

The Effect of Flipped Instructional Plan on Student Performance

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To Link this Article: <http://dx.doi.org/10.6007/IJARBS/v11-i10/11087> DOI:10.6007/IJARBS/v11-i10/11087

Published Date: 03 October 2021

Abstract

This study is divided into two phases; development and validation of the instructional plan, and evaluation of student's performance. In phase one, a flipped classroom instructional plan was developed for four topics of Management Accounting course. The content and learning activities in the instructional plan were based on the Malaysian Ministry of Education Curriculum Specifications for the Matriculation Department and also the First Principle of Instruction. The verification process had been conducted by three experts. The Percentage Calculation Method (PCM) was utilised to analyse the experts' choice. The results of the expert evaluation showed that the overall PCM value of content validity was 93.33%. In phase two, a quasi-experimental design was conducted with 80 students enrolled in Management Accounting course. The students were split into two groups: one for the experimental group and one for the control group. The experimental group was taught using a flipped classroom strategy, while the control group was taught using a traditional strategy. According to the findings of the t-test analysis, students in the flipped classroom demonstrated significantly higher levels of achievement than students in the traditional group. The findings indicate that a flipped classroom instructional plan can be utilised to improve performance among students.

Keywords: Instructional Plan, Flipped Classroom, First Principle of Instruction, Matriculation College, Management Accounting.

Introduction

Learning at the matriculation college is an important stage as a preparation for students to continue their studies at the university. In the period of a year, the student needs to adapt himself to a learning system which is different from the one at school. A good qualification at matriculation level is the main criterion for students to be able to choose a study course of their liking. To achieve this, the education institution and the lecturers face a huge challenge. This is because they need to ensure at the early stage that the education process can provide an opportunity to the students to explore, mix and interact with people from different walks of life. The educator also plays a part in determining the students' success or failure in learning (Nidzam et al., 2016). The inculcation of 21st century skills would enable the students

to face a life full of global challenges. Nevertheless, currently, some educators are still using the conventional method of teaching which is “*chalk and talk*”.

The learning environment for the accounting subject at the matriculation college is still focused on conventional learning which targets the students’ achievement in examinations. This exam-based and textbook-based system has often been debated as it is not the adequate instrument for developing the best accountant in the future (Kassim, 2014). The effect can be seen in the students’ decreasing motivation to learn. An evidence for this can be seen during the Accounting learning session where the students did not prepare for the lesson and they also did not submit the given assignments. Lizawati et al (2017) found that the matriculation students’ motivation was at a low level as the teaching approach utilised by the lecturer could not change the students’ perception in developing their interest towards the subject. Many of the low-performing students showed low motivation in learning and they seemed helpless to participate in class (Jian, 2019). On the other hand, students with excellent academic achievement and familiar with the textbook contents would probably think that classroom learning is too easy.

In this case, the educators should change the teaching approach in order to motivate the students to become more active and effective. Rafliis (2014) in his study stated that the teaching of Financial Statement Analysis conducted in a conventional way by teachers was considered as unsatisfactory. The conventional teaching which was not student-centred caused the students to feel stressful as they had to remain passively without any activities. This situation also occurred in the matriculation college during the teaching of the accounting subject. The students found it difficult to give their response to the teachers’ questions, they were also passive during the discussion and looked bored. Osman and Jamaludin (2014) suggested flipped classroom learning to create a conducive environment which could support the learning process and improve the students’ involvement level especially in solving problems. Furthermore, the approach also could increase the students’ cognitive and emotional involvement.

Additionally, all factors such as motivation, involvement, self-directed learning, and social interaction are all related and influence the students’ achievement. For example, the interaction between the educator and students would lead the latter to study more about self-directed learning and this, in turn, improves the learning output (Sun, Xie & Anderman, 2018). In the matriculation college, the Accounting subject involves the process of understanding concepts and demonstrating the work for a specific topic and there might not be enough time for other activities. McNally (2017) stated that there was not enough time to cover the teaching and learning and the course content and this caused the students to have low achievement. The Accounting subject requires students to understand the concepts and have a good learning approach so that they could understand the subject better. Some students show good achievement in the Accounting subject even though they do not have basic knowledge or early exposure in the subject (Syazwani & Barieyah, 2018). However, there are still others who face problems in understanding the subject. Furthermore, the students are relatively unexposed to the topics in Management Accounting.

These issues prompt a teaching method which could increase students’ achievement in the accounting subject. The inculcation of the flipped classroom can help students to understand

the teaching environment, to enable a student-centred learning environment and to provide opportunities for students to develop the motivation to study (Jian, 2019). The flipped classroom is the latest approach in teaching and learning and it is utilised for improving achievement, motivation, involvement, higher-order thinking skills and experiential learning (Cakiroglu & Ozturk, 2017). It is a student-centred approach in which the students become more active during the classroom activities. Sams and Bergmann (2013) stated that the teacher functions as the facilitator to motivate, guide and provide feedback to the students. The implementation of flipped classroom enables students to watch videos according to their own needs. This can improve students' collaborative learning via the distance learning mode. As such, during the learning process, students become more focused on solving problems individually or in groups rather than listening to lectures or descriptions. The flipped classroom can also improve the technology usage skills of lecturers and students. Furthermore, the lecturers would be able to utilise various media technology in their teaching (Kurt, 2017).

The flipped classroom is developed based on the web-based lectures which have been followed by the students before the face-to-face learning. Many researchers have stated that the flipped classroom experience provides a positive effects on students' learning compared to the conventional method (Albert & Beatty, 2014; Roach, 2014). Previous studies show that the students are more prepared to involve themselves in more face-to-face activities such as problem-solving, discussion and debates (Gaughan, 2014). Additionally, Fauzan and Ngabut (2018) added that the educators could provide instant response when the students are involved in the learning activities for a higher Bloom taxonomy level during the face-to-face session. Furthermore, students at the matriculation college are among the so-called Z generation who favour technology usage. The environment experienced by the Z generation has shaped this group to think differently compared to the previous generation (Rothman, 2016). Generally, the structure of their thinking makes them more accepting of visual and practical learning such as interactive games, collaborative projects and the challenge element in tasks, compared to the class mode (lectures) and discussion (Rothman, 2016; Cilliers, 2017). As such, the reality requires the latest pedagogical trend and model to fulfill 21st century students' learning needs and requirements.

Research Objectives

The study objectives are stated below:

- To develop an instructional plan for the Management Accounting topic using the flipped classroom approach based on First Principle of Instruction (Merrill, 2002).
- To determine the content validity of the instructional plan.
- To compare students' performance between flipped classroom instruction and traditional classroom instruction.

Methods

This study is divided into two phases; development and validation of the instructional plan, and evaluation of student's performance. In the first phase, the instructional plan is developed based on the approach put forward in First Principle of Instruction (Merrill, 2002). The table below shows the approach which forms the basis for the development of instructional plan.

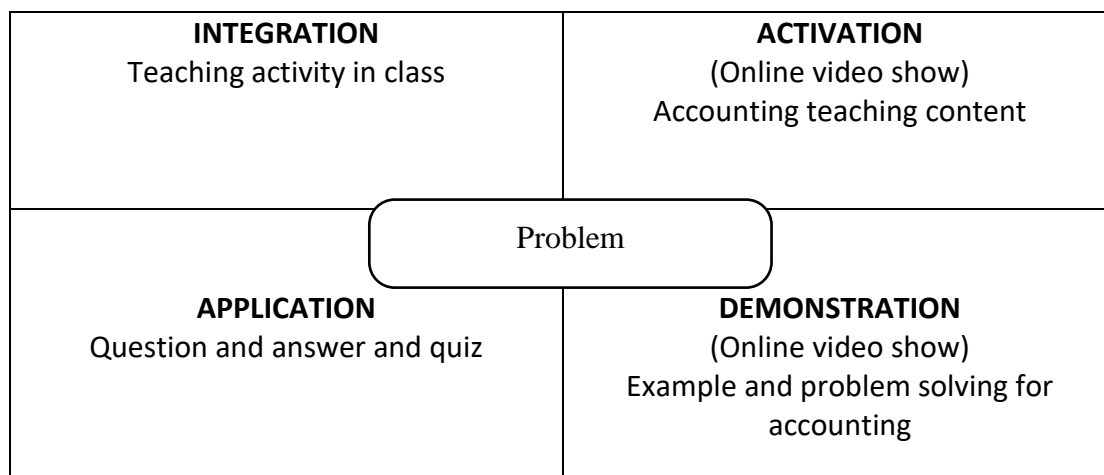


Figure 1: Adaptation of the approach from First Principle of Instruction (Merrill, 2002)

In this study, the students' learning outside the classroom occurs via the video show which involves the activation, demonstration, and application. In the activation stage, students will watch a few videos shows or mini lectures for certain topics at home. The lecturer would provide some tasks which should be completed by the students at the end of each video show. The video show in this phase functions to activate the students' previous learning by recalling concepts or relevant information acquired in the past. In the demonstration phase, the lecturer would show the video related to the new knowledge, strategies, and procedure for solving an accounting problem. These videos and mini lectures could be viewed by the students frequently so that they would be able to understand the subject content. After viewing the videos, the students could apply their knowledge and understanding by answering the quiz and easy questions available online. The online quiz and questions can help the lecturer to check the students' knowledge by analysing the answers before the classroom learning is implemented

During the classroom learning, the activation, application, and integration phases have been included. In the activation phase, the teacher would comment on the topic to be shown and if there were any misunderstanding, he would clarify the matter. After that, the students would apply the concept to be studied by answering a few easy questions either individually or in pairs. Next, in the integration phase, the students need to solve more complex questions in groups. The group discussion can help them to understand in depth and they can integrate their new knowledge into the real situation (Warter-Perez & Dong, 2012).

The topics involved for the instructional plan were Manufacturing Overhead, Job Order Costing, Process Costing dan Absorption Costing and Marginal Costing. The instructional plan was developed based on the Curriculum Specifications and First Principle of Instruction (Merrill, 2002) using the flipped classroom approach. The Content Validity Index (CVI) questionnaire was utilised to get the experts' feedback about the instructional plan. The questionnaire was adapted from a content validity questionnaire by (Sidek and Jamaluddin, 2005). Three evaluation experts were appointed a Subject Matter Expertise (SME) lecturer from the accounting course of the matriculation college, an expert lecturer in e-learning and a counselor in the State Education Department. The experts' evaluation aimed to assess the suitability of the instructional plan in achieving the objectives required. The content validity of the instructional plan was analysed using the Percentage Calculation Method (PCM).

In the second phase, we conducted a quasi experimental study at a matriculation college in Malaysia to investigate the performance of a control and a treatment (experimental) group of students in Management Accounting course. This research was carried out over 10 weeks from mid February to the end of April 2021. The participants of this study comprised 80 students selected from two different classes, 40 students from the flipped class and 40 students from lecture-based class. The flipped classroom was considered as an experimental group, while the lecture-based classroom was a control group.

Initial preparations were made by providing information on the implementation of flipped instructions to lecturers and students in the treatment group one week before the intervention. Both the control and treatment group were given a pre-test (O1) in the following week. The intervention activities were administered from week 3 to 9. Students in both groups underwent a post test (O2) to assess their achievement in week 10. Student performance was measured using achievement test developed by the researchers based on the final exam questions of the previous semesters. The questions focuses only on the materials from four topics as stated above, comprised mostly of problems and short answer questions.

Findings

The panel of expert evaluators had analysed and scrutinised the instructional plan by filling in the Content Validity Index (CVI) questionnaire. A complete copy of the instructional plan which contained the introduction, objectives, overall content, and appendix was given to the experts as their reference. As stated by Russell (1974), a module or in the context of this study, an instructional plan has validity when it fulfills these five condition: it meets the target population, method of implementation, sufficient time for implementation, successful increment of the desired variables and successful transformation of attitudes in a more positive direction. Table 1 shows the total percentage of fit for the instructional plan validity by item.

Table 1

Total Percentage of fit for the Instructional Plan Validity by Item

No	Statement	Percentage of fit
1	The contents of the Instructional Plan meet the target population	100%
2	The contents of the Instructional Plan could be fully implemented	93%
3	The contents of the Instructional Plan were implemented in sufficient time	87%
4	The contents of the Instructional Plan could increase students' motivation and involvement	87%
5	The contents of the Instructional Plan could increase students' achievement	100%

The evaluation scale was a 5 point scale from 1 = very much disagree to 5 = very much agree. To determine the content validity level of Instructional Plan, the score to be filled in by the experts (x) would be divided by the total number of scores (y) and multiplied with 100. An instructional plan has high content validity if it achieves 70 percent and it is assumed that it has achieved a high achievement level (Tuckman, 1981; Sidek & Jamaludin, 2005). The calculation of the PCM is as the following:

$$\frac{\text{Total experts' scores } (x)}{\text{Total actual scores } (y)} \times 100\% = \text{Content validity level}$$

The data from the experts' evaluation found that the Instructional Plan for the Management Accounting topic was suitable using the Flipped Classroom approach. However, the experts had also given a few comments and suggestions for the Instructional Plan to ensure that it could be implemented successfully. The values given by all the experts were utilised to calculate the content validity. Table 2 shows the findings from the experts:

Table 2

Validity Findings from the Experts Regarding the Instructional Plan

Experts	Percentage	Score	Experts' Views
A	96%	24	Accepted
B	92%	23	Accepted
C	92%	23	Accepted
Content Validity Achievement (100%)			93.33
Content Validity Coefficient (1.00)			0.93

As such, the validity value for the Instructional Plan was 93.33%. According to Tuckman (1981) and Noah (2005), the content validity of 70% and above was considered as high level of achievement. As such, it could be stated that the Instructional Plan developed had a high level as its content validity value exceeded 70% at 93.33%. The experts chosen had evaluate and agreed that the instructional plan was suitable to be utilised and implemented.

We examined pre-test and post-test scores to understand the differences in students' performance between flipped and traditional instruction. The t-test was used to analyse the data from the pre-test and post-test scores. Data were examined to check if the variables are normally distributed using Shapiro-Wilk test. Test of normality results show that there are no problems with normality (p -values > 0.05) which implies that the data for this study was considered adequate for parametric tests.

An independent sample t-test was used to compare the pre-test of the experimental and control group. The results of the study were insignificant ($t = .365$, $df = 78$, $p > .05$). There were no differences between the control and treatment groups of students in terms of student performance levels. It was found that the control group and the treatment group had no difference in pre -test mean for student achievement.

Table 3

Result of the independent t-test for the Experimental and Control Group after treatment

	Experimental (n=40)		Control (n=40)		Mean Diff	t	df	pvalue
	Mean	SD	Mean	SD				
Post-test total	79.9	9.28	66.45	11.02	13.4**	5.9	78	0.000

Result of the independent sample t-test in Table 3 shows that there was a significant difference between the means of the post-test of the experimental group (M=79.90; SD=9.25) and the control group (M=66.45; SD=11.06); $t(78)=5.9$, $p<0.001$. On the average, the post-test scores of the experimental group is significantly higher by 13.45 points compared to the control group's scores. Furthermore, Cohen's effect size value ($d=1.32$) suggested a high practical significance which tells us that the difference between these two groups is large. Hence the result in the experimental group imply that the flipped instructional plan did increase the academic performance of the respondents.

Discussion and Conclusion

To develop the instructional plan using the flipped classroom approach based on First Principle of Instruction, the researcher had conducted extensive literature review on the method as well as the important activities needed in the teaching of Management Accounting. The suitable learning theory and method were chosen to implement the flipped classroom approach in the context of learning at the matriculation college. Additionally, at the assessment level, the quality of the instructional plan was evaluated before the learning process was implemented. The assessment of output and findings before the implementation process was based on the experts' evaluation in specific fields (Lynn, 1986). As stated by Sidek and Jamaludin (2005), the content validity, reliability and usability are very important to ensure that the module or the instructional plan developed can become a good guide for its users.

Generally, the study implemented managed to develop an instructional plan via the flipped classroom approach for four topics in Management Accounting for matriculation students. The content validity level for the instructional plan developed was high. The findings for the content validity by the experts showed a high value 93.33%. The comments and suggestions from the experts about the instructional plan were also good and encouraging. It is hoped that when it is used consistently, it could help in improving students' achievement in the accounting subject. This is because a learning environment which is developed from this approach has been accepted and confirmed as an instructional strategy (Harahap, 2019). This learning approach has been practised and believed by many practitioners in the education field all over the world. Many studies have been conducted to identify the effectiveness of this approach on the learning output as well as on the students (Kong & Song, 2015; Thai, Wever & Valcke, 2017; Lo, Lie & Hew, 2018).

To conclude, the instructional plan for the Management Accounting topic using the flipped classroom approach based on *First Principle of Instruction* (Merrill, 2002) is suitable to be utilised at the matriculation level. This instructional plan functions as a teaching guide for matriculation lecturers to teach the topic of Management accounting specifically and the accounting subject in general. Furthermore, it could provide a guidance for other educators to adapt the flipped classroom approach for other subjects. It is hoped that this study could assist in imparting useful information for the ministry related to the flipped classroom

approach which could be utilised by other educators in all educational institutions. Additionally, this approach could open possibilities for collaboration and opportunities for the students themselves to structure their knowledge with their peers.

This study adds to the body of knowledge in the field of education by providing evidence for promoting student achievement in Management Accounting using a flipped classroom instructional plan. This study, like most other studies, has limitations. The first limitation concerns whether student performance improved as a result of the flipped classroom design or as a result of the student's time on task. There is no reliable data to compare time on task in the lecture-based course versus the flipped classroom course. Future researchers can look into the long-term effects of the flipped classroom. For example, does the flipped classroom influence a student's decision to major in accounting? Researchers are encouraged to conduct additional research into the efficacy of the flipped classroom and its impact on accounting education.

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