Full Length Research Paper

Can Pathology –Teaching' Strategy be Affected by the Students' Learning Style and to what extent the Students' Performance be Affected?

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The best way to establish any curriculum is to identify about the learner, how would they learn? And what is the easiest method of perception of knowledge to our students? To answer these questions, one must identify the learning style of our beneficiaries. In our pathology, integrated–based curriculum, no attention was made for our students' learning style. This has a drawback for some students who cannot achieve the learning objectives of the curriculum. The main goals of this study were to make periodic evaluation of our pathology curriculum. To achieve that, we find the first step is to know, how the students deal with the pathology lectures? The extent of pathology perception by students. So, the identification of learning style of the student is the first step in a long chain of challenges and changes that must be occurring in the pathology curriculum. This study was carried out in two consecutive years on two successive undergraduates by Faculty of Medicine, Albaha University (FMBU), Where two classes were selected for this study. Each class includes 60 students. All students of the two classes were asked to identify their own individual learning styles through answering a planned short questionnaire instrument prepared by the Medical Education Unit, faculty of medicine, Albaha University (MEUFMBU). This instrument divides the students into figures-attached, audio-visual and observable or perceptible learner. According to the results obtained, modification of our lectures will be made. For this purpose, eight modules were selected for both the study and control group, i.e, four for each. The changes in the lecture were made in the modules of the study group. Regarding our students' learning style, we found most of them having figures- attached style, little have audio-visual style and a few have observable style. Accordingly, we modified our pathology lectures to be more interactive than the silent traditional one, By shifting towards the most interactive learning, we found a marvelous in student performance and achieving the learning outcomes among the study group than in the control group. Identification of student' learning style is extremely important for curricular development and its periodic evaluation. Not all ways of interactive lecture are suitable for the students, but those elaborated from student 'learning style are the most active that make our lecture more attractive, and more impressive.

Keywords: learning style, interactive lecture, student' performance

INTRODUCTION

In 2011, development of our pathology' curriculum of Faculty of Medicine, Albaha university (FMBU) had been done. Two questions have been evoked, Does our pathology' curriculum to give attention towards students' learning style? Is the learning style compatible with the teaching style and strategies? These questions have to be answered and many explanations are needed. The importance of identification of learning style comes from, how to deliver the knowledge in a simple and clear-cut approach that is matched with the student' understanding. As we noticed some students prefer atlas and illustrated textbook, other prefer watching videos, and others prefer the written formula, we have been motivated to identify our students' learning style. We reviewed many learning style instruments to keep one suitable for our students, but we found most of them are so complicated and not free for research.

A learning style is the process of educating conscientious to an individual that is supposed to allocate that individual to learn best. The idea of learning styles is a somewhat unsupported presumption of the observation that most people have a particular types of interactions when it comes to learning (Stahl, 2002).

Campbell (Campbell, 1991) reviewed 32 instruments for measuring learning style preferences. Some of these instruments are free and some are not. Some can be self-administered, but trained personnel must administer others. Coffield et al, (Coffield et al., 2004) have extensively reviewed the learning styles literature, evaluated the major learning style models and discussed the implications for practice. They identified 71 learning models and instruments and categorized 13 of these as major models. Despite this large number of instruments there are many criticisms towards these instruments (Hawk and Shah, 2007).

The main goals and objectives of this study were to make periodic evaluation of our pathology curriculum. To achieve that, we find the first step is to know, how the students deal with the pathology lectures? The extent of pathology perception by students. So, the identification of learning style of the student is the first step in a long chain of challenges and changes that must be occurring in the pathology curriculum. The students' learning style acts as a nucleus for adjustment of pathology teaching. According to the results obtained, modification of some teaching tools and strategies will be done in serious starting by the judgment of lecture to match with students' learning style.

MATERIAL AND METHODS

This study was carried out in two consecutive years on two successive undergraduates by faculty of medicine, Albaha University (FMBU). Where two classes were selected for this study, the 1st class incriminated in the study was second semester of grade II (level V) during the year 2014, and ended with the first semester of grade VI (level 7) in the year of 2016. The 2nd class started with the 2nd semester of 2015 and ended with 1st semester of grade VI by the year of 2017. Each class includes 60 students. All students of the two classes were asked to identify their own individual learning styles through answering the short questionnaire instruments prepared by the medical education unit, faculty of medicine, Albaha University. The questionnaire is simple and its results will divide the students into figures attached, audiovisual attached, and observable or perceptible learner. The figures-attached is the student who learns more by seeing figures and graphs. The audio-visual attached is the person who learns more by attaching video, tubes, scientific conferences, the observable or perceptible learner who does more practice, prefer writing a notice, summarize, etc…. Analysis of data from the questionnaire was done and according to the results obtained, one of the teaching tools, lecture, will be modified.

As our curriculum is integrated-based which include vertical and horizontal type of integration, for each class, eight vertical modules were selected for both the study and control group i.e. four for each.

The modules selected for the study group were; a respiratory system module for level IV, musculoskeletal system module for level V, nervous system and special sense for level VI, and basic radiology module for level VII. The modules selected for the control group were; cardiovascular system module for level IV, gastrointestinal system module for level V, reproductive system for level VI, and laboratory medicine module for level VII.

These selected modules were vertical modules in which the students end the module and start new one, to put in mind the same students of both the study and control modules are implemented in the study.

Modification of pathology lectures was done on the selected modules for the study group of the two classes. The modification was in the form of incrimination of more illustrated figures, histopathological photomicrograph, radiographs, as well as videos that highlight more about the procedures and pathogenesis of the diseases that become more dynamic with addition with audio aids. For the control group, the lectures were more traditional containing less figures and more written words.

According to the blueprint of modules, the weight of pathology questions was estimated and so number of pathology questions in each module either study or control modules were accurately calculated. The pathology questions and answers for all the study modules were collected as one block and a total mark for each student was given according to his right answers.
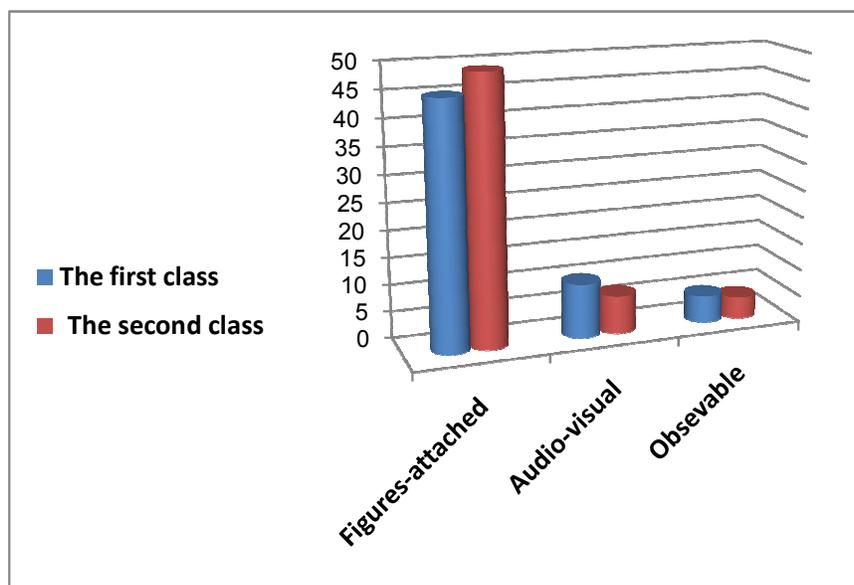
Graph 1. Graph showing the distribution of students relative to their learning styles.

Table 1. No. of Pathology Questions distributed in the study module group

Module	Level	No. of pathology Q.
Respiratory	4	16
Musculoskeletal	5	20
Nervous system and special sense	6	18
Basic imaging module	7	6
Total		60

Table 2. Distribution of students according to their degrees in the study group

	55-60	50-54	45-49	40-44	35-39	30-34	25-29	< 24	Total
No. of students of the 1st class	5 (8.3%)	12 (20%)	14 (23.3%)	16 (26.7%)	4 (6.7%)	3 (5%)	3 (5%)	3 (5%)	60
No. of students of the 2nd class	8 (13.3%)	9 (15%)	13 (21.7)	16 (26.7%)	5 (8.3%)	4 (6.7%)	3 (5%)	2 (3.3%)	60
Total	13	21	27	32	9	7	6	5	120

The same was done for control modules. Accordingly, we stand on the pathology grade for each student in the both groups. The modules selected for both groups have the same number of pathology questions, the same study level in parallel, and the students are the same. All modules are arranged vertically, so the same students will be transferred to the upcoming one. The pathology lectures in the both groups are prepared by all pathology staff members, so all members have the same mode of the delivery of knowledge to the students as well as the same teaching style to a large extent. All the pathology' questions applied for both groups have the same level of depth of knowledge.
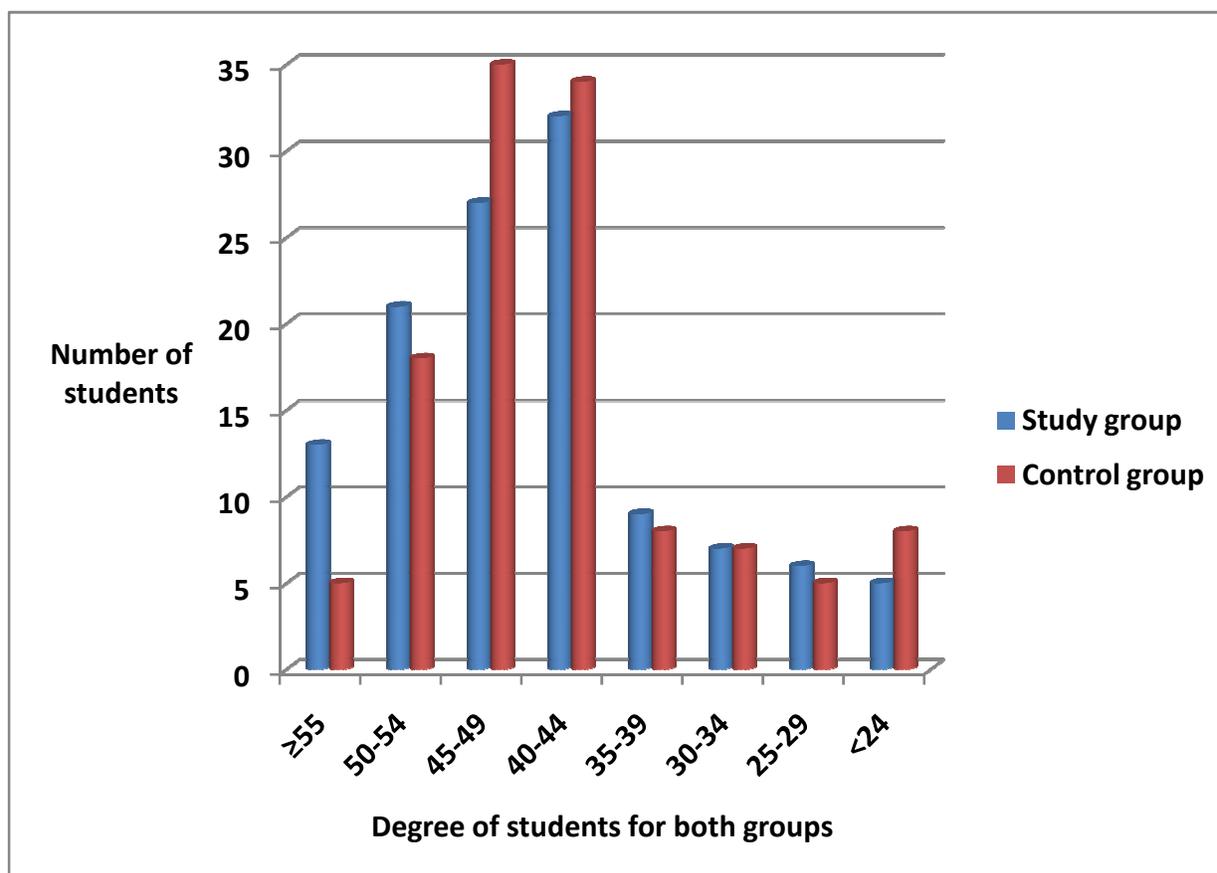
RESULTS

This study was carried out on two classes, each class contain 60 students, each student received the organized learning style questionnaire and the following results were obtained: for the 1st class; 45 students (75%) were figures-attached learner, 10 students (16.6%) were audio-visual and 5 students (8.3%) were observable or perceptible learner. For the 2nd class; 49 students (81.6%) were visual learner, 7 students (11.7%) were audio-visual and 4 students (6.7%) were observable or perceptible learner (Graph 1).

Table 3. No. of Pathology Questions distributed in the control module group

Module	Level	No. of pathology Q.
Cardiovascular	4	12
Gastrointestinal	5	16
Reproductive	6	14
Laboratory medicine	7	18
Total		60

Table 4. Distribution of students according to their degrees in the control group

	55-60	50-54	45-49	40-44	35-39	30-34	25-29	< 24	Total
No. of students of the 1st class	3 (5%)	10 (16.7%)	17 (28.3%)	15 (25%)	5 (8.3%)	3 (5%)	2 (3.3%)	5 (8.3%)	60
No. of students of the 2nd class	2 (3.3%)	8 (13.3%)	18 (30%)	19 (31.7%)	3 (5%)	4 (6.7%)	3 (5%)	3 (5%)	60
Total	5	18	35	34	8	7	5	8	

Graph 2. Graph reflects the comparison between the degree of the students of both classes between the study and control group.

According to these results, modification of lectures was done in the study module group only, no changes occur in the modules of the control group.

I: The modules, study group
II: The modules, control group

DISCUSSION

The best way to establish any curriculum is to identify about the learner, how would they learn? And what is the easiest method of perception of knowledge to our students? To answer these questions, one must identify the learning style of our beneficiaries. In our pathology, integrated –based curriculum, no attention was made for our students learning style, this has a drawback for some students who cannot achieve the learning objectives of the curriculum. As our curriculum must be periodically re-evaluated, one of our strategy is to identify the learning style of our student to stand on the pro and cons of teaching tools that our staff used. So, the planned questionnaire instrument was elicited. This instrument divides the students into figures attached, audio-visual and observable or perceptible learner.

Regarding our students' learning style, we found most of them having figures- attached style, little have audio-visual style and a few have observable style (Graph 1). Consequently, we modified our pathology lectures to be more interactive than the silent traditional one. Accordingly, we utilized a one of the advantages of learning style which is making a paradigm shift towards more attractive interactive teaching method. By shifting towards more interactive learning, we found a marvelous response in the student performance and achieving the learning outcomes as seen in tables and figures which demonstrate the degree of students in both the study and control group (Table1-4), (Graph 2).

What are the changes that have been done in our pathology lectures to be more attractive to our students? Many of the changes were done to match with the students' style. First, all PowerPoint slides contain illustrative impressive figures or graph form and less written words. Second; participation of the students, i.e. all students were asked to give comments on what they see. Third: some videos and clip that simplify the learning objectives and match with audio-visual students were introduced. Fourth: asking the students to draw some figures that translate their understanding the objectives, this match with the students who are of observable style. Fifth, Some students was asked to give periodic summaries every 10 minutes. Sixth; Short Multiple Choice Questions at the end of lecture was introduced to provide feedback about student understanding. All these changes make our lectures more interactive and the lecture is being transformed into student-centered lecture instead of a tutor or instructor-based. Several changes on traditional lecture are recommended by other authors (Kimmel, 1992; Kumar, 2003; Hardy and Key, 2007), but according to our students' learning style, we selected what is the suitable for them.

It is documented that amplified student participation shows the way to change in attitude and learning outcomes (Nasmith and Steinert, 2001; Berg et al., 2003). This is compatible with what we noticed in the enhancement of student performance in the study group than in the control group, Butler (Butler, 1992) has shown that students who are actively involved in the learning activity will learn more than students who are passive recipients of knowledge. Pajares (Pajares, 1996) found that Interactive lectures draw attention to common fallacies apprehended by the students and give confidence to students to question and thus increases self efficacy of student which is linked to their academic achievements.

We noticed that the attendance of students has improved. This is matched with positive data obtained by Maloney, and Lally (Maloney and Lally, 1998). The interactive lectures has many benefits as it diminish the repetitiveness of the passive learning (Modell,1996), allow for discussion (Rao and DiCarlo, 2000), augment the students' level of understanding and their apitude to create and integrate material (Rao and DiCarlo, 2001), and amplify the educational value of the lecture time (Goldberg et al., 2006).

CONCLUSION

Identification of student' learning style is extremely important for curricular development and its periodic evaluation. Not all ways of interactive lecture are suitable for the students, but those elaborated from student 'learning style are the most active that make our lecture more attractive, and more impressive. This will aid to a large extent to achieve our learning goals and objectives and improvement the student' performance. If we cannot use learning style. We can use use of multi-modal teaching strategies created a learning environment in which a student's learning style did not affect the student's course grade.

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