

Comparison of Visual, auditory and kinesthetic style to the academic achievement of Medical Education Student

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Abstract. Learning is phase of the attitude change as the result of experience and environment interaction that involves cognitive process. This study aims to compare visual, auditory and kinesthetic style toward academic achievement of medical education student. The present study was an observational analytic with cross sectional design. Samples were 184 respondents of Medical Education Program with stratified sampling technique. Data analysis using Chi Square Statistical Test and Two-Sample Kolmogorof-Smirnov test. Significant level at 0,05. There was significant difference of visual and auditory style toward academic achievement ($p = 0,018$ and $r = 0,114$). There was significant difference of visual and kinesthetic style toward academic achievement ($p = 0,005$ and $r = 0,111$). There was no significant difference of auditory and kinesthetic style toward academic achievement ($p = 0,955$ and $r = 0,009$). It be concluded that visual better than auditory and kinesthetic style toward improvement of academic achievement.

Keywords: Academic Achievement, Auditory, kinesthetic, Visual learning style, Medical Education student

1 Introduction

Nowadays, people live in a new era. Development of science and technology make the change of learning process and style. Every learner is unique and has nature potency. The ability of lecturer or education professional practice to recognize, acknowledge and respect the learning style aspects of learner' innate tendencies is needed. Learning style is the way in which each learner begins to understand and retain new knowledge.[1]Deporter and Hernacki devided learning style into three modes; visual, auditory and kinesthetic mode.[2] For visual mode, the learners are prefer to accept learning through interpreting charts, graph figures, and pictures. Auditory mode, students tend to get information by discussion and listening. While kinesthetic mode learners receipted information based on behavior such as touch, feel, see, and listen.[3] Learning styles and form of teaching have no effect on academic achievement prepared by pedagogical method of teaching.[4][5] However, medical education using adult learning system is different from pedagogical system. Curriculum of medical education in Faculty of Medicine Halu Oleo University refers to the concept of a curriculum map and Harden's SPICES model of educational strategy. Harden's SPICES model consisted of *Student-centered, Problem-based, Integrated teaching, Community Oriented, Elective Study*

periods and Systematic approach.[6] This curriculum will enhance the development of knowledge, skills, and positive attitudes of the learners. Lecture, problem based learning, clinical tutorial, seminars and clinical skills are sequential process of medical learning curriculum to prepare the next generation educators and better trained doctors who provide an even higher level of patient care and improved patient outcomes.[7]. This study objective is to compare visual, auditory and kinesthetic style toward academic achievement of Medical Education Student.

2 Material and Method

The present study was an observational analytic with cross sectional design. Samples were 184 respondents of Medical Education Program acquired by total sampling technique. Instrument of the research was Deporter and Hernacki questionnaire used to determine learning style of the students and academic achievement of learner released by Medical Faculty, Halu Oleo University. Data analysis using Chi Square Statistical Test and Kolmogorof Smirnov with significant level at 0.05

3 Result and Discussion

The research conducted on Faculty of medicine Halu Oleo University located in Kendari, South East Sulawesi. This faculty set up as part of the faculties based on Rector decree number 413/SK/UN29/PP/2011 dated September 30, 2011. Respondents were the students at the year 2011, 2012 and 2013 with characteristic of the respondent showed in Table 1.

Table 1. Characteristic of respondent based on gender, age, learning style and academic achievement

Characteristic of Respondent	Count (n)	Percent (%)
Gender		
Male	39	21.2
Female	145	78.8
Age (years)		
16-18	15	8.2
19-21	163	88.5
22	6	3.3
Learning Style		
Visual	65	35.3
Auditory	64	34.8
Kinesthetic	55	29.9
Academic achievement		
Poor satisfied	21	11.4
Satisfied	50	27.2
Very satisfied	97	52.7
Cum laude	16	8.7

Table 2. Comparison of Visual, auditory and kinesthetic style toward academic achievement of medical education students

Learning Style	Academic achievement								Total	p value
	Poor satisfied		Satisfied		Very satisfied		Cum laude			
	n	%	n	%	n	%	n	%		
Visual	2	1,087	13	7,065	40	21,739	10	5,435	65	p*=0.018; p**=0.005; p***=0.955
Auditory	11	5,978	18	9,783	30	16,304	5	2,717	64	
Kinesthetic	8	4,348	19	10,326	27	14,674	1	0,543	55	

p* Chi Square statistical test, $r = 0.114$, Comparison of Visual and Auditory learning style
p** Kolmogorov Smirnov statistical test, $r = 0.111$, Comparison of Visual and kinesthetic learning style
p*** Kolmogorov Smirnov statistical test, $r = 0.009$, Comparison of auditory and kinesthetic learning style

Table 1 shows the distribution of respondents based on gender, age, learning style and academic achievement. Majority of respondents (78.8 %) were female students and the others consisted of the male students (21.2%). Learning style of the students distributed equally on visual (35.3%), auditory (34.8%) and kinesthetic (29.9%). Majority of academic achievement of students were very satisfied (52.7%).

Table 2 showed the difference of visual and auditory learning style toward academic achievement and significant level at 0.018 (< 0.05) with symmetric directional measures at 0.114 (< 0.2), very weak positive correlation). The result indicated that the increase of visual compared to auditory learning style implicated to the improvement of academic achievement of students. Moreover, the difference of visual and kinesthetic learning style toward academic achievement and significant level at 0.005 (< 0.05) with symmetric directional measures at 0.111. The result indicated that the increase of visual compared to kinesthetic learning style implicated to the improvement of academic achievement of students. Likewise, there was no difference of auditory and kinesthetic learning style toward academic achievement and significant level at 0.955 (< 0.05) with symmetric directional measures at 0.009.

Student-centered learning as adult learning mode of curriculum is one of the curriculum applied in Indonesia especially undergraduate medical education program. This curriculum emphasizes at improving the quality of student knowledge, skill, and attitude in implementing standard of medical education. Likewise, pedagogical curriculum emphasizes to educator and what they teach. [6] Learning style concept has been known since at the mid-1970s. [8] Furthermore, this concepts have been investigated to describe how the students think and learn and classifying students into different group based on the innate potency they have. [8][9] Learning styles also depend on learning situation and environment, [10] but consideration of learning styles to design a matching teaching strategies or learning environment does not transfer into the problem solutions.[11] Matching teaching strategies with learning style preferences of the students is still debatable research issue. Learning styles and preference for different teaching methodologies did not correlate. [10]. The efforts to correlate learning styles toward academic achievement needed to apply based on field of science, [12][13]because of each learning style has its own strengths and weaknesses.[14]Even though, learning styles have no effect on academic achievement, [4] this could be useful for the lecturer to evaluate the learning differences in order to improve the academic achievement.[13][15]. The aim of this research was to compare three groups of

students with characteristic of learning style as described at Table 1. Evaluation of learning style of the student as the guide how to teach of the teacher. The teachers should create supporting environment at school, and use proper teaching methods.[9] Although visual and auditory learning styles is dominated by women but there is no relationship between the variables of learning styles, genders and interaction of learning styles with genders to academic achievement. [16]

Visual learning style to be the better choice in order to improve academic achievement of the students. This means that the increase of visual compared to kinesthetic learning style implicated to the improvement of academic achievement of students. This condition directed to interaction effects on achievement occurred from visual/verbal learning style and concentration in the use mobile learning, [17] and school climate on students achievement of learning entrepreneurship,[18] but there is no difference in English achievement among visual, auditory, and kinesthetic students. [2] Medical education develops from a substantive system reliant on memorization to procedural on problem based learning. Undergraduate medical education was further shaped into the modern form with the first phase containing preclinical education, and the second phase clinical rotations in the major specialties. [19]There are diverse learning styles method at undergraduate and postgraduate level of medical education. [15]. Methods used by students to focus in text and process new information that they use to solve is based on the character of their thinking, intelligence, and personality characteristics.[20] Analysing learning styles can be beneficial to students and might help them focus on learning, thus increasing educational outcomes and satisfaction.[21]

In academic phase of medical education, learning process conducted by face to face lecture hold on proficient doctor. Students in medical education program get information by graph, visual image and pictures in the field of basic science and clinical science. However, most of lecture in the class room presented by graph, and the other method to build understanding of the student. This is directed to visual learning style that the students have. The other hand, discussion group in tutorial and clinical skill or practice to mediate motoric or skill of the students directed to auditory and kinesthetic learning style. Although, posture of learning objective of the field of study reach out successfully, but distribution of theory, group discussion and practice is not equally.

4 Conclusion

Furthermore, the result of this study that there was significant difference of visual and kinesthetic style toward academic achievement. There was no significant difference of auditory and kinesthetic style toward academic achievement ($p = 0,955$ and $r = 0,009$). It be concluded that visual better than auditory and kinesthetic style toward improvement of academic achievement. So the future, curriculum should planned to accommodate the student learning style in order to improve academic achievement of medical education student

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