

Teaching Style among Science Teachers in Secondary Schools

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Abstract: Teachers in the 21st century need to improve the quality of teaching and learning. The quality of teachers' teaching style is one of the influential factors in producing a more effective learning environment. This study aims to identify the teaching style among science teachers in secondary schools. This quantitative study involved 320 high school students in Johor, Malaysia. The instrument used to obtain the data was a questionnaire consisting of 45 items, including demographic and Grasha Teaching style. Survey results were analyzed using the Statistical Package for The Social Science (SPSS) version 20.0 software for descriptive and inferential statistical analysis. This research found that expert style, formal authority style, personal models style, facilitators style, and delegator style used by science teachers. However, the facilitator style is the most often used teaching style by science teachers in the teaching and learning process. Besides, the findings of this study show that there is a positive and significant relationship between facilitator style and student academic achievement. This research suggests that teachers should focus on the teaching style used in the classroom to improve student academic achievement.

Keywords: Grasha teaching style, teaching, learning, academic achievement, education.

I. INTRODUCTION

Education is key to the growth and development of a nation. The educational process not only provides teaching and learning disciplines but also provides knowledge, skills, and competencies. Quality human resources is a valuable asset of a country, especially to solve many existing problems and advance the quality of society in general (Abdullah et al., 2020). The teaching and learning process needs to be improved to ensure the competitiveness of the students in line with the nation's education philosophy. The Ministry of Education Malaysia (2015) has launched its 21st-century learning initiative in pioneering, that reflected in the development of the Malaysian Education Development Plan (2013-2025). The 21st-century learning is learning that focuses on students. The main focus is to produce students with information and communication skills, have the creative and critical thinking, and interpersonal and self-directed skills.

There are several characteristics of teachers for 21st-century learning, including mastering curriculum content, having pedagogical skills, understanding student development and loving them, understanding learning psychology, having counseling skills, and being able to use the latest technology during teaching and learning sessions (Ghani et al., 2015).

Teachers conduct effective, and meaningful teaching to enable students to actively respond to a learning goal (Chong & Cheah, 2009, Sumarwati et al., 2020). Teachers work primarily in education to enhance students' academic achievement and skills through teaching and learning activities. This can be summarized that competence teachers can help students to understand the content of learning with ease and make the main objectives of teaching achievement.

Teachers in the 21st century need to improve the quality of teaching and learning to diversify teaching methods that can assist in classroom activities (Alismail & McGuire, 2015; Amiruddin et al., 2020). The quality of teaching and learning includes the use of teaching styles that are relevant to student development, which helps students to understand the content of the lesson, the program is taught and actively interacting with other teachers and fellow students, individually or in groups (Bude Su et al., 2005). Learning is a change in a student's behavior is a result of the learning experience and not caused by development processes that occur naturally. Learning is a process that has several levels obtained systematically, starting from the reception of sensory stimuli organ, followed by the formation of concepts in the mind and ends with behavioral change (Mok, 2000). Thus, the learning process is considered successful when students understand the aims to be achieved and appreciate the experience acquired during the learning process.

The expert style is practiced by highly educated and expert teachers in the field of study (Shaari et al., 2014). Teachers who practice it always encourage their students to achieve excellence and teach in detail and depth. Additionally, these teachers always want their students to be prepared and care about the maximum distribution of information. The facilitator style emphasizes teacher interaction with students. They will provide guidance and instruction by asking questions, options to explore, giving alternative suggestions, and building selection criteria. This is intended to apply the ability of students to be independent, initiative, and responsible. These teachers prefer to teach by using project methods by giving feedback and support. Personal style, teachers give personal examples during the teaching process to be an example to their students. Teachers will be a prototype to students in their thinking and behavior and they tend to drive and direct observers and then imitate the methods that have been shown (Grasha, 1994).

The formal authority style of teachers always gives positive and negative feedback to their students. They assume that the teaching process needs to be done in standard, accurate and acceptable form by the students which covers the overall teaching goals set by the school (Ford, Robinson & Wise, 2016). Teachers with this teaching style are more interested in structured (framed) teaching methods. For the delegate style, teachers have the attention to shape the ability of students to learn independently to increase students' confidence. Students are encouraged to perform their duties independently, and teachers only act as the primary source of reference. However, the delegate style has its disadvantages if a teacher is less sensitive to the ability and willingness of students to complete existing tasks.

The quality of teacher teaching style has an important role in producing a more effective and meaningful learning environment (Nordin & Ling, 2011). The process of teaching and learning is the process where students should be able to receive teaching materials through a variety of teaching methods applied by teachers who can respond to the subject being studied. Teaching the subject of science is often considered a difficult and boring thing by a teacher, this is because teachers cannot relate the concepts contained in the subject (Shirazi, 2017). This problem also arises because the traditional learning environment, students are not trained to discover something new, skills to answer questions that are weak, teacher-centered teaching so that students are not creative and teaching and learning activities that do not interest students (Sulaiman & Muhammad, 2010).

Thus, this study was conducted to identify the teacher teaching style and student academic achievement for science subjects in secondary schools. This study is based on Grasha Teaching Styles includes the expert style, formal authority style, personal models style, facilitators style, and delegator style. The following objectives have been developed:

- i. To investigate the most often used teaching style by science teachers in the teaching and learning process.
- ii. To identify the relationship between the most often used teaching style by teacher and student academic achievement for science subjects in secondary school.

II. METHODOLOGY

In this study, researchers used quantitative survey studies. The population in this study consisted of all secondary school students in Johor, Malaysia who took science subjects. Samples were selected using random sampling. The instrument used to obtain the data was a questionnaire consisting of 45 items, including demographic (five) and Grasha Teaching style (45) on a seven-point Likert scale. The instrument adapts from Grasha's Teaching Style Inventory (1996). Before conducting the actual study, researchers conducted a pilot study of 55 respondents. Based on the pilot study, the reliability of the survey questionnaire was greater than 0.7. Because the overall Cronbach's alpha value is 0.870,

then no items are dropped. Therefore, the instruments of this study are reliable and valid for obtaining stable test results from the respondents. A total of 320 questionnaires were distributed, to 283 respondents. In this study, SPSS version 20.0 was used to analyze the data, descriptive, and inferential. The researchers used the data from the survey study to identify the teaching styles most often used by teachers in Johor, Malaysia.

III. FINDINGS

This study involved 197 excellent students and 123 non-excellent students in a secondary school in Johor. Survey results were analyzed using mean, standard deviation, and Pearson Correlation using the Statistical Package for Social Science (SPSS) version 20.0 software.

A. *The most often used teaching style by science teachers in the teaching and learning process*

Teachers in the 21st century need to improve the quality of teaching and learning to diversify teaching methods that can assist in classroom activities (Alismail & McGuire, 2015). Based on the findings in Table 1, so that the fifth teaching style used by secondary school science teachers in the expert style, formal authority style, personal style models, facilitators style, and delegator style. However, the facilitator style is the most often used teaching style by teachers in conducting teaching and learning of science subjects in secondary school, namely with mean = 3.81 and SD = 0.866. The findings of this study are in line with the study conducted by Heydarnejad, Fatemi, and Ghonsooly (2017) who found that facilitator style has the highest mean score of Iranian English as foreign language Teachers. Besides, according to Halim et al. (2006), the science teacher needs the help of many aspects of it being creative in teaching science. The attitude of the students who did not want to ask to make the process of teaching and teaching unattractive and bland (Ismaon, Iksan & Othman, 2013). In this regard, the similarity that facilitators style has the highest meanings compared to other teaching styles, possibly because science and English subjects are lessons that require students to actively explore, ask teachers and friends, express ideas or opinions, be responsible, and self-reliant in teaching and learning activities.

Table I. Science Teachers Teaching Style In Secondary School

Teaching Style	Mean	SD
Expert	3.55	0.751
Facilitator	3.81	0.866
Personal Model	3.69	0.743
Formal Authority	3.37	0.614
Delegator	3.19	0.489

B. *The relationship between the most often used teaching style by teacher and student academic achievement for science subjects in secondary school*

Teaching is a process conducted for imparting knowledge, concepts, and skills (Meng, 2003). Baharuddin et al. (2001) state that teaching is a process by using specific methods to help students to improve academic achievement. The research findings in Table 2 show that based on the analysis using the Pearson Correlation test, indicates that there is a significant relationship between the most often used teaching style by teachers, namely facilitator style and student academic achievement ($r=0.812$, $\alpha=0.000$). The value of r obtained is high and the strength of the correlation is very high, the null hypothesis is rejected. Therefore, this study achieved a very high correlation between facilitator style and student academic achievement. Because which shows that the correlation coefficient is positive it can be concluded that the facilitator style often used as a method of teaching science will increase the academic achievement of students and vice versa.

The results of this study have similarities with the findings Ab. Rahim and Othman (2017), namely that there is a significant positive relationship between academic achievement and the lecturer teaching style. However, both of these studies also have differences, namely that the study found that the facilitator's style is the style of teaching style most often used by teachers in conducting teaching and learning of science subjects in secondary school. While the study of Ab. Rahim and Othman (2017) found that expert style is the most often used teaching style by a lecturer of basic courses in entrepreneurship and innovation in university. These differences may be caused due to differences in levels of education. This is because, in reality, the way of teaching in secondary school teaching in different ways university, where students in secondary school are guided to explore, express opinions, and be trained to be independent. While at the university, most students already can express opinions and be independent, therefore the role of faculty as an expert in the field of teaching allows students to refer to the lecturer when there are things to explain in detail and depth. Therefore, teaching is defined as the delivery of information, knowledge, skills, or specific concepts for improving the quality of the students themselves during the following activities in the classroom.

Table II: The Relationship Between Facilitator Teaching Style And Student Academic Achievement

Teaching Style		Facilitator	Academic Achievement
Facilitator	Pearson Correlation	1.000	0.812**
	Significant (2-tailed)		0.000
	N		320
Academic Achievement	Pearson Correlation	0.812**	1.000
	Significant (2-tailed)	0.000	
	N	320	

** . Correlation is significant at level 0.01 (2-tailed).

IV. CONCLUSIONS

Education is key to the growth and development of a nation. The process of education is not merely delivering discipline of teaching and learning but merely knowledge, skills, and competence. Teaching and learning strategies of the 21st century relate to the various methods used to meet the needs of the teaching and learning goals of the millennium 21. To achieve the ultimate goal of learning the 21st century, teachers play an important role in producing skilled learners. Additionally, teachers need to know the appropriate teaching style to convey to their students. Effective teaching refers to teachers who can bring students to the last desired learning outcome. This research found that expert style, formal authority style, personal models style, facilitators style, and delegator style used by science teachers in the secondary school in Johor. However, the facilitator style is the most often used teaching style by teachers in conducting teaching and learning of science subjects. Besides, the findings of this study show that there is a positive and significant relationship between facilitator style and student academic achievement. It can be concluded that the facilitator style often used as a method of teaching science will increase the academic achievement of students, and vice versa. Based on these findings, it is hoped the teachers, especially in secondary school science teachers learn more about the different teaching styles. This allows the students to do not feel tired when following the teaching and learning activities. Each teaching style has its advantages and disadvantages. However, this study can be a reference for teachers, especially teachers of science in secondary school to use a facilitator teaching style to improve student academic achievement. Further research is proposing to identify the perceptions and knowledge of teachers about Grasha Teaching style.

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REFERENCES

- [1] Ab. Rahim, N. R., Othman, N. Lecturer's (2017). Teaching Style with Student's Achievement in Entrepreneurship and Innovation Basic Course in UKM. Seminar Serantau, 326-332.
- [2] Abdullah, N. S., Sumarwati, S., Abd Aziz, M. I., Ziden, A. A., Razak, N. A., & Jalil, S. A. (2020). Life and career skills amongst technical and vocational education and training (TVET) students. International Journal of Innovation, Creativity and Change, 11 (12): 637-654.
- [3] Alismail, H. A., McGuire, P. 21st Century Standards and Curriculum: Current Research and Practice. Journal of Education and Practice, 2015, 6, 6, 150-154.
- [4] Amiruddin, M. H., Ismail, I. M., Razali, N., Ismail, M. E., Doman, N., Samad, N. A., & Rahim, A. A. A. (2020). The motivation level towards the application of google apps among part-time students: A case study. Journal of Technical Education and Training, 12, 1.
- [5] Baharuddin, A., Subramaniam, M., & Sharifuddin, R. S. (2001). Rekabentuk Perisian Multimedia Kuala Lumpur: Venton

- Publishing.
- [6] Bude Su, Bonk, C. J., Magjuka, R. J., Xiaojing, L., Seung-hee, L. The Importance of Interaction in Web-Based Education: A Program-level Case Study of Online MBA Courses. *Journal of Interactive Online Learning*, 2005, 4, 1, 1-19.
- [7] Chong, S., Cheah, H. M. A Values, Skills and Knowledge Framework for Initial Teacher Preparation Programmes. *Australian Journal of Teacher Education*, 2009, 34, 3, 1-17.
- [8] Ford, J. H., Robinson, J. M., & Wise, M. E. (2016). Adaptation of the Grasha Riechman Student Learning Style Survey and Teaching Style Inventory to assess individual teaching and learning styles in a Quality Improvement Collaborative. *BMC Medical Education*, 16, 252, 1-13.
- [9] Ghani, A., Adnan, M. F., Jemaat, A. K., Ayub, M., Seman, M., Yusak, S. M. Principal Moral Leadership Full boarding schools and Mara Science Lower Colleges: A Comparison. *Journal of Educational Leadership*, 2015, 2, 3, 1-15.
- [10] Grasha, A. F. (1994). A Matter of Style: The Teacher as Expert, Formal Authority, Personal Model, Facilitator and Delegator. *College Teaching*, 42, 4, 142-149.
- [11] Grasha, A. F. (1996). *Teaching with style: A practical guide to enhancing leaning by understanding teaching and learning style*. Pittsburgh: Alliance Publishers.
- [12] Halim, L., Abdul Hamid, M. I., Meerah, T. S., & Osman, K. (2006). Needs of Primary School Science Teachers in the Teaching of Science in Kota Setar District, Kedah. *Journal of Technology*, 44, 13-30.
- [13] Heydarnejad, T., Fatemi, A. H., & Ghonsooly, B. (2017). An Exploration of EFL Teachers' Teaching Styles and Emotions. *Journal of Applied Linguistics and Language Research*, 4, 2, 26-46.
- [14] Ismaon, Z., Iksan, Z., & Othman, N. (2013). Impression of STAD Model Cooperative Learning to Attitudes Towards Mathematics. *Journal of Mathematical Education*, 1, 1, 11-18.
- [15] Meng, E. A. (2003). *Ilmu Pendidikan: Pengetahuan dan Keterampilan Ikhtisas*. Selangor: Penerbitan Fajar Bakti Sdn. Bhd.
- [16] Ministry of Education Malaysia. (2015). *Kurikulum Abad Ke-21*. Bahagian Pembangunan Kurikulum, KPM.
- [17] Nordin, A., Ling, L. H. (2011). Relationship Attitude towards Science Subjects with Basic Concept Mastery of Science Students Form Two. *Journal of Science & Mathematics Educational*, 2, 89-101.
- [18] Shaari, A. S., Yusoff, N. M., Ghazalic, I. M., Osmand, R., & Mohd Dzahir, N. F. (2014). The relationship between lecturers' teaching style and students' academic engagement. *Procedia Social and Behavioral Science*, 118, 10-20.
- [19] Shirazi, S. (2017). Student experience of school science. *International Journal of Science Education*, 39, 14, 1891-1912.
- [20] Sulaiman, H. R., & Muhammad, R. (2010). *Development of Teaching and Learning Software using Computers*. Johor: University of Technology Malaysia.
- [21] Sumarwati, S., Fitriyani, H., Setiaji, F. M. A., Amiruddin, M. H., & Jalil, S. A. (2020). Developing mathematics learning media based on elearning using moodle on geometry subject to improve students' higher order thinking skills. *International Journal of Interactive Mobile Technologies*, 14, 4, 182-191.