The contribution of school climate, achievement motivation, and self-concept to science learning achievement

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Abstract. This research was aimed at investigating the contribution of school climate, achievement motivation and self-concept to science learning achievement in the seventh graders of MTs Al-Khairiyah Tegallanggah in the academic year 2015/2016. The research used the expos facto design. There were 46 seven grade students chosen as the sample. The data on school climate, achievement motivation and self-concept were collected by using questionnaire and the data on learning achievement by using a multiple-choice test. The hypotheses were tested by using simple linear regression and multiple linear regression. The results of the research showed that: 1) there is a positive and significant contribution of school climate to the students’ learning science achievement (\(F = 39.88\) and sig.5%); 2) there is a positive and significant contribution of achievement motivation to students’ learning science achievement (\(F = 31.01\) and sig.5%); 3) there is a positive and significant contribution of self-concept to students’ learning science achievement (\(F = 15.91\) and sig.5%); 4) simultaneously there is a positive and significant contribution of school climate, achievement motivation and self-concept to students’ science learning achievement (\(F = 15.27\) and sig.5%). So, school climate, achievement motivation and self-concept can be predictors of students’ science learning achievement.

1. Introduction
Science education has the same aim and essence as the aim and essence of the national education in general, i.e., (1) to understand ideas produced by science (concepts, models and theories), (2) to understand important issues in philosophy, history and methodology of science, and (3) to use science, in order that the students are capable of doing leadership activities and applying scientific knowledge in their lives [1].

As an effort to achieve the aim of education, the government has set up competence standards that a student should meet. The effort to meet the competence standards of education in Indonesia has been supported by the Regulation of the National Education Minister of the Republic of Indonesia No. 41 of 2007 on Process Standard. The process standard consists of the planning the instructional process, the instructional process implementation, the learning achievement assessment process, and the instructional process supervision. Education is run as the process of enculturation and empowerment of students which take place in the entire course of one’s life. However, in reality, the aim of education has not been achieved optimally.
This can be seen from the result of a research done by PISA-OECD (Programme for International Student Assessment-Organization for Economic Cooperation and Development) in 2009 in which the reading literacy achievement of Indonesian students ranks the 57th, the mathematics, the 61st rank and the science literacy the 60th from 65 countries [2]. The results above show that the achievements of Indonesian children are still low.

One of the factors which cause the low learning achievement is a bad instructional management, viewed from planning, implementation and assessment done by the teachers. The instructional management done by the teachers is not yet prepared maximally. The instructional management is one of the factors that support the development of a good school climate. A bad instructional management causes the students not to pay attention, misbehave and not to do the tasks given by the teacher [3]. If that happens, it is just proper for the teacher to warn those students. The teaching will become meaningful if it is supported by a conducive, constructive and innovative learning condition [4]. This condition will affect and improve achievement and indirectly will create a good social relation. Othman et al., [5] states that the mutualistic social relation between students and teacher is an important element in the school life. Teacher who is interested, caring, fair, democratic, and respectful toward the students is characterized as capable enhancing students’ achievement.

Students will feel that the teacher pays attention to them if the latter is regarded as fair in giving attention to all students. The teaching process will raise the students’ motivation to achieve [3]. Students’ achievement motivation will develop if the teacher gives challenging tasks in the environment which support the acquisition of the material. The teacher has to give emotional and cognitive support, and meaningful and interesting materials to be learned and acquired, and gives enough support to develop students’ autonomy and initiative. According to Kala, et al., [6], achievement motivation is an effort to reach success by competing based on a standard of excellence. The standard of excellence can be in the form of the level of completeness of the result in task performance (related to tasks), in comparison to self-achievement (related to oneself), and in comparison to others (related to others).

Besides being positive in its effect on the students’ academic achievement, school climate contributes positively to nonacademic achievements, such as the development of self-concept, self-belief and aspiration. Othman et al., [5] states that self-concept development is influenced by other people who are close in the environment. There are two factors which influence self-concept, i.e., actor factor (parents, peers and the society) and substance factor (learning, association and motivation).

The end result of the management of school climate, achievement motivation and students’ self-concept is the achievement of an optimal learning process and learning achievement. An optimal learning achievement is the ideal expectation that has to be achieved by a person after undergoing a learning process. In an effort to achieve an optimal learning achievement, according to the planning and expectation in the learning process, the school climate has to meet an adequate condition. In addition, school climate has to enhance achievement motivation and positive self-concept. This is a requirement that has to be met in a school. Based on the explanation above, a research on “the contribution of school climate, achievement motivation and self-concept to science learning achievement of the students of MTs Al-Khairiyah Tegallinggah” was conducted to see the relation between the three variables and learning achievement.

2. Method
This study belonged to an ex post facto research. The population consisted of 64 seventh grade students of MTs Al-Khairiyah Tegallinggah. The sample also consisted of 64 students.

There were two types of variables in this study, i.e., independent variables (school climate, achievement motivation and self-concept) and a dependent variable (science learning achievement). The topic of the lesson was matter and its changes. The study used questionnaire to obtain data on school climate. With the reliability index of 0.909 in the very high classification, another questionnaire to obtain data on achievement motivation with the reliability index of 0.926 in the very high
classification, and another questionnaire to obtain data on self-concept with the reliability index was 0.870 in the very high classification. While to obtain data on learning achievement the study used a multiple choice test a with the reliability index 0.650 in high classification.

The data of this study were analyzed step by step. The steps were data description, assumptions testing, and hypothesis testing. The assumptions testing done consisted of (a) normality testing, (b) linearity testing and significance of regression direction testing, (c) multicollinearity testing, (d) autocorrelation testing, and (e) heterocedasticity testing. If the prerequisites had been met, then it was continued with hypothesis testing using simple linear regression and multiple regression aided by SPSS 16.0 for windows at significance level $\alpha = 0.05$.

3. Results and Discussion

3.1 Description of Data on School Climate, Achievement Motivation, Self-Concept, and Science Learning Achievement

The description of the result of the study on school climate, learning motivation, self-concept and science achievement are presented in table 1 below.

| No | Statistic | $(X_1)$ | $(X_2)$ | $(X_3)$ | $(Y)$ |
|----|-----------|---------|---------|---------|-------|
| 1  | Mean      | 155     | 146.17  | 156.24  | 77    |
| 2  | Median    | 155     | 149     | 160     | 77    |
| 3  | Mode      | 143     | 150     | 163     | 70    |
| 4  | Standard Deviation | 11.78 | 12.46 | 10.33 | 13.69 |
| 5  | Variance  | 138.97  | 155.25  | 106.80  | 187.47|
| 6  | Minimum   | 130     | 123     | 133     | 47    |
| 7  | Maximum   | 184     | 172     | 173     | 100   |
| 8  | Range     | 54      | 49      | 40      | 53    |
| 9  | Total Number of data scores | 7130 | 6724 | 7187 | 3547 |
| 10 | Number of Subjects | 46 | 46 | 46 | 46 |

The result of descriptive analysis shows that the mean for school climate is 155 in high qualification and the mean for achievement motivation is 146.17 in high qualification. The score for students’ self-concept is 173 with the mean = 156.24 in high qualification. The score for science learning achievement of the students of seventh grade of MTs Al-Khairiyah Tegallanggah ranges from 47 to 100 with the mean score of 77 in the high qualification.

3.2 Hypothesis Testing

| No | Inter-variable Correlation | Regression Line Equation | Correlation Coefficient | Contribution (%) | Effective Contribution (%) |
|----|---------------------------|--------------------------|-------------------------|------------------|----------------------------|
| 1  | $X_1$ and $Y$             | $\bar{Y}=36.74 + 0.34 X_1$ | 0.58                    | 40.17            | 34.27                      |
| 2  | $X_2$ and $Y$             | $\bar{Y}=27.58 + 0.28 X_2$ | 0.53                    | 32.78            | 27.96                      |
| 3  | $X_3$ and $Y$             | $\bar{Y}= 34.43 + 0.43 X_3$ | 0.48                    | 27.04            | 23.01                      |
| 4  | $X_1$, $X_2$, $X_3$ and $Y$ | $\bar{Y}=12.44 + 0.26 X_1 + 0.16 X_2 + 0.14X_3$ | 0.92                    | 99.99            | 85.24                      |

Note: Significant and Linear
From the result of the testing of the first hypothesis was found the linear regression equation \( \hat{Y} = 36.74 + 0.34 X_1 \) in which \( F_{\text{obs}} = 39.88 \) (sig.=0.000) so that F is significant, and it can be concluded that the variable of school climate gives a positive effect on the students’ science learning achievement. Thus, the null hypothesis which states that there is “no positive and significant contribution of school climate to science learning achievement” is rejected. This shows that there is a positive and significant contribution of school climate to science learning achievement.

A good school is characterized by a condition of the people in the school who create together a harmonious and conducive atmosphere, obeying the rules consistently, and give appreciation to the people of the school who have a good achievement, both in the academic and nonacademic fields. Due to the significant enough contribution of school climate to science learning achievement, it is a must and a proper thing for the school to always pay attention and create a school condition which enables the students to learn peacefully, and comfortably that in the end the students can enhance their learning achievement in general and in science in particular.

Magen-Nagar et al., [7] states that one of the ways to improve the quality of education that has been mostly studied and practiced is through improving school climate. They have proven that students can reach a better learning achievement when they are in a comfortable, secured, conducive and pleasant school climate. The teachers too can present a good performance, committed to make the school make a better progress and enhance the students’ learning achievement.

From the result of the testing of the second hypothesis was found the linear regression equation \( \hat{Y} = 27.58 + 0.28 X_2 \) in which \( F_{\text{obs}} = 31.01 \) (sig.=0.000) so that F is significant, and it can be concluded that the variable of achievement motivation gives a positive effect on the variable of students’ science learning achievement. Thus, the null hypothesis which states that there is no positive and significant contribution of achievement motivation to science learning achievement is rejected. This shows that there is a positive and significant contribution of achievement motivation to science learning achievement.

This study finding is also in line with the study done by Kala et al., [6] that the students with a high achievement motivation tend to take a mild measured risk, like the work situation that requires personal responsibility, want to increase knowledge about good work procedure, investigate the environment, and use the existing resources and learn in a unique and innovative way. Each student shows an effort to be able to pursue a better learning achievement than their friends in the class.

Winkel [8] states that achievement motivation is the power in an individual to reach the highest possible learning achievement to satisfy his or her drive. Kokila et al., [9] states that achievement motivation is reflected in the orientation toward the goal and dedication in order the goal can be achieved well. Furthermore, it is stated that an individual with a high achievement motivation likes a job which challenges his or her expertise and his or her ability to solve problems. The power of one’s achievement motivation depends on the amount of success expectation. Achievement motivation in this case is defined as a drive to get the result of an activity as well as possible in an effort to reach a goal, an effort to get superiority, and an effort to avoid failure.

From the result of the testing of the third hypothesis was found the linear regression equation \( \hat{Y} = 34.43 + 0.43 X_3 \) in which \( F_{\text{obs}} = 15.91 \) (sig.=0.001) so that F is significant, and it can be concluded that the variable self-concept gives a positive effect on students’ science learning achievement. Thus, the null hypothesis that states that there is no positive and significant contribution to science learning achievement is rejected. This shows that there is a positive and significant contribution of self-concept to science learning achievement.

Human conceptions about him self or herself influences his or her choice of behavior and expectation in his or her life. Djiali [10] believes that self-concept is an individual’s whole perspective about the physical dimension, characteristics, personality, motivation, weaknesses, intelligence, and failure Suarni [11] defines self-concept as a set of expectations, and behavioral assessment that refer to the expectations.
Othman et al., [5] states that the difference in self-concept between high achieving students and low achieving students causes the difference in looking at the achievements they have achieved. The students who look upon themselves negatively take the success that they got just as something that occurs by chance. While, the students who look upon themselves positively will take the success as an indication of their ability. In addition, the students who have a positive self-concept will recognize themselves from the point of view of their weaknesses and strengths so that they can design goals that are suitable for them and in keeping with the reality, thus will be wise in determining their careers toward the future. On the other hand, the students with a negative self-concept will have a pessimistic attitude toward competition so that will hesitate to use their strengths and weaknesses.

From the result of of the testing of the third hypothesis was found the linear regression equation
\[ \hat{Y} = 12.44 + 0.26 X_1 + 0.16 X_2 + 0.14 X_3 \] in which \( F_{\text{obs}} = 15.27 \) (sig. = 0.000) so that \( F \) is significant, thus it can be concluded that simultaneously, the variables of school climate, achievement motivation, and self-concept give a positive effect on students’ science learning achievement. Thus, the null hypothesis which states that there is no positive and significant contribution simultaneously of school climate, achievement motivation, and self-concept to science learning achievement is rejected. This shows that there is a positive and significant contribution simultaneously of school climate, achievement motivation, and self-concept to science learning achievement.

Santrock [3] states that the supporting factors in enhancing learning achievement are school climate, achievement motivation, and self-concept. Suasta [12] states that science naturally, has two dimensions, i.e., science as a process and science as a product. The series of activities or mental processes have to be activated to produce knowledge. To activate it, it needs a strategy that contains procedural meanings known as scientific method, that consists of various mental actions, work patterns, procedures and technical ways to obtain and develop the gain of knowledge.

Student’s success in achieving the goal of learning such as in achieving learning achievement is determined by internal and external factors. The internal factors, i.e., achievement motivation, aptitude, and other intelligence entities. The external factors, i.e., environment, school climate, school system, and the teachers’, parents’ and peers’ motivational powers. One of the factors with the most support to science learning achievement is instructional approach or method implemented by the teacher in the instructional process. Othman et al., [5] states that instructional method is one way which is used by the teacher based on various considerations such as the instructional goal, learner characteristics, facilities and environment that are meant to create conducive learning condition, so that the students can learn joyfully.

An important element which has to be considered in the instructional process is the aspects of school situation and condition.

These aspects and condition of school have play an effective role in giving extrinsic motivation to the students. A good school condition is needed very much since it gives a significant enough effect to the comfort, peace in learning and increases the students’ enthusiasm to learn inside and outside the classroom. The students who learn in a pleasant situation can become more highly motivated to achieve. The orientation of achievement motivation is a drive which comes from oneself to reach success as a reward for achieving something. Besides, school climate actually has a direct contribution to the instructional process at school, in the form of the development of students’ character, which includes among others, the students’ self-concept. Self-concept is a comprehensive view of oneself, both about the personal characteristics, life values, life principles, life values, morality, the weaknesses and potentialities which are formed from experiences and interactions with others which can help the individual in self actualizing himself or herself freely and responsibly in attaining a particular goal as what is expectation.

4. Conclusion

First, there is a positive and significant effect of school climate on science learning achievement in the seventh grades at MTs Al-Khairiyah Tegallingah as shown in the linear regression equation \( \hat{Y} = 36.76 + 0.34 X_1 \) with \( F_{\text{obs.}} = 39.88 \) sig. 5%.
Second, there is a positive and significant effect of achievement motivation on science learning achievement in the seventh graders at MTs Al-Khairiyah Tegallingah as shown in regression linear equation $\hat{Y}=27.58 + 0.28 X_2$ with $F_{obs.}=31.01$ sig. 5%.

Third, there is a positive and significant effect of school climate on science learning achievement in the seventh grades at MTs Al-Khairiyah Tegallingah as shown in the linear regression equation $\hat{Y}=34.43 + 0.43 X_1 \times \text{with } F_{obs.}=15.91$ sig. 5%.

Fourth, there is a positive and significant effect of school climate, achievement motivation, and self-concept on science learning achievement in the seventh grades at MTs Al-Khairiyah Tegallingah as shown in the linear regression equation $\hat{Y}=12.44 + 0.26 + 0.16 X_2 + 0.14 X_3 \times \text{with } F_{obs.}=15.27$ sig. 5%.

In the light of these findings, and discussion, it can be concluded that school climate, achievement motivation, and self-concept give a positive and significant effect simultaneously to the science learning achievement of the students of the seventh grade at MTs Al-Khairiyah Tegallingah both partially and simultaneously.

Based on the findings of this study, some suggestions can be made, among others, the results of this study shows that school climate, achievement motivation, and self-concept can be used as predictors in an effort to enhance the students’ learning achievement.

For this purpose, schools should give support to the creation of a comfortable and conducive school climate through supervising the teachers and the administration staffs at the schools in order they perform their tasks and obligations optimal the role of various parties, i.e., the students, the parents and the teachers, are needed very much. The teachers and parents are expected to act as motivators for the students at school and at home, both in relation to the teaching and learning activities and the parents’ guidance at home. For other researchers who would like to do a study of the same type as this study it is expected that they develop this study further by using a larger sample.

References
[1] Mubarrak L. 2009. The Web-Based Learning Model on Dynamic Fluid Concept to Improve Student’s Science Generic Skills Paper Presented in Proceeding International Seminar on Science Education Universitas Pendidikan Indonesia.
[2] Balitbang 2012 Survei International TIMSS Available at http://litbang.kemdiknas. Net. Accessed on 7th July 2017
[3] Santrock J W 2008 Psikologi Pendidikan: Edisi Kedua (Jakarta: Kencana Prenada Media Group)
[4] Trianto 2010 Mendesain Model Pembelajaran Inovatif, Progresif, Konsep, Landasan, dan Implementasinya pada Kurikulum Tingkat Satuan Pendidikan (KTSP) (Jakarta: Kencana Prenada Media Group)
[5] Othman N and Leng K B 2011 The Relationship between Self-Concept, Intrinsic Motivation, Self-Determination and Academic Achievement among Chinese Primary School Students International Journal of Psychological Studies 3 90-98
[6] Kala P C and Shirlin P 2015 A Study on Achievement Motivation and Socio Economic Status of College Students in Tirunelveli District International Journal of Research Granthaalayah 5 57 - 64
[7] Magen-Nagar N and Azuly D 2016 The Contribution of School Climate and Teaching Quality to the Improvement of Learning Achievements, According to an External Evaluation System Creative Education 7 1773 - 1784
[8] Winkel 1999 Psikologi Pendidikan dan Evaluasi Belajar (Jakarta: Gramedia)
[9] Kokila K and Kalaiselvi 2017 A Study on Achievement Motivation among Higher Secondary School Students in Pudukkottai Educational District International Journal of Informative & Futuristic Research 4 7588 - 7593
[10] Djaali 2011 Psikologi Pendidikan (Jakarta: Bumi Aksara)
[11] Suarni, Ni Ketut. 2004. Meningkatkan Motivasi Beprestasi Siswa Sekolah Menengah Umum di Bali dengan Strategi Pengelolaan Diri Model Yates (Studi Kasus Eksperimental pada Siswa Kelas I SMU di Bali). *Dissertation* (unpublished). Jogjakarta: UGM.

[12] Suastra, I W. 2013. *Pembelajaran Sains Terkini: Mendekatkan Siswa dengan Lingkungan Alamiah dan Sosial Budayanya*. Singaraja: Universitas Pendidikan Ganesha.