The Effects of Changes in Teaching/Learning Schedule Pattern in Physiology Subject among 2nd M.B., B.S Students from University of Medicine, Magway

Zarchi Theint Theint Hlaing, Mya Pwint Phyu, Sanda Kyaw

ABSTRACT

The failure rates of the medical students had increased during the past few years. There are many supportive factors for deteriorating the students' performance. One of these might be due to some defect in teaching/learning system. Therefore, the aim of this study is to determine the effects of changes in teaching/learning schedule pattern in Physiology Subject among 2nd MB BS students from University of Medicine, Magway. A Comparative study was done. Data was collected from 2nd MBBS students studying at University of Medicine, Magway, Myanmar (n = 230). Class test-1 was done before the introducing of the new teaching/learning schedule pattern. There was 3-month intervention of introducing the new teaching/learning schedule pattern. At the end of this program, class test-2 was done. Scores of all students in class test-1 and class test-2 were compared and analyzed. In the present study, the average marks of class test-1 and class test-2 were 38.23±14.56 and 43.32±18.42, respectively. It was found that the average score of the students in class test-2 was higher than that of class test-1 (p< 0.001). Both class test-1 and class test-2 included 2 sections which involved multiple choice questions (MCQs) and multiple short questions (MSQs). In MCQs section, 22.17% of the total students were passed in class test-1 whereas it was increased to 33.48% in class test-2 (p< 0.01). In MSQs section, it was indicated that 29.56% of the total students were passed in class test-1 and 39.56% of the students were passed in class test-2 (p< 0.001). In the average score of both MCQs and MSQs, the students passed rate is increased from 26.96% to 36.96% after the changing of teaching/learning style (p< 0.001). This findings suggested that the new teaching/learning style was more effective than the traditional teaching.

Keywords: Multiple choice questions, Multiple short questions, Teaching/Learning style.

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I. INTRODUCTION

The effectiveness of lecture and discussion methods on students' performance has been shown by a number of studies. Some of the researchers pointed out that there are no differences in applying either discussion or lecture in the students' learning activity. Others stated that the discussion and lecture have some advantages and disadvantages on each other.

Byers & Hedrick [1] found that the lecture method is more effective for the student's performance than the discussion method whereas the discussion method is more preferable for retention and better reasoning. Mcrae & Young stated that lecture enhanced for immediate recall of the material content while discussion is more effective for retention [2]. The traditional lecture is also necessary because of which academics use to provide students with essential background knowledge [3]. There is evidence showing that lectures can be an effective method of

teaching when used properly and can help to organize and transmit content knowledge effectively [4]. In medical universities, we are going to outcome based integrated curriculum in which active learning method becomes an important point. To change teacher centered to student centered teaching technique, active learning is crucial. The purpose of using active learning is increasing student performance which is also motivating the students to learn, increasing classroom satisfaction and facilitating higher level thinking skills [5]. To get the better performance of the student, it might reduce the student and teacher ratio. Therefore, smaller classes are better than large group lecture. A tutorial is one method of smaller classes that can transfer more knowledge and familiar between the students and teacher [6].

During the past few years, the failure and dropout rate of the students had been increasing. It might be due to the student factors such as low critical thinking, little interesting in lessons and uncertain aim. It might also be

due to teaching/learning system. We have been using traditional teaching methods for a long time and so traditional lectures, practical demonstrations and tutorials are mostly used. Lecture is the main teaching method and it takes 50% of total teaching hours (25% is for tutorial and the remaining 25% is for practical). Duration of a lecture is about 3 hours with or without 10-15 minutes break. Students are boring due to one-way teaching method in a lecture. Tutorials are intended for active discussion on the previous lectures. However, most of the students do not know how to discuss in a tutorial section. They scared to ask a question or to discuss the unclear facts. So, the tutorial classes become second lecture and the students are not active. Teaching/learning style in conventional tutorial class is also passive. At the end of each chapter, there is chapter end test. However, the performances of the student are not improved. The failure rate of the students in class test is 71.3%. It is the highest failure rate in Physiology subjects during the past 10 academic years. Actually, to improve the student performance, we need to change our teaching/learning style.

According to current problem, this study is designated to introduce the new teaching/learning schedule pattern for improving the student performance.

II. MATERIAL AND METHODS

A Comparative study was done. Data was collected from 2nd MBBS students studying at University of Medicine-Magway, Myanmar. All the students gave consent to participate in this study (n = 230). Class test-1 was done before the introducing of the new teaching/learning schedule pattern. Scores of all students were collected. There was 3-month intervention of introducing the new teaching/learning schedule pattern. At the end of this program, class test-2 was done. Scores of all students were also collected. Data were analyzed by using SPSS software for window (version 23, SPSS Inc., Chicago, IL, USA). All data were expressed as Mean $\pm$ SD. Paired *t*-test was used to analyze the significant difference between the scores of the students before and after changing of teaching/learning schedule pattern. Chi-square test was used to determine the association between the score of the students and the new teaching/learning style. The differences were considered significant when $p < 0.05$.

III. RESULTS

Figure 1 showed the average class test marks of the students before and after changing teaching/learning schedule style. Figure 2 indicated the percentage of passed and failed students in multiple choice questions before and after changing teaching/learning schedule style. Figure 3 pointed out the percentage of passed and failed students in multiple short questions before and after changing teaching/learning schedule style. Figure 4 specified the percentage of passed and failed students in average score before and after changing teaching/learning schedule style. The percent change of MCQs and MSQs after three months intervention was shown by Fig. 5.

Fig. 1. The average class test marks of the students before and after changing teaching/learning style.

***indicates significant difference at $p < 0.001$.

NB: Comparison was done by Paired *t*-test.

Fig. 2. The percentage of passed and failed students in multiple choice questions before and after changing teaching/learning style.

NB: Comparison was done by Paired *t*-test.

Fig. 3. The percentage of passed and failed students in multiple short questions before and after changing teaching/learning style.

NB: Comparison was done by Paired *t*-test.

Fig. 4. The percentage of passed and failed students in average score before and after changing teaching/learning style.
NB: Comparison was done by Paired t-test.

Fig. 5. The percent change of MCQs and MSQs after three months intervention.
***indicates significant difference at $p < 0.001$.

IV. DISCUSSION

In this study, we introduced a new teaching/learning schedule pattern. The students were given short period of lecture followed by tutorial section including discussion. The duration of lecture was not exceeded one and half hours. The tutorial and lecture ratio were increased. Teaching hours of lectures was reduced to 35% of total hours. Another 30% is for tutorial and the remaining 35% is for practical. In post-lecture tutorial class, we used active teaching/learning style with discussion in spite of second lecture. We also used Jigsaw method for small group teaching in tutorial. The jigsaw method is a teaching strategy that helps students to develop skills for teamwork. It is an effective way to increase student engagement that facilitates peer-to-peer learning. It is also helpful in motivating students to accept responsibility for learning something well enough to teach to their peers. It also gives each student a chance to be a spotlight [7]. There was open-book tutorial in spite of chapter end tests at the end of each chapter. Open book tutorial by using text books might increase thinking process of the students.

Moreover, we analyzed the student's satisfaction on the changes of teaching/learning style by questionnaires. In the feedback, 82% of the students preferred the new

teaching/learning style whereas the remaining 18% preferred the old one. Forty six percent of the students have a preference to tutorial class with active teaching/learning style, 35% of the students more prefer to lecture and the remaining 19% of the students accepted to both. Ninety two percent of the students preferred open book tutorial to chapter end tests. Eighty five percent of the students agreed that the open book tutorials are effective for both MCQs and MSQs.

In the present study, the average marks of class test-1 and class test-2 were 38.23 ± 14.56 and 43.32 ± 18.42 , respectively. It was found that the average score of the students in class test-2 was higher than that of class test-1 ($p < 0.001$, $t = 4.14$). Both class test-1 and class test-2 included 2 sections which involved multiple choice questions (MCQs) and multiple short questions (MSQs). In MCQs section, 22.17% of the total students were passed in class test-1 whereas it was increased to 33.48% in class test-2 ($p < 0.01$, $t = 3.03$). In MSQs section, it was indicated that 29.56% of the total students were passed in class test-1 and 39.56% of the students were passed in class test-2 ($p < 0.001$, $t = 3.94$). The average MCQs score was 19.75 ± 7.55 and 21.99 ± 10.35 in class test 1 and 2 respectively ($p < 0.01$). There is also significant change in average score of MSQs between the class test 1 (18.84 ± 8.92) and class test 2 (22.12 ± 9.61) ($p < 0.001$). In the average score of both MCQs and MSQs, the students passed rate is increased from 26.96% to 36.96% after the changing of teaching/learning style ($p < 0.001$). It was agreed with the studies of Al-Faleh (1992) and Abraham and Madhavikutty (2016) [8], [9].

Al-Faleh conducted a study that the effects of teaching which include both lecture and discussion methods in 10th grade students [8]. It was found that the students gained more knowledge after applying both the lecture and discussion methods than traditional lecture methods. The students obtained higher scores when taught by the lecture followed by discussion method. The students' average scores were higher on the post-tests (63.20 ± 24.01) than on the pre-tests (17.10 ± 15.85) ($p < 0.01$; $t = 19.7$) [8].

Abraham and Madhavikutty (2016) had done a comparative study on the effectiveness of interactive lecture and tutorial among undergraduate medical students. This study was done among first year MBBS students ($n = 130$) studying at Govt. Medical college Kottayam. It was found that there was statistically significant difference between the means of Pretest and Posttest marks ($p = 0.001$) of both interactive lectures and Tutorials. Knowledge gained by interactive lectures was significantly higher ($p = 0.001$) than by tutorials. In the feedback received 76% students preferred and accepted tutorials whereas only 14.7% preferred and accepted interactive lecture as a better teaching methodology [9].

The lecture method can be used to introduce a new subject and it allowed many students to receive information quickly [10]. There were also some disadvantages like: the teacher was not able to know if the students understood the lecture or not, the students were not permitted to ask questions or share opinions, and it rarely achieved a higher level of effective learning [11]. Discussion method involves thinking, it leads to better learning and retention and any

student can participate. However, this method is more time consuming than the lecture, and it is more adaptable to a small group of 25 students or less [10]. Byers and Hedrick [1] and Handleman [12] pointed out that the lecture method is more effective than discussion method. The lecture method tends to be more effective in teaching factual knowledge, and the discussion method tends to be more effective in teaching intellectual abilities and skills [13].

In the present study, the percent change of MCQs was 51% after three months intervention while that of MSQs was only 25% ($p < 0.001$). Better score in MCQs indicates improvement of critical thinking. Moreover 1 out of 230 student got distinction mark in class test 1 although 8 out of 230 students got distinction mark in class test 2 (Odd ratio=8.25; 95% CI = 1.02 to 66.52). It can be concluded that students got more critical thinking and improvement of knowledge with comprehension.

As indicated from the previous literature, most of the studies revealed that each method has some advantages and disadvantages. It can be concluded that no method is better than the other with respect to students' performance. Therefore, we tried to improve the student's achievement by using both methods.

V. CONCLUSION

Based on findings of the present study, active teaching/learning style with Jigsaw method improved the presentation skill and team performance of the students. Open book tutorial also increased the knowledge and critical thinking of the students. Therefore, it can be concluded that the new teaching/learning style come to be more students' achievements.

REFERENCES

- [1] Byers, W. S. & Hedrick, R. E. (1976). A Comparison of Two Teaching Strategies; Lecture vs. Discussion in a Small Class Environment at Florida Southern College. (ERIC Document No. ED136741).
- [2] Mcrae, L. S. & Young, J. D. (1988). Student Satisfaction in Introductory Business Courses Taught by Lecture and Discussion Methods. *Journal of Education*. Vol.6, pp. 252- 255.
- [3] Khee, C.M., Wei, G.W. and Jamaluddin, S.A. (2014) Students' perception towards lecture capture based on the technology acceptance.
- [4] Wike, R.R. (2003) The effect of active learning on student characteristics in a human Physiology course for non-majors. *Adv Physiol Educ*. Vol. 27, pp 207-223.
- [5] Costa ML, Van Rensburg L, Rushton N. Does teaching style matter. A randomized trial of group discussion versus lectures in Orthopaedic undergraduate teaching. *MedEduc*. 2007; 41:214-7.
- [6] Iputo, J.E. (2005) Facilitating the integrated small group tutorial in a medical programme-the university of Transkei experience. *South African Medical Journal*. Vol. 95, pp 959-62.
- [7] Tewksbury, B. J. (1995). Specific strategies for using the "jigsaw" technique for working in groups in non-lecture-based courses. *Journal of Geological Education*, 43, 322-326.
- [8] Al-Faleh, S. K. (1992). "Lecture Vs. Discussion in Teaching Biology for Tenth Grade Students in Saudi Arabia" *Theses, Dissertations, & Student Scholarship: Agricultural Leadership, Education & Communication Department*. 84.
- [9] Abraham, G. and Madhavikutty, G. (2016) A comparative study on the effectiveness of interactive lecture and tutorial among undergraduate medical students. *International Journal of Contemporary Medical Research* Vol.3 (11), pp 2454-7379.
- [10] Randall, J. S. (1978). You and Effective Training Part 5: Methods of Teaching. *Training and Development Journal*. 32. (10). pp. 8-11.

- [11] Jones. A. S. & Bog Ford. L. W. & Wallen. E. A. (1979). Strategies For Teaching.
- [12] Handleman. C. (1976). The Lecture Versus The Group of Discussion Method of Teaching The Community College. *Commun.*
- [13] Tomm, K. & Leahey, M. (1980). A Comparison of Three Teaching Methods. *Journal of Marital and Family-Therapy*. Q., (4), pp,453-458.

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