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International Teaching Aid
Competition 2023
Reconnoitering Innovative Ideas in Postnormal Times

iTAC
2023

iTAC 2023
INTERNATIONAL TEACHING AID COMPETITION
E-PROCEEDINGS

PREFACE

iTAC or International Teaching Aid Competition 2023 was a venue for academicians, researchers, industries, junior and young inventors to showcase their innovative ideas not only in the teaching and learning sphere but also in other numerous disciplines of study. This competition was organised by the Special Interest Group, Public Interest Centre of Excellence (SIG PICE) UiTM Kedah Branch, Malaysia. Its main aim was to promote the production of innovative ideas among academicians, students and also the public at large.

In accordance with the theme "Reconnoitering Innovative Ideas in Post-normal Times", the development of novel ideas from the perspectives of interdisciplinary innovations is more compelling today, especially in the post-covid 19 times. Post-pandemic initiatives are the most relevant in the current world to adapt to new ways of doing things and all these surely require networking and collaboration. Rising to the occasion, iTAC 2023 has managed to attract more than 267 participations for all categories. The staggering number of submissions has proven the relevance of this competition to the academic world and beyond in urging the culture of innovating ideas.

iTAC 2023 committee would like to thank all creative participants for showcasing their innovative ideas with us. As expected in any competition, there will be those who win and those who lose. Congratulations to all the award recipients (Diamond, Gold, Silver and Bronze) for their winning entries. Those who did not make the cut this year can always improve and join us again later.

It is hoped that iTAC 2023 has been a worthy platform for all participating innovators who have shown ingenious efforts in their products and ideas. This compilation of extended abstracts published as iTAC 2023 E-Proceedings contains insights into what current researchers, both experienced and novice, find important and relevant in the post-normal times.

Best regards,

iTAC 2023 Committee
Special Interest Group, Public Interest Centre of Excellence (SIG PICE)
UiTM Kedah Branch
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A GUIDELINE: IMPLEMENTATION OF THE FLIPPED CLASSROOM TEACHING APPROACH IN LEARNING STATISTICS

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ABSTRACT

Nowadays, statistics can be viewed as the most important science in the world because every other science depends on statistics for its practical applications. This has led to making statistics a core subject in Malaysian higher education institutions and requiring students from other courses to take this subject in their studies. However, the majority of students may find it challenging to use statistics and understand the results. In order to reduce the challenges, lecturers should motivate their students and implement a new teaching strategy in their lessons with the intention of having more adaptive classes. A flipped classroom teaching approach is one of the methods to solve this problem. The flipped classroom provides students direct access to online educational platforms' video lectures, slideshows, and other instructional resources. The combination of classroom activities and online learning experiences outside the class will enhance students' learning motivation and attitude more than traditional teaching. It solves the majority of problems faced by absent students who are missing classes by referring to the recorded video, which can be accessed anytime and anywhere. Based on one survey, we found that more than half (74%) of the respondents opted for the flipped classroom, while only 26% of the respondents preferred the traditional classroom. The main reason is that the recorded videos can be watched repeatedly by students at their own pace. Therefore, this guideline is meant to help educators plan for a flipped classroom in preparing materials for the statistics subject and choosing tools that suit this approach.

Keywords: flipped classroom, traditional classroom, teaching, learning, statistics

INTRODUCTION

Nowadays, the majority of undergraduate students in a wide range of majors must take a statistics course. It is necessary for all undergraduate students, not only those specialising in statistics or mathematics. Majors in biology, engineering, sociology, and many other fields are also required (Doyle, 2017). This has led to making statistics a core subject in higher education institutes in Malaysia and requiring students from other courses to take this subject in their studies (Ashaari et al., 2011). Statistics can be considered the most important science in the world because every other science depends on statistics for its practical applications (Ridgway et al., 2007). According to Male et al. (2021), university students may find it challenging to use statistics and understand the results. Some of them claimed it was challenging to comprehend

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2023

the data when reading statistics from tables. They required extra time to concentrate on the calculations and translate the verbal results of the numbers. Nonetheless, students must understand and research this topic because they will be applying statistics concepts in their final report. In order to reduce the challenges, lecturers should motivate their students and make an effort to use a variety of straightforward but engaging teaching strategies when teaching statistics. In learning statistics, students must be able to understand the statistical terms and concepts, deal with a large amount of data, and analyze the data using several statistical packages such as SPSS, Excel, MINITAB and R programming. Based on a previous study, the majority of students may have difficulty operating the statistics and reading the results obtained even in a live class (Saidi et al., 2019; Male et al., 2021). Thus, lecturers need to implement a new teaching strategy in their lessons with the intention of having more adaptive classes. The combination of classroom activities and online learning experiences outside the class will enhance students' learning motivation and attitude more than traditional teaching. Through blended learning, it can be used in designing learning activities, student interactions, and lecturers' interactions. At the same time, students can adapt to the learning process according to their particular learning pace. A flipped classroom teaching approach is one of the methods to solve this problem. Based on Strayer (2012), the flipped classroom approach is a special type of blended learning. A flipped learning strategy combines traditional classroom instruction with other components, such as online study outside the classroom, to provide students with a comprehensive education (Fleck, 2012). The flipped classroom, which gives students direct access to online educational platforms' video lectures, slideshows, and other instructional resources, has gradually grown in popularity and significance (Bergmann and Sams, 2012). According to Chou et al. (2021), a flipped learning classroom increases interest in learning, improves learning efficiency, and encourages creativity in turning passive learners into active ones.

Therefore, a survey was conducted among students taking statistics courses this semester. A total of 140 students are involved in this study. The objective of this study is to determine the preference of students between the traditional method and the flipped classroom method, as well as to improve students' understanding of learning statistics by providing them with a new platform. This study can provide lecturers with a guideline for managing a flipped classroom approach that helps cater to students' various needs. This method can also help solve most problems faced by absent students who are missing classes. They can refer to the recorded video, which can be accessed anytime and anywhere.

MATERIALS AND METHODS

A study was conducted at Universiti Teknologi Mara (UiTM) Johor, Campus Segamat. It consisted of 180 students from six classes who participated in this study. These students were selected since they are taking the statistics subject in the current semester. Only 140 students were selected at random by giving their cooperation and completing an online questionnaire

using Google Forms. This questionnaire was developed in order to identify the preferences of students between the traditional method and the flipped classroom method.

The flipped classroom approach has been used in teaching statistics, where a combination of live lectures (face-to-face) and recorded videos are used throughout the learning process. The flow of the flipped classroom approach is shown in Figure 1. Based on this figure, it consists of three phases: (1) before the class, (2) in the classroom, and (3) after the class.
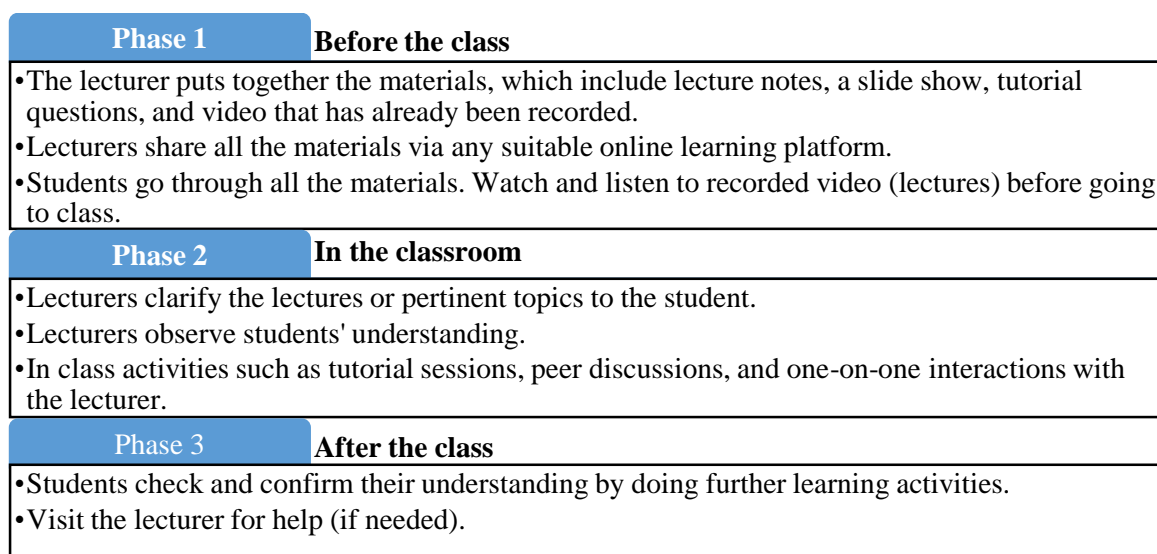
Phase 1	Before the class
•The lecturer puts together the materials, which include lecture notes, a slide show, tutorial questions, and video that has already been recorded. •Lecturers share all the materials via any suitable online learning platform. •Students go through all the materials. Watch and listen to recorded video (lectures) before going to class.	

Phase 2	In the classroom
•Lecturers clarify the lectures or pertinent topics to the student. •Lecturers observe students' understanding. •In class activities such as tutorial sessions, peer discussions, and one-on-one interactions with the lecturer.	

Phase 3	After the class
•Students check and confirm their understanding by doing further learning activities. •Visit the lecturer for help (if needed).	

Figure 1: Flow of the Flipped Classroom Approach

In the first step, the lecturer should compile a list of any parts of the statistics course that must be completed by a certain date. The lecturer must then inform the class of the weekly topics and assignments. The lecturer can then begin putting together things like lecture notes, a slide show, tutorial questions, and videos that have already been recorded. The lecturer can utilise a variety of programmes and tools to create these materials, including Microsoft Word, Microsoft PowerPoint, Adobe Reader, Kahoot, and Quizziz, to create tutorials. The lecturer has the option to record the live lecture using Screencast-O-Matic, Microsoft PowerPoint screen recording, or others. Afterwards, the lecturer must upload all the materials via any suitable online learning platform such as YouTube, Google Classroom, Microsoft Team, U-Future, or mail the video using a USB drive. WhatsApp or Telegram are also recommended platforms for material distribution. Then, the students must prepare to participate in the class activities by reviewing all the materials before class. They need to watch a corresponding online lecture video, assimilate the learning content, and concentrate more on the statistical concepts, formulas, and calculations in certain topics. The students can jot down questions for future discussion or prepare questions about the parts they do not understand and take notes. In other words, in the

flipped classroom, readings and online lectures serve as students' initial exposure to the course material before they even step foot in the classroom.

In the second phase, the students explore and practice what they have learned with the support and guidance of the lecturer. Lecturers will clarify the lectures or pertinent topics to the students, especially about the statistical method used. The remainder of the class is spent on exercises designed by the lecturer to encourage a deeper comprehension of a statistical concept. At the same time, the lecturers will observe students understanding by conducting some activities in class, such as tutorial sessions, peer discussions, and one-on-one interactions with the lecturer and answering the questions that they prepared before the class. The lecturers need to explore different assessment methods and exercises to determine how much learning has taken place in order to assess students' understanding. These activities will improve the students understanding of each topic covered in the statistics subject, especially how to manipulate data, perform calculations, and use formulas. Besides that, the discussion about tutorial questions during class should be implemented to evaluate students' understanding, skills, and content taught in those topics, as well as how well they are able to absorb the knowledge given during the lecture. Students should receive feedback based on the tutorials in which they have participated so they can identify their weaknesses and strengths in those topics. In this phase, the engagement between the lecturer and students is very important, especially with weak students, to know their understanding of the learning and teaching process and gauge how much learning has taken place.

Lastly, in the third phase, the lecturers will assess whether students have learned anything by analysing independent work, homework, quizzes, or test results. From the evaluation, the lecturers need to decide whether they can speed up, slow down, or repeat a lesson. The students must check and confirm their understanding by doing further learning activities. If they do not understand, they may seek clarification from the lecturers. If all students give positive feedback, the lecturer can proceed to the next topic. This flipped classroom approach shifts learning responsibilities from the lecturer to the student. So, it can help the students understand more about statistical concepts.

FINDINGS

There are 140 respondents involved in this study. These respondents are Statistics students in the current semester. Table 1 shows the result of the respondents' preference for their learning method.
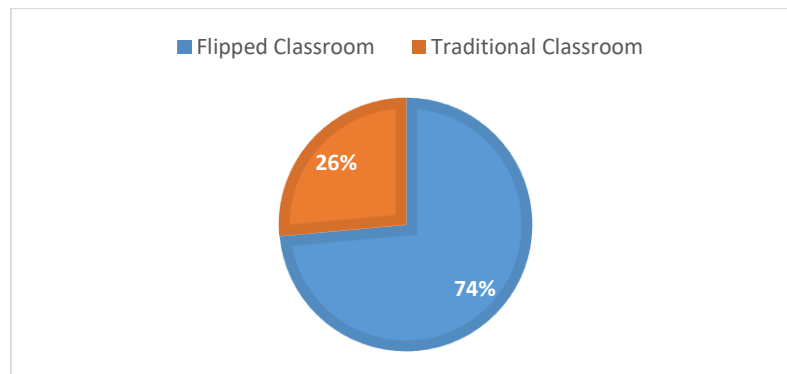
Figure 1: Respondents' Preference for Learning Method

More than half (74%) of the respondents opted for the flipped classroom approach, while only 26% of the respondents preferred the traditional classroom. Figure 2 shows the main reason for the preferred flipped classroom method. The top reason, as voted by 40.7% of respondents, was because recorded videos can be watched repeatedly at their own flexible time. Aside from that, another 22.1% of respondents believed that this flipped classroom approach would allow them to learn at their own pace.
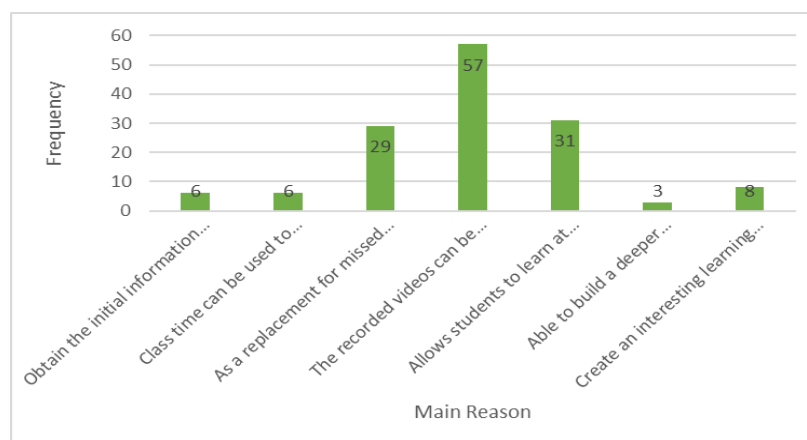

Figure 2: The Main Reason For Choosing The Flipped Classroom Method

CONCLUSIONS

In conclusion, this guideline is intended to assist educators in planning a flipped classroom approach in preparing materials for the statistics subject and choosing tools that suit this approach. It can assist the lecturers in delivering teaching and learning in the flipped classroom approach. The lecturer should have confidence in the students' ability to learn in flipped classrooms as long as the platform is accessible and the content and teaching materials are

interesting, attractive, and interactive. This approach also can help the students understand more about basic statistical concepts with good planning and the right platform for teaching and learning in a face-to-face and online environment that can be accessed anytime and from anywhere.

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