inactive students based traditional and flipped classroom

Variables	Levels	Traditional Classroom, N=79					Flipped Classroom, N=61				
		N	Mean	SD	t-value	p-value	N	Mean	SD	t-value	p-value
Gender	Male	31	28.51	7.98	.49	0.96	21	38.52	3.23	-.92	0.35
	Female	48	28.41	9.99			40	39.48	4.73		
Regularity	Regular	67	28.61	9.38	.38	0.70	52	39.69	3.44	2.49*	0.01
	Irregular	12	27.58	8.44			9	36.00	6.94		

Variables	Levels	Traditional Classroom, N=79					Flipped Classroom, N=61				
		N	Mean	SD	t-value	p-value	N	Mean	SD	t-value	p-value
Activeness	Active	72	28.59	9.20	.41	0.69	56	39.50	3.45	2.22*	0.03
	Inactive	7	27.00	9.81			5	35.20	9.41		

Table 5. Mean differences of students' engagement between male-female, regular-irregular and active-inactive students based on traditional and flipped classroom

Variables	Levels	Traditional Classroom, N=79					Flipped Classroom, N=61				
		N	Mean	SD	t-value	p-value	N	Mean	SD	t-value	p-value
Gender	Male	31	28.64	6.17	-.68	0.49	21	40.00	4.14	-.31	0.75
	Female	48	29.87	9.82			40	40.35	4.31		
Regularity	Regular	67	29.41	8.87	.05	0.94	52	40.79	3.19	2.60*	0.01
	Irregular	12	29.25	6.82			9	37.00	7.41		
Activeness	Active	72	29.55	8.68	.61	0.55	56	40.52	3.39	1.81	0.07
	Inactive	7	27.71	7.49			5	37.00	9.77		

Comparing the two tables above (Tables 4 and 5), it can be seen that in each case, the flipped classroom score has increased significantly over the traditional classroom. Another thing to note is that the traditional classroom cannot differentiate among students, but the flipped classroom differentiates students based on class regularity and class activity.

Based on student satisfaction (table 4), the highest and lowest scores of students in the traditional classroom were 28.61 (regular student) and 27 (inactive student), respectively. But in the case of a flipped classroom, it increases to 39.69 (for regular students) and 35.20 (for inactive students), respectively. So, it can be seen that a flipped classroom helps increase student satisfaction. In the flipped classroom, it was found that there was a significant mean difference based on regularity (regular students mean = 39.69, irregular students mean = 36.00, $t = 2.49$ with $df = 59$, $p = 0.01$, $\alpha = .05$) and active learners (active students mean = 39.50, inactive students mean = 35.20, $t =$

2.22 with $df = 59$, $p = 0.03$, $\alpha = .05$). Additionally, the entire result showed that the mean scores of satisfactions for female, regular, and active students were higher than their counterparts.

Similarly, on the basis of student engagement (table 5), the highest and lowest scores of students in the traditional classroom were 29.87 (for a female student) and 27.71 (for inactive students), respectively. But in the case of the flipped classroom, it increased to 40.79 (for regular students) and 37 (inactive students), respectively. So, it can be clearly said that a flipped classroom helps increase student engagement. In the flipped classroom, it was found that there was a significant mean difference based on regularity (regular students' mean = 40.79, irregular students' mean = 37.00, $t = 2.60$ with $df = 59$, $p = 0.01$, $\alpha = 0.05$). Furthermore, the entire result showed that the mean satisfaction scores of females, regular, and active students were higher than their counterparts.

Table 6. Comparison of students' satisfaction between traditional classroom and flipped classroom based on each item

Items	Traditional Classroom		Flipped Classroom		t-value
	Average (\bar{x})	SD	Average (\bar{x})	SD	
Item 1	2.84	1.09	3.82	.84	5.81**
Item 2	2.90	1.21	3.92	.71	5.84**
Item 3	2.94	1.27	3.93	.60	5.62**

Items	Traditional Classroom		Flipped Classroom		t-value
	Average (\bar{x})	SD	Average (\bar{x})	SD	
Item 4	2.73	1.13	3.74	.81	5.90**
Item 5	2.84	1.01	3.72	.60	6.03**
Item 6	2.56	1.18	4.10	.59	9.32**
Item 7	2.56	1.23	4.16	.84	8.70**
Item 8	2.91	1.14	3.89	.55	6.17**
Item 9	3.06	1.13	4.00	.57	2.52**
Item 10	3.08	1.07	3.87	.59	5.17**

The mean scores, standard deviation and t-value of the student satisfaction questionnaire (Traditional classroom, N=79, Flipped Classroom, N=61; $df=138$, level of significance=0.05)

Calculating t-test by using online t-test calculator from mean and SD

Link: <https://www.graphpad.com/quickcalcs/ttest1.cfm?Format=SD>

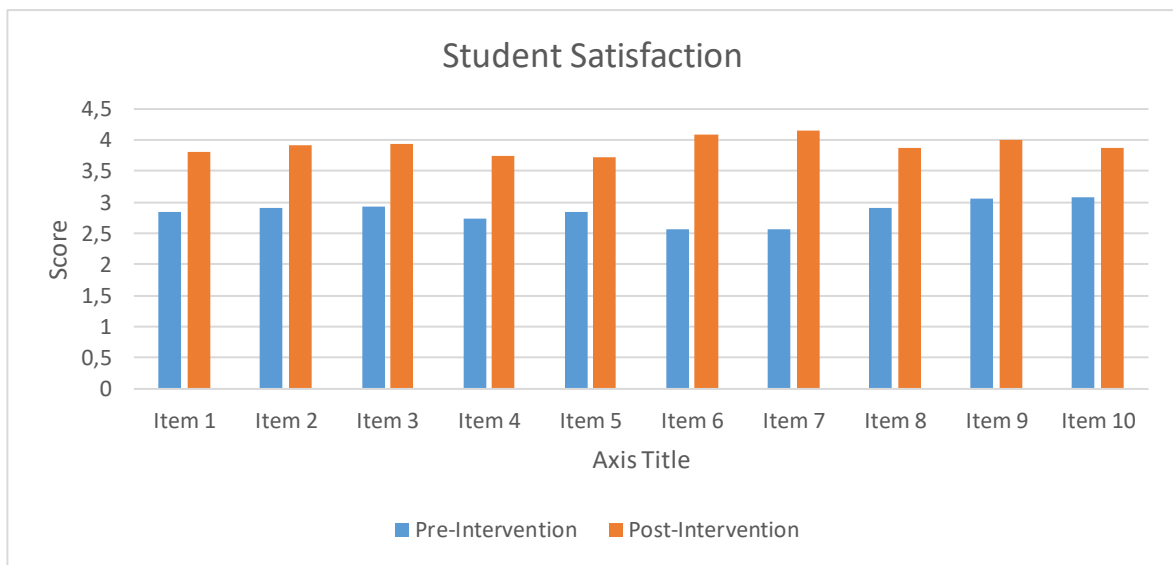


Figure-1. Graphical representation of mean scores of student satisfaction between traditional classroom and flipped classroom

Table 7. Comparison of students' engagement between traditional classroom and flipped classroom based on each item

Items	Traditional Classroom		Flipped Classroom		t-value
	Average (\bar{x})	SD	Average (\bar{x})	SD	
Item 1	3.13	1.19	4.08	.61	5.68**
Item 2	3.27	1.14	4.10	.65	5.08**
Item 3	3.37	1.14	4.16	.58	4.93**
Item 4	2.99	1.09	3.97	.60	6.31**
Item 5	2.99	1.19	3.69	.69	4.09**
Item 6	3.25	1.17	3.85	.74	2.91**
Item 7	2.23	1.18	4.34	.79	12.03**
Item 8	2.94	1.13	3.79	.85	4.89**
Item 9	2.97	1.17	4.00	.60	6.26**
Item 10	2.27	1.19	4.25	.50	12.18**

The mean scores, standard deviation and t-value of the student engagement questionnaire (Traditional classroom, N=79, Flipped classroom, N=61; $df=138$, level of significance=0.05)

Calculating t-test by using online t-test calculator from mean and SD

Link: <https://www.graphpad.com/quickcalcs/ttest1.cfm?Format=SD>

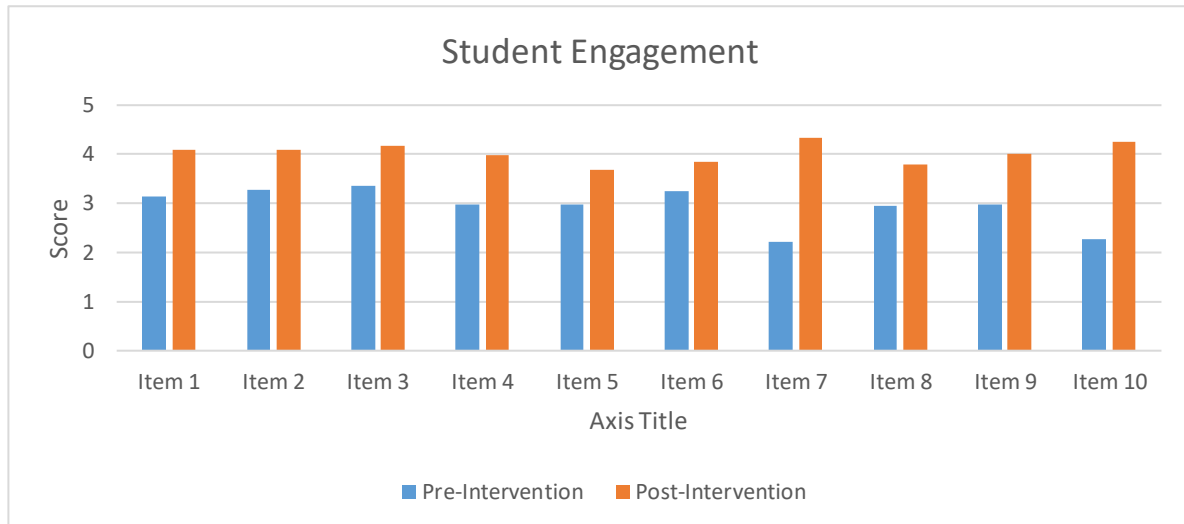


Figure-2. Graphical representation of mean scores of student engagement between traditional classroom and flipped classroom

As can be seen from the results of the *t*-test (Table 6 and 7), there were a significant mean difference between the traditional and flipped classroom in all items, in terms of 0.05 level of significance.

Additionally, the bar chart (figure 1 and 2) compares the mean scores of student satisfaction and engagement of ten items between traditional and flipped classroom result. It was clear that flipped classroom scores were always higher than traditional classroom scores in all items. The biggest difference was observed in items 6 and 7 in figure 1, and item 7 and 10 in figure 2. At the same time, the items were found to have the highest *t*-test values (Table 6 & 7). In the case of item 6, traditional classroom mean = 2.56, SD = 1.18; flipped classroom mean = 4.10, SD = .59 and *t*-value = 9.23 and item 7 (traditional classroom means = 2.56, SD = 1.23; flipped classroom mean 4.16, SD = .84 and 8.70 (Table 6). Similarly, from table 7, in the case of item 7, traditional classroom mean = 2.23, SD = 1.18; flipped classroom mean = 4.34, SD = .79 and *t*-value = 12.03 and item 10 (traditional classroom mean = 2.27, SD = 1.19; flipped classroom mean 4.25, SD = .50 and *t* value = 12.18.

Discussion

The results of the study showed (Table 4) that the flipped classroom environment had a positive impact on student satisfaction compared to the traditional classroom. The highest and lowest scores in the traditional classroom were 28.61 (for regular student) and 27 (for inactive students) while in the flipped classroom that increased to 39.69 (for regular student) and 35.20 (for inactive students). This suggests that the flipped classroom can help to improve student satisfaction. The results also revealed a significant difference in the traditional and flipped classroom. Regular student in the flipped classroom had a mean satisfaction score of 39.69, while irregular students had 36.00. Similarly, active students had a mean satisfaction score of 39.50, while inactive student had 35.20. This result indicates that students who were more regularly engaged in the flipped classroom and those who were more active learners had higher levels of satisfaction. Finally, the overall results showed that female, regular, and active students had higher mean satisfaction scores compared to their counterparts in the flipped classroom.

The data presented in Table 5 indicates that student engagement in a traditional classroom had a range of scores, with the highest scores belonging to female students (29.87) and the lowest scores belonging to inactive students (27.71). In contrast, when students were in a flipped classroom setting, their engagement scores increased, with the highest scores being observed among regular students (40.79) and the lowest scores being observed among inactive students (37). The results suggest that the flipped classroom model has a positive impact on student engagement. The significance of the difference in mean engagement scores between regular and irregular students in the flipped classroom setting was also confirmed by a t-test ($t = 2.60$, $df = 59$, $p = 0.01$, $\alpha = 0.05$). Additionally, the overall results indicate that female students, as well as regular and active students, had higher mean engagement scores than their counterparts in both the traditional and flipped classroom settings. These findings support the conclusion that the flipped classroom approach can enhance student engagement, particularly for certain demographic groups.

The data suggests (Table 6 and 7; Figure 1 and 2) that the flipped classroom approach results in higher levels of student satisfaction and engagement compared to the traditional classroom approach. This is supported by both the t-test results, which show significant mean differences between the two methods for all items at a 0.05 level of significance, and by the bar charts, which visually demonstrate the higher scores achieved in the flipped classroom. The largest improvement was observed in items 6, 7, and 10, which showed the highest t-test values, further emphasizing the significance of the findings. The results indicate that the flipped classroom approach leads to a noticeable improvement in student satisfaction and engagement compared to the traditional approach.

From the above discussion it can be easily said that flipped classroom was more effective than traditional classroom. These findings were consistent with the study of Davies et al., 2013; Fautch, 2015; Hung, 2015; Mason, Shuman, & Cook, 2013; Missildine, Fountain, Summers, & Gosselin, 2013; Schultz, Duffield, Rasmussen, & Wageman, 2014; Strayer, 2012;

Wilson, 2013; & Wang et al., 2022. Additionally, Student satisfaction and engagement increased in flipped classrooms compared to traditional classrooms. These findings were consistent with many studies. Such as Davies et al., 2013; Hung, 2015; Kong, 2014; & Mason et al., 2013. I think that flipped classroom can be acceptable and interesting to students because of diversity of flipped classroom teaching method, providing immediate feedback, use of modern teaching methods (including group work, discussion, presentation), use of modern equipment and internet-based web 2 tools.

Limitations

The study had limitations such as a narrow sample of only honors psychology students, being limited to one institution and location, lacking control over variables, and a short 6-week intervention due to COVID-19. The results would have been more robust if the study involved other subjects, multiple institutions, and a longer intervention time. Additionally, the small sample size impacted of the research, and a larger sample size would have improved these factors.

Conclusion and Recommendation

Modern technology is touching every part of our lives. So, there should be technology-focused teachers, students, and classrooms. Besides, blended learning is a buzzword in educational areas. Talking to teachers and students, it is known that students are less interested, less engaged, and less satisfied in the traditional classroom. In order to address and resolve our instructional issue of student disengagement and dissatisfaction, we preferred a flipped classroom as our intervention. The study has tried to identify student engagement and satisfaction among first-year honors students in the Dept. of Psychology at Rajshahi College in Bangladesh. Two survey was conducted to determine student engagement and satisfaction with traditional and flipped classrooms. The outcome showed that students were more engaged and satisfied in the flipped classroom than in the traditional classroom. According to the study's findings, there was a significant mean difference in student engagement and satisfaction between traditional

classroom and flipped classroom scores. Another outcome to note is that the traditional classroom failed to differentiate students, but the flipped classroom did so base on class regularity and activity. This study will be helpful for administrators of educational institutions to make classes interesting. Education policy-makers can make proper decisions. Finally, this study may help teachers, mentors, and tutors create a successful classroom.

Acknowledgements

This study was conducted as part of the 4-month-long Enhanced Continuous Professional Development (ECPD) Training program (Teachers Training-TT-10), 10th batch, under the supervision of the University of Nottingham, Malaysia (UNU), and the Ministry of Education (Moedu), Bangladesh.

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Appendices

Appendix A: Student satisfaction questionnaire

SL	Questionnaire for Traditional Classroom	Questionnaire for Flipped Classroom
1	The traditional learning helps me learn more.	The flipped learning helps me learn more.
2	The traditional classroom has suitable tools for supporting my learning.	The flipped classroom has suitable tools for supporting my learning.
3	The traditional learning encourages me to have creative thinking and evaluation.	The flipped learning encourages me to have creative thinking and evaluation.
4	I am satisfied with the content, materials and topics of the traditional classroom.	I am satisfied with the content, materials and topics of the flipped classroom.
5	I am satisfied with the format and structure of the traditional classroom.	I am satisfied with the format and structure of the flipped classroom.
6	I am satisfied with whiteboard and marker pen of the traditional classroom.	I am satisfied with multimedia projector (digital classroom) of the flipped classroom.
7	The class method of traditional learning reduces the feeling of boring and tension.	The class method of flipped learning reduces the feeling of boring and tension.
8	The use of the traditional learning helps me to develop useful skills.	The use of the flipped learning helps me to develop useful skills.
9	I enjoy learning the psychology language through the use of the traditional learning.	I enjoy learning the psychology language through the use of the flipped learning.
10	Overall, I am satisfied with the traditional classroom learning experience.	Overall, I am satisfied with the flipped classroom learning experience.

Appendix B: Student engagement questionnaire

SL	Questionnaire for Traditional Classroom	Questionnaire for Flipped Classroom
1	I am more motivated to learn Psychology in the traditional classroom.	I am more motivated to learn Psychology in the flipped classroom.
2	When I am in traditional classroom, I listen everything attentively.	When I am in flipped classroom, I listen everything attentively.
3	I enjoy learning new things in traditional classroom.	I enjoy learning new things in flipped classroom.
4	When we work on something in the traditional classroom, I feel encouraged.	When we work on something in the flipped classroom, I feel encouraged.
5	I ask myself questions to make sure I know the material that I have been studying in the traditional classroom.	I ask myself questions to make sure I know the material that I have been studying in the flipped classroom.
6	When I read the lesson, I ask myself questions to make sure I understand what it is about in the traditional classroom.	When I read the lesson, I ask myself questions to make sure I understand what it is about in the flipped classroom.
7	I like to do the class exam in general way (Paper-pencil, Traditional Method).	I like to do the class exam by online platform (Kahoot, Poll Everywhere)
8	The traditional classroom makes me want to learn more about the topic.	The flipped classroom makes me want to learn more about the topic.
9	I enjoy discussing topics with my peers in the traditional classroom.	I enjoy discussing topics with my peers in the flipped classroom.
10	Flipped classrooms are not enough for me to learn well, I need traditional classrooms.	Traditional classrooms are not enough for me to learn well, I need flipped classrooms.