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SHIFTING THE TRADITIONAL: STUDENT FEEDBACK ON FLIPPED CLASSROOM APPROACH IN LEARNING A STATISTICS COURSE

FARIDAH ZULKIPLI*, NOR ASLILY SARKAM, NOR HAZLINA MOHAMMAD & SITI SALIHAH SHAFFIE

Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA Perak Branch, Tapah Campus, 35400 Tapah Road, Perak*

faridah7368@uitm.edu.my*

ABSTRACT

The contemporary digital era poses a challenge to the national education system, encompassing higher education. Students have developed digital competencies following the COVID-19 pandemic. Educational approach has evolved beyond traditional approaches, necessitating diversity through strategies such as flipped classrooms and blended learning. A flipped classroom (FC) is a way of teaching that flips the usual order of activities for learning. Outside of class, students often learn new things through readings or videos. During class, they use their time to connect with each other through problem-solving, discussions, and group projects. This approach seeks to enhance classroom engagement and concentrate on the application of information. This study aims to examine students' feedback on the implementation of flipped classroom (FC) approach in the Statistics course. This pilot study included 111 selected students from FSKM, FSG, and FP as respondents. A set of questionnaires was provided to them. 71% of the respondents are female, while 29% are male. Consequently, over 90% of students concurred that flipped classroom (FC) is beneficial in the teaching and learning process, enhances comprehension, augments concentration, and immediately elevates their performance in statistics courses. Most respondents perceive FC as facile, straightforward, and user-friendly. Consequently, the versatility of FC across various educational levels enhances economic potential and serves as an alternative approach for fostering diversified learning environments.

Keywords: *Flipped Classroom, Students' Feedback, Statistics Course*

INTRODUCTION

Currently, technological advancements compel educational institutions to develop and execute new pedagogical models in the design and implementation of teaching and learning activities (Colomo-Magana et al., 2021; Li, 2018; Wenming & Erwen, 2018). To tackle these problems and improve student involvement, changes in teaching methodologies and classroom environments have been investigated (Abramson, 2010; Marantz et al., 1991; Mustafa & Yilmaz, 1996). The flipped classroom (FC) technique is a promising strategy in which students engage with course information and assignments prior to class, hence facilitating active learning and collaboration during class time (Hew & Lo, 2018). FC is one of the innovative approaches used in modern education. This model has shifted the role of the classroom from a learning space to an interactive discussion arena. The application of the FC can provide learning encouragement to students, especially to improve the ability of self-regulated learning by students. With this, students' ability for proactive participation is seen (Trisnayanti & Wijayanto, 2025). Nevertheless, the role of the teacher is very important in teaching and utilizing digital media (Yusuf, 2025). Teaching a statistics course is not an easy task due to difficulty on understand the statistical concepts and process of statistical analysis. Statistics course consist of activities that are used to gather data, summarize, or show data, analyze data using certain methods, and make sense of the results of the analysis (Sugiyono, 2016). The Flipped Classroom model can improve student learning outcomes and self-esteem because it encourages more contact between students and teachers, maximizes student accountability, makes class time more effective, and allows students to learn on their own in exploring online learning resources to encourage motivation and interest in completing as many projects as possible (Fedistia & Musdi, 2020). Figure 1 illustrates the differences approaches on FC and traditional. Therefore, this study is conducted to examines the implications of the flipped classroom method on students' feedback and their satisfaction with the learning experience on selected topic in statistics courses.

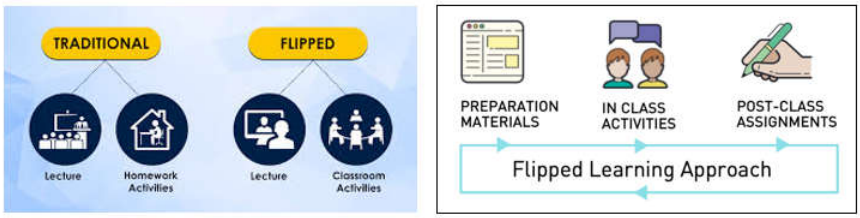

Figure 1.: Flipped Classroom and Traditional Approach

METHODOLOGY

This study begins with providing the students with video on Statistics course a week before the in-class session. The students are assigned to work in group for a tutorial assignment based on the selected topic. Then the discussion session conducted in-class with two ways of communication between the lecturer and students. After that, a set of questionnaires on the feedback of students towards the implementation of the flipped classroom are distributed after the completion of class activities. The feedback of students is assessed on usefulness of flipped classroom and the benefit of using the flipped classroom. This study focused on statistics courses which are taught to students from the Faculty of Computer and

Mathematical Sciences (FSKM), the Faculty of Applied Sciences (FSG), and the Faculty of Accountancy (FP). Figure 2 depicts subtopics shared with all the students prior to the actual class. In class, the lecturer may vary the activities that involve students.

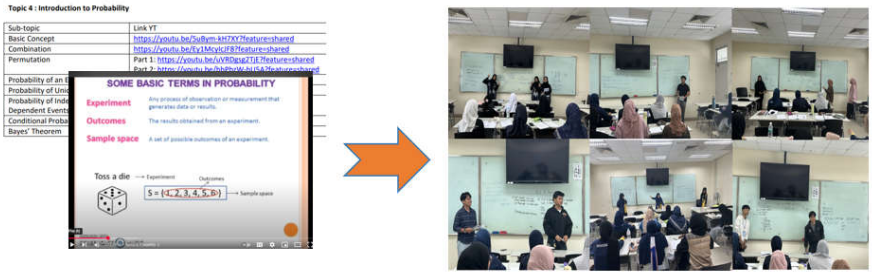

Figure 2.: Process of Implementing the Flipped Classroom

RESULTS AND DISCUSSION

Table 1 presents a descriptive analysis of the background of respondents based on gender, faculty, technology skill, and internet coverage.

Table 1.: Descriptive Analysis on Demographic

Variables	Category	Number of Respondent	Percentage (%)
Gender	Male	32	28.83
	Female	79	71.17
Faculty	FSKM	53	47.75
	FSG	41	36.94
	FP	17	15.31
Technology Skill	High	59	53.15
	Moderate	52	46.85
	Poor	0	0
Internet Coverage	Excellent	21	18.92
	Fair	80	72.07
	Poor	10	9.01

Most respondents are female (71.17%), while males represent only 28.83%. Regarding faculty distribution, the largest proportion of respondents are from the Faculty of Computer and Mathematical Sciences (FSKM), accounting for 47.75%, followed by the Faculty of Applied Sciences (FSG) at 36.94%, and the Faculty of Accountancy (FP) with 15.31%. In terms of technology skill levels, over half of the respondents (53.15%) rate their skills as high, while 46.85% identify as having moderate skills. Notably, no respondents reported having poor technology skills, indicating a relatively tech-savvy sample population. On the factor of internet coverage, most respondents (72.07%) report having fair internet access, while 18.92% describe their coverage as excellent. Only a small percentage (9.01%) experience poor internet coverage. Therefore, the data indicate a predominantly female group of respondents with strong representation from FSKM and generally good technology proficiency. However, internet quality varies, with the majority experiencing only fair connectivity, which may impact their digital experiences and performance. This background information provides important context for interpreting further findings in the study.

Table 2 presents a summary of students' feedback on the flipped classroom approach, categorized into two main areas: Usefulness of Flipped Classroom and Benefit of Flipped Classroom. The data reflect students' agreement levels across 10 statements in the usefulness of FC and 10 statements in the Benefit of FC, with response options ranging from "Strongly Agree" to "Strongly Disagree".

Table 2.: Summary on Students' Feedback of Flipped Classroom

Usefulness of Flipped Classroom	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
Flipped classroom are useful in teaching and learning process	38	71	2	0
The use of flipped classroom would improve learning performance	34	68	8	1
Learning will be more productive with the use of flipped classroom	40	61	8	2
Using flipped classroom will save time	43	58	10	0
Flipped classroom when judiciously adopted gives successful and effective learning	30	74	7	0
It has increased my reasoning ability	34	69	7	1
Flipped classroom enhances student participation in the course content	37	63	11	0
The use of flipped classroom enhances interaction with peers and lecturers	38	61	9	3

Flipped classroom improves exposure to relevant educational media	44	59	8	0
Using flipped classroom arouses interest for learning	39	66	6	0

Benefit Of Flipped Classroom	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
Flipped classroom are easy to use for learning	32	69	10	0
Flipped classroom are simple to use for learning	36	71	4	0
Flipped classroom are user friendly	38	67	6	0
I learned to use flipped classroom quickly for learning	31	73	7	0
I quickly remember how to use flipped classroom for learning	32	69	10	0
Flipped classroom make my work faster	28	66	17	0
I became more skillful with using flipped classroom for learning	31	66	14	0
My interaction with other students using flipped classroom is understandable	37	64	8	2
I can use flipped classroom for learning without any written instructions	25	67	17	2
I recover from mistakes quickly when I use flipped classroom for learning	31	71	7	2

Students generally perceive the flipped classroom as highly useful in enhancing the teaching and learning process. For example, 38 students "strongly agree" and 71 "agree" that flipped classrooms are useful in teaching and learning, indicating over 90% positive feedback. Similarly, 34 students "strongly agree" and 68 "agree" that this approach improves learning performance. The highest level of strong agreement (43 students) is observed in the statement "Using flipped classroom will save time," followed closely by productivity and reasoning ability enhancements. Notably, the flipped classroom is also seen to boost participation, peer interaction, and interest in learning, with combined agreement levels (strongly agree + agree) consistently above 90% for all statements in this section. Very few students expressed disagreement, and none strongly disagreed for most items. In terms of usability and perceived benefits, feedback remains largely positive. For instance, 32 students "strongly agree" and 69

"agree" that flipped classrooms are easy to use for learning. Simplicity, user-friendliness, and quick learning of how to use the system also received high agreement rates. Statements like “I quickly remember how to use flipped classroom for learning” and “I became more skilful with using flipped classroom for learning” both had a combined agreement rate of 94%, showing effective adaptation. Additionally, students reported that flipped classrooms make work faster (28 strongly agree, 66 agree) and that they could use the platform without prior instructions. Only a small minority disagreed or strongly disagreed, generally not exceeding 3 or 4 students per item. As a result, the descriptive statistics show overwhelmingly positive student perceptions of the flipped classroom in terms of both its utility in educational outcomes and its ease of use. The high frequencies of “strongly agree” and “agree” responses across all items underscore the effectiveness of the flipped classroom model in improving engagement, learning efficiency, and student satisfaction. Low disagreement levels further reinforce this, suggesting minimal resistance or challenges in adopting the model. This feedback supports broader implementation of flipped classroom methodologies in diverse learning environments.

CONCLUSION

The findings from both tables offer valuable insights into the student demographic and their perceptions of the flipped classroom model. Most of the respondents are female and primarily from the Faculty of Computer and Mathematical Sciences, with most reporting moderate to high technological skills. Although internet access is generally fair, this variability in connectivity may affect the consistency of their digital learning experience. Nevertheless, the overall technology skill of the participants provides a solid foundation for adopting digital learning methods like the flipped classroom. Overwhelmingly positive feedback on the usefulness and benefits of the flipped classroom approach. Students widely agree that it enhances learning effectiveness, increases productivity, improves reasoning, and supports better interaction with peers and instructors. The approach is also seen as time-saving, user-friendly, and easy to learn. High levels of agreement across all evaluated aspects, which were combined with minimal disagreement and suggest strong student acceptance and satisfaction. Collectively, the data highlight that a largely capable and well-prepared student population is positively responding to flipped classroom methods. These insights support the continued and possibly expanded use of flipped classroom strategies in higher education settings, particularly where technological readiness among students is already high, ensuring more effective and engaging learning experiences.

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